

Environmental Assessment
Pentagon Memorial Visitor Education Center, Arlington National
Cemetery



The 9/11 **Pentagon Memorial**



ARLINGTON NATIONAL CEMETERY, ARLINGTON, VIRGINIA
August, 2024

COVER SHEET

Draft

Proposed Action: The Pentagon Memorial Fund proposes to construct and operate a Visitor Education Center for the 9/11 Pentagon Memorial on land located on the grounds of Arlington National Cemetery in Arlington, Virginia. Army National Military Cemeteries (ANMC) proposes to grant a license to the Pentagon Memorial Fund for use of the site.

Type of Document: Environmental Assessment

Lead Agency: Army National Military Cemeteries (ANMC), a Direct Reporting Unit of Headquarters, Department of the Army

Lead Contact: Scott Lonesome
scott.l.lonesome.civ@army.mil

Abstract

The Pentagon Memorial Fund (PMF) proposes to construct and operate a Visitor Education Center (VEC) for the 9/11 Pentagon Memorial on land owned by Army National Military Cemeteries (ANMC) located on the grounds of Arlington National Cemetery (ANC) in Arlington, Virginia. ANMC proposes to grant a license to PMF to construct and operate the VEC.

The site for the proposed Pentagon Memorial VEC is adjacent to the Southern Expansion area of ANC within a 3.71-acre parcel of land bounded by Columbia Pike, East Joyce Street and Washington Boulevard. Approximately 900,000 individuals are projected to visit the 9/11 Pentagon Memorial VEC every year. The facility would be accessible by pedestrians, bicycles, and vehicles with the main ingress/egress points for vehicular traffic for visitors being on Columbia Pike and service vehicles being on S. Joyce Street. The facility would include conferencing space for private functions after hours, in addition to a bookstore and a café.

EA Organization

Chapter 1 includes the Purpose of and Need for the proposed action and provides background and context. Chapter 2 describes the proposed action and alternatives. Chapter 3 outlines the existing conditions and discusses the potential environmental consequences of the proposed action and alternatives and the No Action Alternative. Chapter 4 lists the persons and agencies that were consulted with during the process, and Chapter 5 provides a list of preparers of the EA document.

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Abbreviations And Acronyms

ACHP	Advisory Council on Historic Preservation
AMSL	above mean sea level
ANC	Arlington National Cemetery
ANMC	Army National Military Cemeteries
APE	Area of Potential Effect
AQI	Air Quality Index
AQTR	Air Quality Technical Report
BCC	birds of conservation concern
CAA	Clean Air Act of 1970
CBPA	Chesapeake Bay Preservation Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act of 1977
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Plan
DAR	Defense Access Roads project
DEM	digital elevation model
EA	Environmental Assessment
EIS	Environmental Impact Statement
EISA	Energy Independence and Security Act of 2007
EJ	Environmental Justice
EO	Executive Order
EPA	Environmental Protection Agency
EPAct	Energy Policy Act of 2005
ESA	Endangered Species Act
ESC	Erosion and Sediment Control
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
GHG	Greenhouse Gas
GWP	Global Warming Potential
HCM	Highway Capacity Manual
HQDA	Headquarters, Department of the Army
IAA	instrument approach areas
IPaC	USFWS Information for Planning and Consultation
ISOWPP	Initial Scope of Work Planning Package
LEED	Leadership in Energy and Environmental Design
LID	Low Impact Development
LOD	limits of disturbance
LOS	level of service
MS4	Municipal Separate Storm Sewer System
NAAQS	National Ambient Air Quality Standards
NCA	Noise Control Act
NCO	Noise Control Ordinance

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NCPA	National Capital Planning Commission
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory
OSHA	Occupational Safety and Health Administration
PAH	polycyclic aromatic hydrocarbons
PMF	Pentagon Memorial Fund
RCRA	Resource Conservation and Recovery Act of 1976
RMA	Resource Management Areas
RPA	Resource Protection Areas
SHPO	State Historic Preservation Office
TPY	Tons Per Year
USACE	U.S. Army Corps of Engineers
USBGC	U.S. Green Building Council
UFC	United Facilities Criteria
USFWS	U.S. Fish and Wildlife Service
VaFWIS	Virginia Fish and Wildlife Information Service
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDHR	Virginia Department of Historic Resources
VEC	Visitor Education Center
VIA	Visual Impact Assessment
VPDES	Virginia Pollutant Discharge Elimination System
VSMP	Virginia Stormwater Management Program
WHS	Washington Headquarters Service

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1. Purpose of and Need for the Proposed Action

1.1 Introduction

This Environmental Assessment (EA) serves to evaluate the potential environmental impacts associated with a proposed two-fold federal action. This proposed action includes the 9/11 Pentagon Memorial Fund's (PMF) intent to construct and operate a Visitor Education Center (VEC) for the 9/11 Pentagon Memorial, and Army National Military Cemeteries (ANMC) proposed intent to grant a license that will allow PMF to construct and operate the center on the grounds of Arlington National Cemetery (ANC) (**Figure 1-1, Vicinity Map**), owned by ANMC. **Figure 1-2, Project Site** shows the specific location of the proposed action within the expanded ANC.

The terrorist attacks carried out on September 11, 2001 forever changed our nation. On the morning of September 11, Al-Qaeda terrorists hijacked four airliners while in flight with the intent of crashing them into targets in New York City and Washington, D.C. Three of the four attempts were successful, with one plane crashing into the Pentagon and two crashing into the World Trade Center's North and South Towers. The fourth attempt, reported to target a federal building in Washington, D.C., was thwarted when passengers revolted and the airliner crashed into a field on the outskirts of Shanksville, Pennsylvania.

Visitor Centers have been established in both New York City and Shanksville, Pennsylvania, providing educational exhibitions that tell the story of attacks at the respective locations. While a memorial that honors the 184 lives that were lost as a result of the attack on the Pentagon exists, there is no Visitor Education Center that provides an understanding of the specific events of that day at the Pentagon, the lives lost during the tragic events, and the historic significance of the Pentagon Memorial Site.

This EA follows regulatory guidance of the National Environmental Policy Act (NEPA) of 1969, the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and Environmental Analysis of Army Actions (32 CFR 651), the Army's NEPA regulation. Arlington National Cemetery, a Direct Report Unit of the Headquarters, Department of the Army (HQDA), is the lead agency for the environmental review of the proposed action and would be responsible for granting a license authorizing the use of the proposed site for construction and operation of the proposed VEC. The Pentagon Memorial Fund is the project proponent, and is responsible for funding, designing, constructing, and operating the proposed VEC.

1.2 Purpose of and Need for the Proposed Action

The purpose of the proposed action is to construct and operate a VEC to support visitors of the 9/11 Pentagon Memorial on a 3.71-acre site located in Arlington County, Virginia immediately southwest of the Pentagon and the existing 9/11 Pentagon Memorial. The proposed VEC would provide interactive exhibits and educational programs that would give visitors a sense of the broad impact of the tragedy from a variety of perspectives. Stories of the courage and resilient spirit demonstrated by Pentagon employees, first responders, and residents of the area will be shared throughout the exhibits. The VEC will also provide facilities, including restrooms and a café, that are not currently available to visitors of the Memorial. In addition, the nearest public parking is at Pentagon City, which is one mile to the south, and no access will be provided to the VEC from the ANC due to necessary perimeter security fencing around the ANC. Visitation documented at the Pentagon Memorial each year supports the need for a

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facility designed to serve and educate visitors. In addition to providing details of the 184 individuals who lost their lives on 9/11 and interpretive displays discussing the symbolism of the memorial design, the VEC will offer a dedicated parking area, permanent restrooms, shelter for visitors, a café, bookstore, and event space. To achieve this and be financially sustainable, the building will require a site footprint of between 25,000 and 30,000 square feet to support a program area of between 46,500 and 50,000 square feet, and approximately 100 parking spaces.

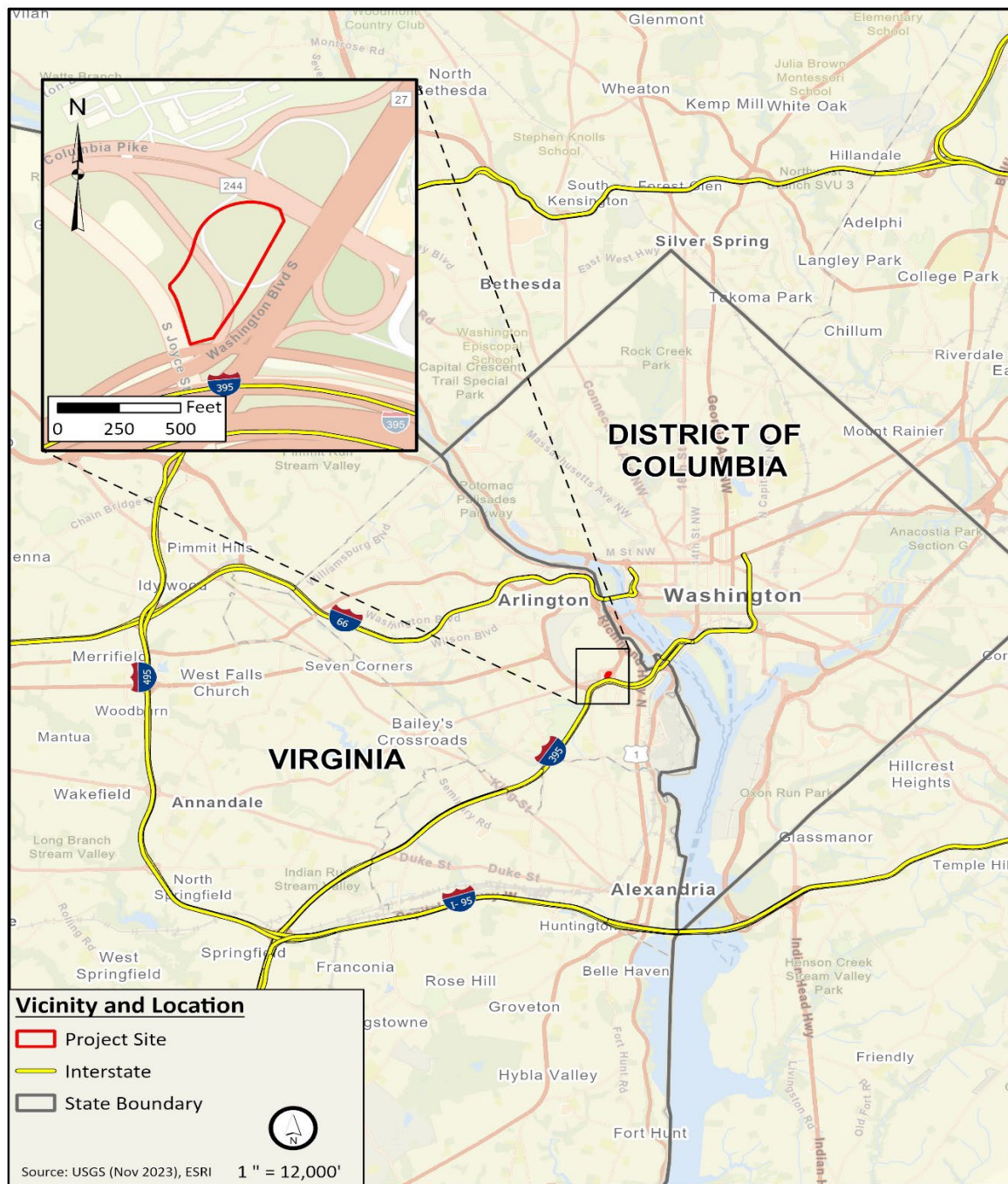


Figure 1-1 – Vicinity and Location of the Pentagon Memorial Fund Visitor Education Center

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Figure 1-2 – Project Site Location

1.3 Scope and Content of the EA

NEPA is a federal statute requiring the identification and analysis of potential environmental impacts associated with proposed federal actions prior to those actions being undertaken by the sponsor agency. NEPA helps agencies make well-informed decisions based on an understanding of the potential environmental consequences for a variety of resource categories. The CEQ was established by NEPA and is responsible for the development of guidance and regulations for implementing the statute, along with federal agencies that implement their own regulations to ensure federal agency compliance with NEPA.

CEQ regulations provide that an EA may be prepared to determine whether the proposed action is a major federal action that significantly affects the quality of the human environment. An EA helps determine whether to prepare a Finding of No Significant Impact (FONSI) or a notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS). The EA assists in an agency's compliance with NEPA when an EIS is unnecessary and facilitates preparation of an EIS if one is required.

This EA addresses whether the proposed action would result in significant impacts. If significant impacts are anticipated, then PMF would decide whether to provide mitigation to reduce impacts below the level of significance, undertake the preparation of an EIS, or abandon the proposed action. The EA will also be used to guide PMF in implementing the proposed action in a manner consistent with federal standards for environmental stewardship should the proposed action be selected for implementation.

The EA evaluates the potential impacts to the existing environment and resources associated with the construction and operation of a VEC. In addition, concepts regarding the site configuration and exterior treatment of the building as well as construction and operations of the proposed VEC facility will be evaluated.

While both the Pentagon Reservation's Master Plan dated 2014 and ANC's Southern Expansion Environmental Assessment dated 2019 referenced the site of the proposed VEC, neither document included an evaluation of environmental impacts associated with use of the land for this purpose. Therefore, this EA will include a description of the proposed action, other alternatives considered, the affected environment, and analysis of environmental consequences. The following sections of this EA will contain detailed evaluations for the following resource areas:

- Land Use
- Air Quality and Greenhouse Gas
- Noise
- Geological and Soil Resources
- Water Resources (including MS4 permits, CZMA, etc.)
- Biological Resources
- Cultural Resources
- Socioeconomics
- Transportation and Traffic
- Airspace
- Utilities
- Hazardous and Toxic Materials
- Hazardous Waste
- Visitor Experience

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Under 40 CFR § 1508.8, NEPA includes requirements for consideration of impacts to cultural resources. Federal agencies are responsible for protecting historic properties defined primarily by Section 106 of the National Historic Preservation Act (NHPA). Section 106 requires federal agencies to account for the effects of their undertakings on historic properties in accordance with 36 CFR Part 800. In addition to Section 106 of the NHPA, cultural resources also may be covered by state, local, and territorial laws. Pursuant to these regulatory and federal policy requirements, ANMC is coordinating with the Virginia State Historic Preservation Office (SHPO).

1.4 Decisions to be Made

Federal agencies are required to incorporate environmental analysis into their decision-making process for any actions that they propose. Such actions include whether to approve a project under the agency's purview, to fund a project, or to implement a project on their own behalf. In deciding whether to proceed with the proposed action, ANMC must meet NEPA requirements.

This EA will thus assist ANMC with its decision-making process by informing decision makers and the public of the potential environmental effects of the proposed action, alternatives that were considered, and methods to reduce identified effects. It will help ANMC determine whether to prepare a FONSI or an EIS, document the affected environment and the environmental consequences of the proposed action, and enable governmental agencies, regulatory agencies, Tribal governments, and the public to provide input into the decision-making process.

The EA will document and summarize actions that the lead agency commits to implement in order to minimize or mitigate adverse effects consistent with NEPA, CEQ regulations, and 32 CFR 651. The EA will inform ANMC as to whether the proposed action will have impacts to the aforementioned environmental resource areas, and whether those impacts are significant. If the EA documents that implementing the proposed action will not have significant environmental impacts with or without mitigation measures, then the agency will issue a FONSI. The FONSI presents the reasons for this decision. Should the EA determine the environmental impacts of the proposed action will be significant even with application of appropriate mitigation measures, then an Environmental Impact Statement may be prepared.

1.5 Scoping and Public Involvement

Prior to development of the EA, 28 governmental and non-governmental agencies were invited to be part of the public scoping process through a series of letters mailed in late 2022. Additionally, public notices of the scoping period and public scoping workshop were posted in *The Washington Times* and *The Washington Post* along with postings on both ANC's website and PMF's website. Copies of materials to be presented at the Public Scoping Workshop were posted on both websites during the public comment period. An open house-style Public Scoping Workshop was held at the ANC Welcome Center on 12 December 2022 from 3:30 p.m. to 5:30 p.m. during which poster boards displaying the project background, purpose and need, NEPA process and current stage of the project in the process, site location, and alternatives were available for review. Thirty people attended the meeting and ANMC, PMF, and consultant staff were available to answer questions and obtain comments. The public had an opportunity to provide written comments during and after the meeting until the public comment period ended on 30 December 2022. Fifty comments were received; those comments and responses to comments may be found in **Appendix A**.

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The most substantive comments were received from the Air Force District of Washington (Air Force), Arlington County Department of Environmental Services (DES), and the National Capital Planning Commission (NCPC). The Air Force's comments focused on specific items that could potentially impact the Air Force Memorial, including noise and aesthetic impacts, traffic flow (including bus, bicycle, and pedestrian), access and parking, continuity and consistency with the Air Force Memorial, and commemoration of the American Airlines Flight 77 flight path as it approached the Pentagon. The DES's comments focused on traffic, parking, and visitation including transit, bicycle, pedestrian, and circulation. NCPC's comments focused on design elements of the VEC with regard to aesthetic treatments and visual impacts, particularly to historic resources, as well as parking and traffic issues. Several comments were received from other regulatory agencies outlining various requirements under their respective purviews.

In accordance with Section 106 of the NHPA, ANMC initiated the Section 106 process with the Virginia Department of Historic Resources (VDHR) on 25 May 2023. As part of the initiation, ANMC provided a recommended Area of Potential Effects (APE); a package including a project description, identification of consulting parties, identification of historic properties, and a draft Visual Impact Assessment (VIA); and, requested concurrence on the APE, consulting party list, and findings of the VIA. VDHR responded on 27 June 2023, providing concurrence on the APE, historic properties, and consulting parties list, but deferred concurrence on the visual effects until the consulting parties (described below) had an opportunity to provide comments.

Subsequent to VDHR's response, ANMC engaged the consulting parties, including seven governmental agencies, six non-governmental agencies, and 17 Native American tribes via letters distributed on 4 August 2023, inviting them to be consulting parties and providing them with information for a Consulting Party Meeting as well as information available for review. Additionally, public notices of the Consulting Party Meeting were posted in *The Washington Times*, *The Washington Post*, and *El Tiempo Latino* along with postings on both ANC's and PMF's website. The Consulting Party Meeting was held at MGAC's offices at 730 11th Street, NW, Washington, D.C. on 6 September 2023 from 5:30 p.m. to 7:30 p.m. The meeting was also available to attend virtually, via Microsoft Teams. Information presented during the meeting included a project overview, design alternatives, Section 106 process, and findings of the VIA. Thirty-one people attended the meeting (in-person and virtual) and ANMC, PMF, and consultant staff were available to answer questions and obtain comments. The consulting parties also had an opportunity to provide written comments during and after the meeting until the comment period ended on 20 September 2023. Twenty-two comments were received during the first comment period. In response to these comments, a secondary comment period was initiated with updated documentation to support the VIA, and an additional 11 consulting parties were invited to participate in the Section 106 process. These parties were invited via letters sent on 29 November 2023 and 13 comments were received. Comments and responses received during the first and second comment periods may be found in **Appendix A**.

Substantive comments received as a part of the two public comment periods were received from the Air Force and the National Park Service (NPS). AFDW's comments from both periods were concerned with items that would have the potential to impact the Air Force Memorial, including elements like the potential noise and aesthetic impacts, access and parking, connection to the Air Force Memorial from the VEC, and commemoration of the American Airlines Flight 77 flight path. Comments from the NPS

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were made that involved potential visual impacts to historic resources within the ANC boundaries, and the recommendation for interpretation about the historic communities that lived on the project site as a part of the VEC design. Other comments received during the comment periods were regarding consulting parties who wanted to participate as well as request additional consulting parties be included in the Section 106 process.

1.6 Required Regulatory Review and Consultations

The proposed action requires compliance with federal and state laws and regulations, including the following:

- Clean Air Act (CAA) of 1970 – The EA will determine whether a Clean Air Act conformity determination is required.
- Clean Water Act of 1977 (CWA) – The CWA forms the basis of efforts to control pollution of the waters of the U.S., including wetlands. Under the CWA, discharges of pollutants into navigable waters, either directly or indirectly, are permitted through the National Pollutant Discharge Elimination System (NPDES). The EA will determine whether discharges can be handled under an existing permit.
- NHPA – The Advisory Council on Historic Preservation (ACHP) and the VDHR are the agencies responsible for promoting the preservation of archaeological and historic sites. Under this Act, eligible or listed National Register of Historic Places sites are evaluated for possible impacts from federal actions. ANMC is the lead agency responsible for compliance with Section 106 of the act, requiring consultation and avoidance or mitigation of adverse effects to historic properties.
- Resource Conservation and Recovery Act of 1976 (RCRA) – This federal law requires identification of hazardous waste, standards for management, and the provision of guidelines and financial aid to establish state waste management programs.
- Virginia Coastal Zone Management Program – A Coastal Zone Consistency Determination is required and it will be reviewed by the Virginia Department of Environmental Quality (VDEQ).
- Virginia Stormwater Management Act – The VDEQ is the state agency responsible for approving the Construction General Permit for activities equal to or larger than one acre. The expanded section of the cemetery would fall under ANC's existing Municipal Separate Storm Sewer System (MS4) permit and the proposed County rights-of-way would fall under Arlington County's MS4 permit.
- Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* – The EO directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law.
- Executive Order (EO) 14096, *Revitalizing Our Nation's Commitment to Environmental Justice for All* - This EO builds upon EO 12898, requiring the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in

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agency decision-making so that people are fully protected from disproportionate and adverse human health and environmental effects including risks and hazards related to climate change and that people have equitable access to a healthy, sustainable, and resilient environment.

- EO 13045, Protection of Children from Environmental Health Risks – The EO directs federal agencies to ensure that its policies, programs, activities, and standards address disproportionate environmental health and safety risks to children, to the extent permitted by law.
- EO 13693, Planning for Federal Sustainability in the Next Decade – requires federal agencies to maintain leadership in sustainability and greenhouse gas emission reductions and support preparations for the impacts of climate change.

In addition, the following coordinations or consultations are required:

- Agreements with Washington Headquarters Service (WHS).
- Approval of the building design by the Commission of Fine Arts (CFA) and from the National Capital Planning Commission (NCPC), in accordance with Section 5 of the National Capital Planning Act and Army Regulations (AR) 210-20.
- Consultation with the U.S. Fish and Wildlife Service (USFWS) per Section 7 of the Endangered Species Act (ESA) for actions that may affect a listed species or designated critical habitat.

2. Description of Proposed Action and Alternatives

This section provides a description of the proposed action and the alternatives considered for implementation, including the No Action Alternative. The NEPA process evaluates potential environmental consequences related to a proposed action and considers alternatives to the proposed action. Reasonable alternatives to the proposed action must satisfy the purpose of and need for a proposed action, as presented in Section 1.2. NEPA regulations also require the inclusion of a No Action Alternative against which potential impacts to various resources can be compared.

2.1 Proposed Action

PMF proposes to construct and operate a VEC for the 9/11 Pentagon Memorial on land located on the grounds of Arlington National Cemetery in Arlington, Virginia and that is located to the southwest of the existing memorial. ANMC would provide a license to PMF for use of the site.

2.2 Alternatives Considered

To be considered a reasonable alternative to the proposed action, an alternative must be capable of implementation and must satisfy the purpose of and need for the proposed action. Including alternative actions in an effects analysis provides the opportunity to consider whether a less impactful alternative exists that is equally feasible to implement and that satisfies the purpose of and need for the project.

For all of the alternatives, the Pentagon Metro Station is the closest public transit station for the proposed VEC. The station is located adjacent to the southeast-facing side of the Pentagon and is less than a one-half mile walk to the proposed VEC. Visitor and service vehicular access from S. Joyce Street would be right-in and right-out only, and visitor vehicular access along the realigned Columbia Pike

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would be right-in and right-out only. **Figure 2-1**, below, depicts the pedestrian circulation from the VEC to the Memorial; this would be similar for each of the build alternatives.

NOTE: in the alternative descriptions below, “height” refers to the distance between the ground and the specific part of the building being described; “elevation” refers to the elevation above sea level.

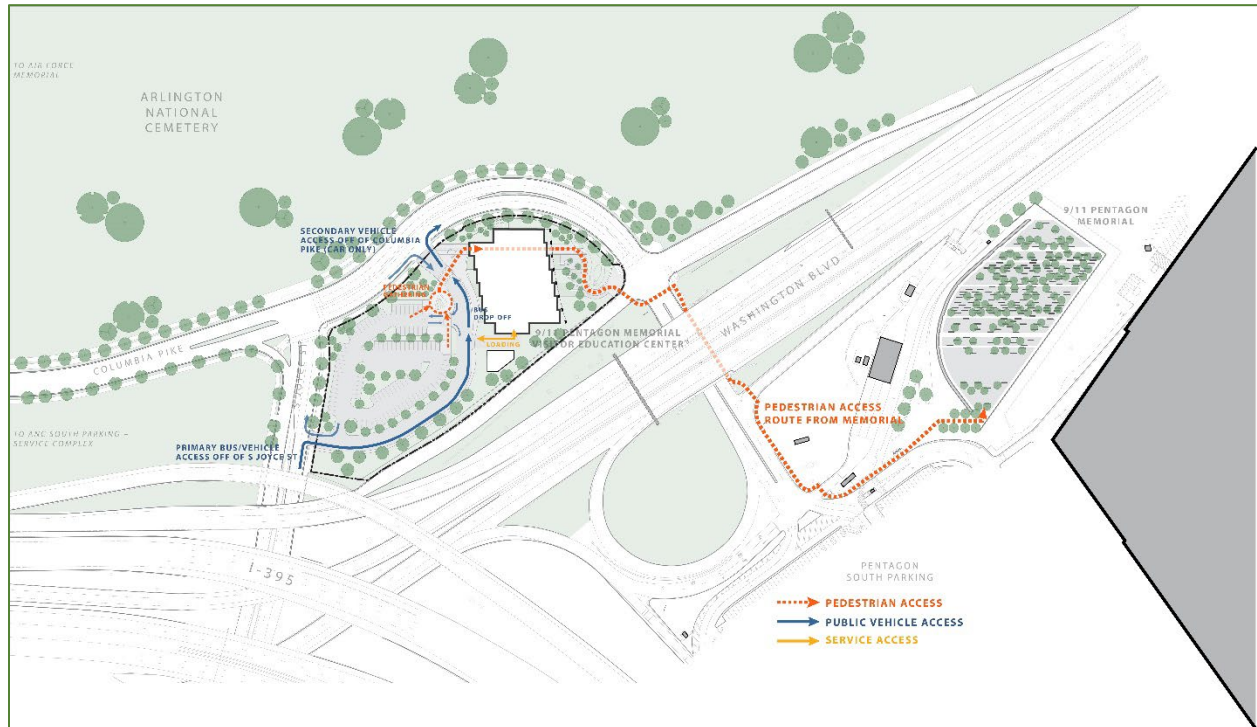


Figure 2-1 – Pedestrian Circulation Map

2.2.1 Alternative 1

Alternative 1 locates the VEC at the high end of the site to the south, which allows for direct visitor access into and out of the exhibit space on the first floor from the parking lot. This also provides the best service entrance off S. Joyce Street, and the main vehicular entrance off the realigned Columbia Pike. The structure is oriented towards the Memorial and its first floor is the same elevation as the vehicular entry (approximately 50'-0"), meaning that the building's south facing facades are constructed with a berm into the hill of approximately 14 feet, diminishing the structure's height by nearly half. At its tallest point, the maximum elevation of the building under this alternative is 105'-0". The first floor is dedicated to the exhibition spaces and a bookstore; the second floor includes conferencing space, a café, and administrative offices. A surface parking lot provides necessary vehicular parking and a bus drop off area for visitors and guests. **Figure 2-2** below shows renderings of the site plan view and front and rear building facades of this alternative.

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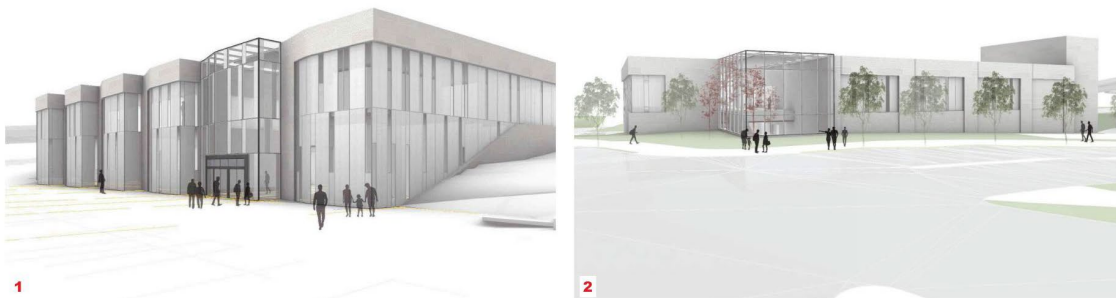


Figure 2-2. Alternative 1

Top: Site plan view. Bottom left: Front façade. Bottom right: Rear façade.

2.2.2 Alternative 2

Alternative 2 is similar to Alternative 1 with the addition of a third floor. The first floor elevation of the building is approximately 54'-0", which is four feet above the curb cut vehicular entrance. The third floor includes a rooftop observation terrace which provides visitors with a visual connection to the Pentagon as well as a place for quiet reflection. The maximum elevation of the building under this alternative is 126'-0", resulting in this being the tallest alternative. **Figure 2-3** below shows renderings of the site plan view and front and rear building facades of this alternative.

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Figure 2-3. Alternative 2.

Top: Site plan view. Bottom left: Front façade. Bottom right: Rear façade.

2.2.3 Alternative 3 (Preferred Alternative)

Alternative 3 locates the VEC at the low end of the site to the north, requiring that the building have two fronts, one from the southern parking area and the other from the north (in the direction of the Memorial). The structure is oriented towards both the Memorial and the parking area. The lower level is dedicated to the exhibition spaces and a bookstore and is on grade at the north end; the upper level provides the main entrance off the south parking and includes conferencing space, a café, and administrative offices. The height of the building at the first floor is approximately 36'-0" and the maximum elevation of the building under this alternative is 91'-0", resulting in this being the alternative with the lowest elevation. From the parking area, visitors would enter the upper level and proceed

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down to the lower level to access the exhibit space and ultimately the Memorial. This alternative provides a more direct procession through the site and with the Memorial.

Figure 2-4 below shows renderings of the site plan view and front and rear building facades of the Preferred Alternative.



Figure 2-4. Alternative 3

Top: Site plan view. Bottom left: Front façade. Bottom right: Rear façade.

2.2.4 Alternative 4

Alternative 4 locates the VEC at the high end of the site to the south and is similar to Alternative 2 but with the introduction of a split-level lobby with a lower level below for the exhibit spaces; an at-grade split level for a bookstore; an upper floor for conferencing space, a café, and administrative offices; and a rooftop observation terrace to provide visitors a visual connection to the Pentagon as well as a place for quiet reflection. This alternative is close to the same height as Alternative 1 but would require all

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visitors to descend to the lower level, creating a burden on stairs, elevators, and potentially costs associated with excavation, waterproofing, and an escalator. The site plan view and front and rear building facades are similar to those shown on **Figure 2-3** above; however, the building included in this alternative would be constructed with a berm into the ground to allow for a lower building as compared to Alternative 2. **Figure 2-5** below shows a rendering of the front building facade of this alternative.



Figure 2-5. Alternative 4 - Front façade.

2.2.5 No Action Alternative

Consideration of a No Action Alternative is a requirement of NEPA regulations. The No Action Alternative serves as a baseline against which potential environmental impacts of action alternatives can be assessed. Under the No Action Alternative, ANMC would not provide a license for construction and operation of the VEC, PMF would not construct the VEC on land owned by ANMC, and in-depth details of the historic significance of the 9/11 attack on the Pentagon and the lives that were lost there would not be available to visitors of the Pentagon Memorial.

Should the No Action Alternative be implemented, the undeveloped land would remain available for future uses, such as for new visitor services or additional operational support for ANC. It would not be used for interment purposes, as it is not contiguous with the ANC.

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2.2.6 Alternatives Considered and Eliminated

2.2.6.1 - Construct VEC in northern cloverleaf adjacent to realigned Columbia Pike – This site was originally proposed but is no longer feasible as ANMC is retaining this area for future burials as part of the Southern Expansion project.

2.2.6.2 - Procure other land for construction of VEC – No other suitable land is available in close proximity to the Pentagon Memorial, which is essential for the VEC to be meaningful to visitors of the site. There is no land available on or adjacent to the Pentagon south parking lot that could be allotted to the VEC; this lot is a secured lot and Pentagon Memorial visitors are not permitted to park there and are thus encouraged to park near the Pentagon City mall. This is the fundamental reason why the VEC is providing surface parking, as it will alleviate parking concerns and provide access to both the VEC and the Memorial.

2.2.6.3 – Provide a small structure for a rest stop and build a designated parking area without providing a larger building for educational exhibits – It was determined that an option including only bathrooms, vending machines, and parking would not be sufficient to accommodate the number of visitors currently documented or anticipated at the Memorial each year. To exclude the construction of a VEC would fail to provide visitors with sufficient support facilities and, especially, fail to provide the education experience that visitors expect at a memorial site. Therefore, this alternative would not meet the purpose and need for the project.

2.2.6.4 – Construct a VEC that is significantly smaller than the buildings proposed under Alternatives 1-4. A smaller building would not be sufficient to provide support facilities and educational exhibits for the anticipated number of visitors and, therefore, would not meet the purpose and need for the project.

3. Affected Environment and Environmental Consequences

This chapter describes the affected environment and baseline conditions for each resource that is deemed relevant, in order to assist the public, stakeholders, and decision makers in comparing potential effects of implementing each of the alternatives contemplated in this document. Following the baseline conditions discussion, the potential environmental consequences of each alternative on the subject resource are discussed.

All potentially relevant environmental resource areas were initially considered for analysis in this EA. In compliance with NEPA, CEQ, and Army requirements, the discussion of the affected environment (i.e., existing or baseline conditions) focuses on resource areas potentially subject to impacts. The level of detail used in describing a resource is proportionate with the expected level of potential environmental impact.

For most resources, the study area is defined as the limits of disturbance (LOD) for each alternative; however, expanded study areas (or areas of potential effect) were established for impacts to socioeconomic resources, noise-sensitive land uses, and historic/cultural resources.

In this analysis, both the setting and severity of impacts are considered because the level of severity deemed significant could differ based on setting. For instance, the threshold of significance for visual impacts would likely be different in a highly urbanized area compared to a historic site in a rural area.

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In NEPA analyses, where the potential issues, concerns, or risks to resources are considered absent, the level of analysis required is very low. In this EA, those resources for which the level of analyses was deemed very low are geological and soil resources, electromagnetic spectrum, and human health and safety.

NOTE: Much of the discussion of the affected environment and the potential environmental consequences to the various resources contained in this chapter was detailed in the Southern Expansion EA and is summarized and/or referenced due to the substantial subject matter overlap relative to the two projects. This is the process called tiering and is authorized under the CEQ's regulation at 40 CFR 1501.11. The proposed action was included in the cumulative impacts section of the Southern Expansion EA.

3.1 Land Use

3.1.1 Affected Environment

Known as the human use of land, land use is recognized as either public or private and is representative of the economic and cultural activities encompassing a given area. Categories of land use include but are not limited to agricultural, urban, residential, and commercial. The determination of use can change over time with development and/or natural events which, in turn, will have a repercussive effect on surrounding resources such as air and water quality, noise pollution, waste generation, wildlife habitat, and overall environmental health. For this reason, development must be sustainable.

Sustainable development is defined by the 1987 United Nation's Brundtland Commission's report as "development which meets the needs of current generations without compromising the ability of future generations to meet their own needs." Emphasizing the importance of protecting natural resources and the environment, sustainable development is an integral part of planning, designing, building, operating, and maintaining facilities among all involved. The federal government has established several legislative and executive actions since 1987 in order to achieve sustainability status. Some of these laws include Energy Policy Act of 2005 (EPAct), Energy Independence and Security Act of 2007 (EISA), and EO 13834 which directs agencies to reduce waste, optimize energy and environmental performance, and cut costs.

The proposed project area is approximately 3.71 acres located in Arlington County, Virginia. All alternatives being considered in the EA assume that the roadway re-alignment occurring under the ANC Southern Expansion and DAR projects will be completed prior to final design and construction of the VEC. Per the Southern Expansion EA, "In its current configuration..., the Southern Expansion site consists of three noncontiguous parcels owned by the federal government, under ANMC jurisdiction, and the land surrounding the roadways of the Washington Boulevard interchange owned by VDOT. The parcels are divided by public roadways, two of them owned by Arlington County (Southgate Road and Columbia Pike) and one owned by VDOT (Washington Boulevard/ Columbia Pike interchange). The [Southern Expansion] proposed action is to make the Southern Expansion contiguous with the cemetery and maximize its interment/inurnment capacity. It would create a single contiguous parcel to increase burial capacity while providing for adequate access, operational capacity, and safety for roadways and ramps affected by the [Southern Expansion] proposed action."

When construction under the Southern Expansion has been completed in the area, the entire site identified for the construction and operation of the VEC will be located within the bounds of Arlington

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National Cemetery, adjacent to Route 27 / South Washington Boulevard as illustrated earlier in **Figure 1-2**.

All areas to the north and west of the project area consist of ANC facilities and interment space. The Pentagon and the 9/11 Pentagon Memorial are located to the east and northeast across Route 27. Areas in the northeast, east, and south of the project area are currently developed, primarily as residential land.

The project area itself is located within the grounds of a government facility, with the associated land use category of government / community facility. The area surrounding the project area is either similarly categorized as government / community facility or is categorized as residential (see **Figure 3-1, Land Use**).

The site of the proposed VEC is zoned S-3A, Special Districts by Arlington County. The proposed VEC would be considered a permitted use under Section 3.A.3 of the County's Zoning ordinance as "Public buildings and properties of a cultural, recreational administrative or service type, including libraries, fire stations, museums and art galleries but not including repair garages, storage or repair yards or warehouses." Generally, local zoning requirements do not apply to federally-owned land.

Exceedance of the threshold of significance for land use and zoning impacts would result from an alternative conflicting with the existing and proposed land uses.

3.1.2 Environmental Consequences

3.1.2.1 Alternatives 1, 2, 3 (Preferred), and 4

The potential impacts to land use for each of the build alternatives would be similar due to each build alternative having similar-sized building and parking footprints, even though their configurations would be slightly different. Thus, they are analyzed in this combined section.

The implementation of any build alternative would be compatible with existing land use within and adjacent to the project area. As the selection of the project area and the design of the VEC have been carried out with the assumption that the Southern Expansion project will be completed prior to the implementation of the proposed action, the area in question is already designated for use as a government facility. While the VEC will be constructed and operated by a private party, the land will be licensed by ANMC. The construction and operation of the VEC would not require any changes to current land use designations, and, therefore, no impacts to land use would be anticipated.

3.1.2.2 No Action Alternative

Under the No Action Alternative, no change to designated land use in this area would be anticipated. The land would remain open for other ANC uses, such as additional interment space or future ANC facilities.

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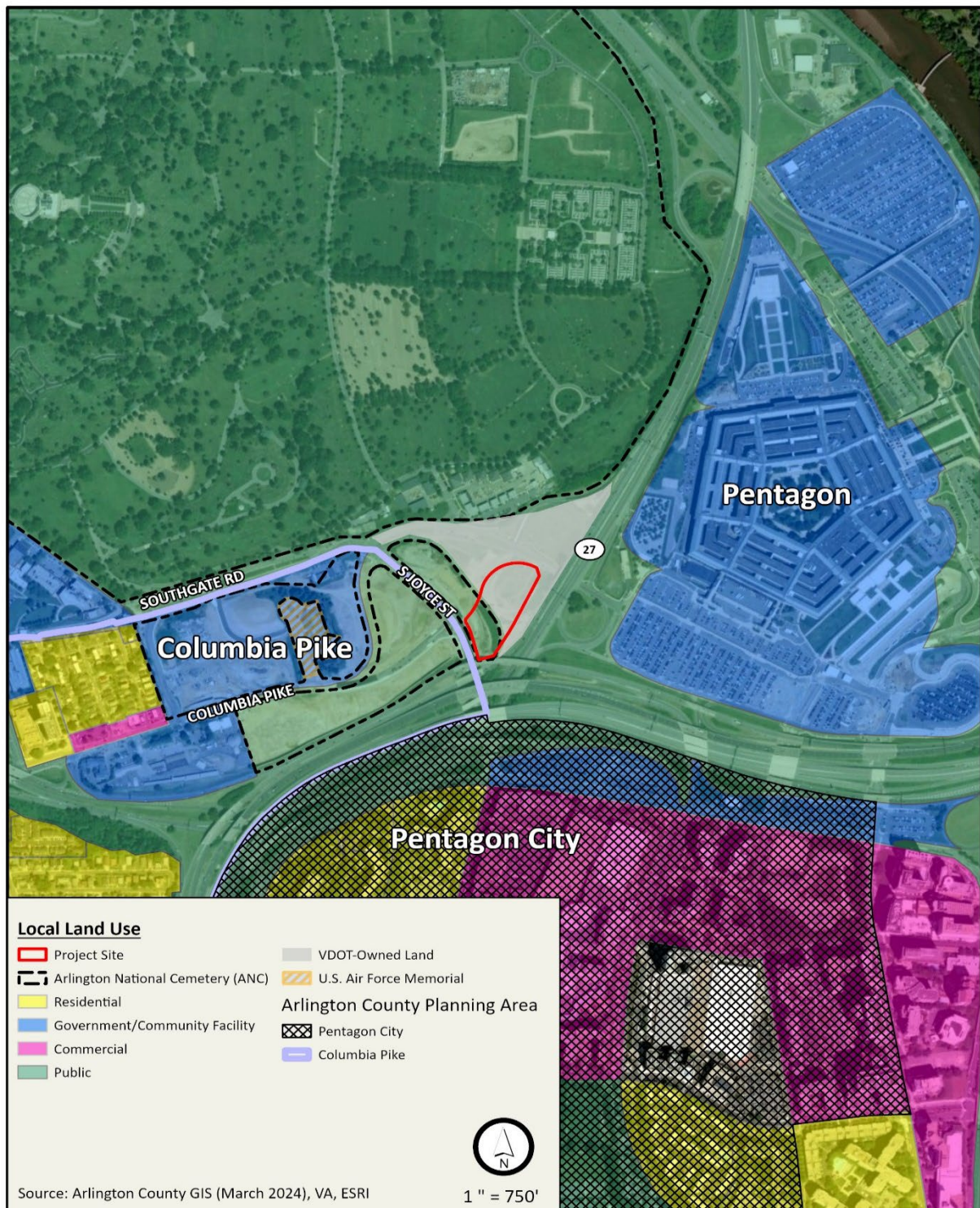


Figure 3-1 – Land Use in the Vicinity of the Project Site

Note: When the PMF VEC is built, the entire Project Site will be owned by ANC after the VDOT-owned land is transferred to ANC.

3.2 Air Quality and Greenhouse Gas

Note: much of the information in this Section 3.2 is summarized from the Air Quality Technical Report (AQTR), dated October 2023, that was prepared by Straughan Environmental, Inc. and is included as Appendix B and incorporated by reference into this section. The AQTR discusses in detail the methodology used for determining construction, commuter, operations emissions, and greenhouse gas emissions that were used to determine the environmental consequences of the alternatives.

3.2.1 Affected Environment

Air quality refers to the concentration of pollutants in the air column at a given location, and their comparison to standards established by the Federal Clean Air Act of 1970 (CAA). In accordance with the CAA, the U.S. EPA has established National Ambient Air Quality Standards (NAAQS) to define outdoor levels of air pollutants that are considered safe for public health, welfare, and the environment. The NAAQS for outdoor concentrations of “criteria” pollutants include carbon monoxide (CO), nitrogen dioxide (NO₂), Ozone (O₃), sulfur dioxide (SO₂), lead (Pb), and particulate matter (PM) with diameters of 2.5 or 10 microns and less (PM_{2.5/10}).

Described using the Air Quality Index (AQI), air quality in a particular location or region ranges from good to hazardous, with good presenting little or no risk and hazardous affecting the health of an entire community. AQI is determined by the concentrations of the six major air pollutants identified above.

Greenhouse Gas (GHG) emissions result from the combustion of fuel that produces emissions of CO₂ (carbon dioxide), CH₄ (methane), and N₂O (nitrous oxide). GHGs are usually presented as CO₂ equivalent or “CO_{2e},” which is based on the specific Global Warming Potential (GWP). Heavy duty vehicles (trucks) contribute significantly to global air pollution and are the largest mobile source of NO_x, and the second largest source of GHG emissions in the transportation sector.

Areas where concentrations of criteria pollutants are below the NAAQS are designated by the EPA as being in “attainment,” and areas where a criteria pollutant level exceeds the NAAQS are designated as being in “nonattainment.” Further, O₃ nonattainment areas are categorized based on the severity of nonattainment: marginal, moderate, serious, severe, or extreme. CO and PM₁₀ nonattainment areas are categorized as moderate or serious.

Arlington County, included within the Metro Washington Air Quality Committee Region, is considered to be in attainment with NAAQS for NO₂, SO₂, PB, PM₁₀, and PM_{2.5}, meaning that outdoor concentrations are below the thresholds set by the EPA. The primary precursors to O₃ development are NO_x and Volatile Organic Compounds (VOCs). As a result, the NO_x and PM_{2.5} NAAQS limits are 100 tons/year, respectively. The region has been given a moderate nonattainment status for O₃ under the 2015 8-hour standard and is classified as a “maintenance area” for CO, meaning the area was historically given a nonattainment status for CO but is now consistently meeting NAAQS.

Title 1, Section 176 (c) (1) of the CAA defines conformity as the upholding of “an implementation plan’s purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving attainment of such standards.” Conforming activities or actions should not, through additional air pollutant emissions,

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- Cause or contribute to new violations of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS; or
- Delay timely attainment of any NAAQS or interim emission reductions.

Projects with annual total emissions from direct and indirect emissions less than the *de minimis* thresholds are not considered to be significant and do not require a general conformity determination. The proposed area reviewed for this study evaluated emissions resulting from construction and forecast transportation modes emissions resulting from operation of the 9/11 Pentagon Memorial VEC.

There is not a threshold emission limit for GHG reporting for mobile sources at this time. For stationary sources, the EPA's *Mandatory Reporting of Greenhouse Gases Rule* requires large sources and suppliers in the United States to report GHG emissions annually. 40 CFR part 98, which applies to direct greenhouse gas emitters, fossil fuel suppliers, industrial gas suppliers, and facilities that inject CO₂ underground for sequestration or other reasons, generally requires that such organizations report their GHG emissions if they exceed 25,000 metric tons or more of CO_{2e} per year. Such reporting is done at the facility level, with exceptions for some suppliers of fossil fuels and industrial GHGs.

3.2.2 Environmental Consequences

3.2.2.1 Alternatives 1, 2, 3 (Preferred), and 4

Potential impacts to air quality for each of the build alternatives would be similar and thus are analyzed in this combined section.

Table 1, below (taken from the AQTR), summarizes the projected emissions for any of the build alternatives. This includes project emissions from construction equipment, construction commuters, construction hauling, and operations emissions of the building. Temporary, short-term impacts to localized air quality may be expected during construction of the VEC, although any observable impacts would be minor in nature. The *de minimis* emissions threshold for NO_x, CO, SO₂, and PM_{2.5} are 100 tons per year (TPY). For O₃, the threshold is 100 TYP for areas that have a moderate nonattainment status. If a project exceeds these thresholds, a general conformity determination is required to be completed for the project. Neither construction nor operations emissions are anticipated to exceed *de minimis* thresholds and, therefore, the project is exempt from a general conformity determination and further air quality review.

The annual CO₂ emissions associated with the construction activities range from 138 to 397 TPY, while the CO₂ emissions associated with operations would be around 6,726 TPY. Though there are no threshold emission limits required for GHG reporting for mobile sources, this amount is far less than the 25,000 TPY threshold for stationary sources.

The conclusion of the AQTR is that, because the emissions do not exceed any of the threshold limits for the criteria pollutants for the proposed area, no mitigation measures are required for the project. Based on the project scope and operations, the emissions associated with the construction and vehicle operations (commuter cars and buses) for visitation to the new 9/11 Pentagon Memorial VEC would not be a significant source of air pollution within the Washington metropolitan area.

Table 1 – Summary of Emissions for Proposed Action

Emissions Type	SO ₂ Total	CO Total	NO _x Total	PM Total	CO ₂ Total
	(TPY)	(TPY)	(TPY)	(TPY)	(TPY)
Construction Equipment Emissions	3.97E-03	0.16	0.01	1.52E-04	257
Construction Commuter Emissions*	-	3.89	0.06	-	397
Construction Hauling Emissions	3.80E-04	0.14	0.3	0.01	138
Operations Emissions	0.007	60.36	2.46	0.038	6727
Total Emissions for Air Pollutants					
Assumptions					
* No emissions from SO ₂ and PM for gasoline vehicles, emissions apply only to diesel engines					
5% of passenger vehicles contain diesel engines					
VEC will be open 359 days per year					
Most staff commute avg. 30 miles one-way to work					

3.2.2.2 No Action Alternative

Under the No Action Alternative, there would be no development on-site associated with any planned VEC and outdoor levels of air pollutants would be anticipated to remain unchanged from existing conditions. If the VEC is not constructed in this area, it is possible that the site would be used for future development of governmental facilities, which may result in similar levels of temporary, construction-associated air quality impacts.

3.3 Noise

3.3.1 Affected Environment

Ineffectively regulated noise, particularly in urbanized areas, poses a growing threat to the health and welfare of the general population. Transportation vehicles, equipment, and machinery contribute to major sources of noise pollution. The national policy to promote an environment for all Americans to be free from noise jeopardizing their health and welfare was established as the Noise Control Act (NCA) of 1972. Additionally, Arlington County instituted a Noise Control Ordinance (NCO) to ensure the health, safety, and welfare of its inhabitants. Regulations in the NCO limit construction noise levels during daytime hours to 90 decibels (dBA) for specific land uses.

When the Southern Expansion project is completed, the proposed site for the VEC will be an open grass area. In that condition, existing noise generated from on-site sources would be minimal or non-existent, and typical for surrounding land uses that are similar. Current noise sources from within the cemetery include routine maintenance operations, vehicles, and burial services. The current environment is also subject to noise sources that emanate from areas adjacent to or outside the project area, such as traffic from nearby highways, aircraft traffic, and occasional noise from other nearby government facilities. Traffic noise affecting the project area is generated predominantly by vehicles traveling on I-395, Washington Boulevard (Route 27), and Columbia Pike. Aircraft noise is generated primarily from air traffic associated with the Ronald Reagan Washington National Airport, located less than a mile to the

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southeast, as well as helicopter traffic that is common along the I-395 corridor due to close proximity to the Pentagon, other U.S. Government buildings, and military installations. The nearest residential area (the Arlington View neighborhood) is located over one-half mile away to the southwest and is isolated from the project area by the I-395 and Route 27 highways.

3.3.2 Environmental Consequences

3.3.2.1 Alternatives 1, 2, 3 (Preferred), and 4

Potential impacts to noise for each of the build alternatives would be similar and thus are analyzed together in this combined section. Noise associated with the operation of the VEC will primarily be generated by visitors' vehicles arriving at and departing from the parking lot, and secondarily by maintenance activities such as mowing, leaf blowing, etc. as well as backup alarms associated with delivery trucks and waste pickup activities. Most of these noise sources would be minor and characteristic of the surrounding area, and too far from the nearest residential areas (> 0.5 mile) to be audible in those areas; however, deliveries and waste pickup activities will be restricted to off-peak hours to minimize those effects as much as possible. The proposed action is thus not expected to create substantial long-term construction noise impacts nor is expected to cause an increase in noise levels during operation of the proposed VEC. The project area is immediately adjacent to both Route 27 and I-395 and is thus located within the substantial noise shadow of those two highways, making it difficult to differentiate noise generated at the VEC from the noise generated by the adjacent highways. Moreover, during construction, noise levels will be limited by the Arlington County NCO if they are able to be adequately isolated and measured separately from the adjacent highway noise. The proposed action is, therefore, not expected to be a significant generator of noise.

3.3.2.2 No Action Alternative

Under the No Action Alternative, there would be no development on-site associated with any planned VEC and, as a result, noise levels would be anticipated to remain unchanged from existing conditions. If the VEC is not constructed in this location, it is possible the site would be used for future development of governmental facilities, which may result in similar levels of temporary, construction-associated noise increases which would not be significant, similar to the build alternatives.

3.4 Geological and Soil Resources

3.4.1 Affected Environment

As demonstrated in **Figure 3-2, Topography**, the topography surrounding the project area slopes generally from west to east, with the topography within the project area sloping slightly from southwest to northeast. The highest point of the project area is approximately 50-75 feet above mean sea level (AMSL), and the lowest point is approximately 25-50 feet AMSL.

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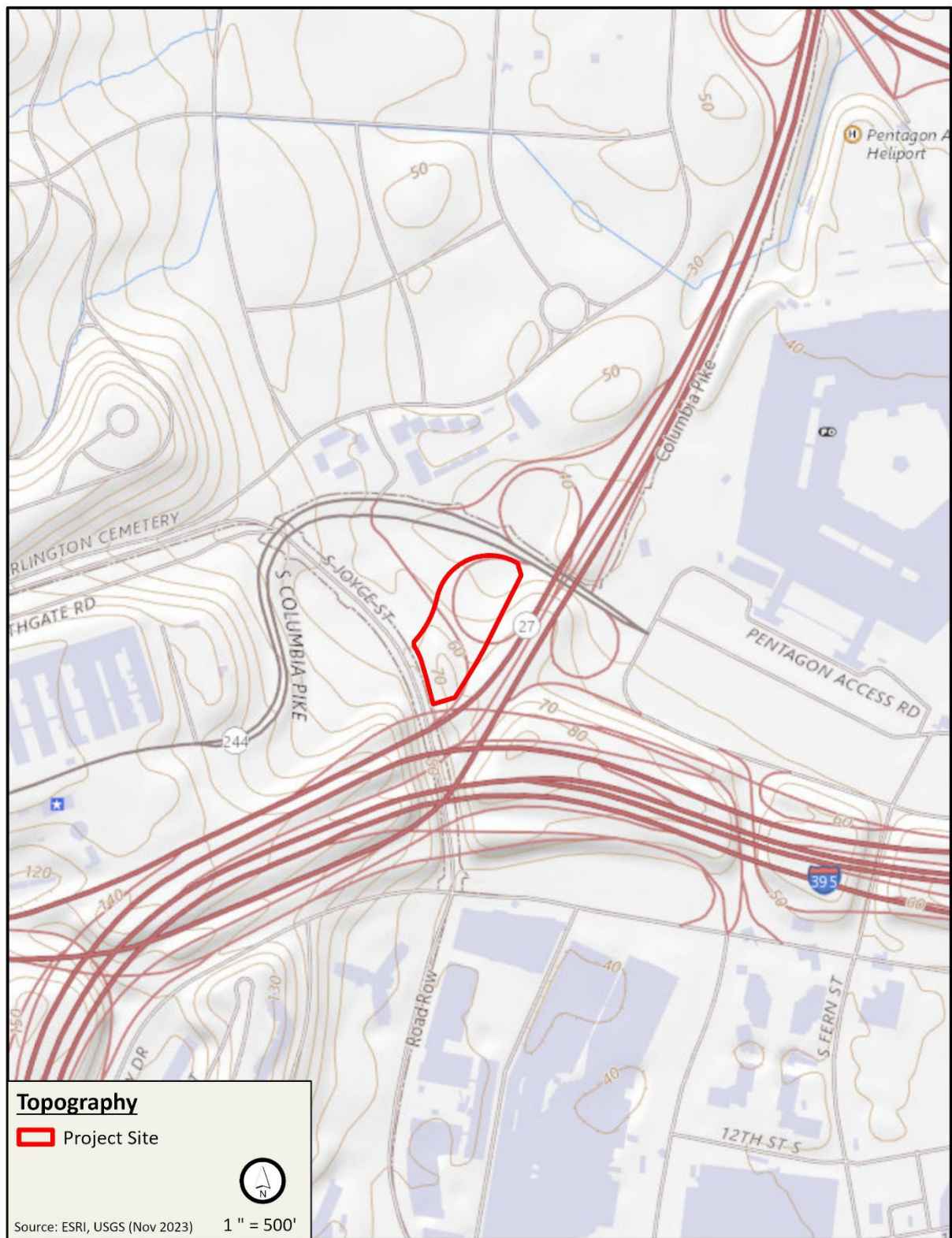


Figure 3-2 - Topography

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As shown in **Figure 3-3, Soils**, the entire project area consists of one soil type, classified as Urban Land – Udorthents complex with 2 to 15% slopes, according to the *Soil Survey of Arlington County, VA* published by the Natural Resources Conservation Service (NRCS). This soil type classification is assigned to areas in which more than 85% of the ground surface is covered by buildings or impervious materials. No sensitive soil types or Prime or Unique Farmland soils occur within the project area.

There are two geological units present within the project area: artificial fill (af) and Sedgefield Member (Qts) (USGS, 2017). Much of the project area is artificial fill - sandy and gravelly materials in areas filled for construction of bridges, dams, and in this particular case, roads/highways. A small portion towards the southwest end of the project area is Sedgefield Member, a geologic formation from the Pleistocene consisting of upward fining sequence of gravelly sand, silt, and clay.

3.4.2 Environmental Consequences

3.4.2.1 Alternatives 1, 2, 3 (Preferred), and 4

Potential impacts to geological or soil resources for each of the build alternatives would be similar and thus are analyzed together in this combined section. For any build alternative, there would be temporary impacts to geologic or soil resources due to construction disturbance; however, because there are no unique geologic features (e.g., caves, cliffs, canyons, etc.) and no sensitive soils present in proposed action areas, these impacts would not negatively alter the geologic characteristics of the areas and thus are not considered significant. The topography of the area will be slightly altered during construction.

3.4.2.2 No Action Alternative

Under the No Action Alternative, there would be no changes to the land selected for the project area, and, therefore, no geological or soil resources would be impacted.

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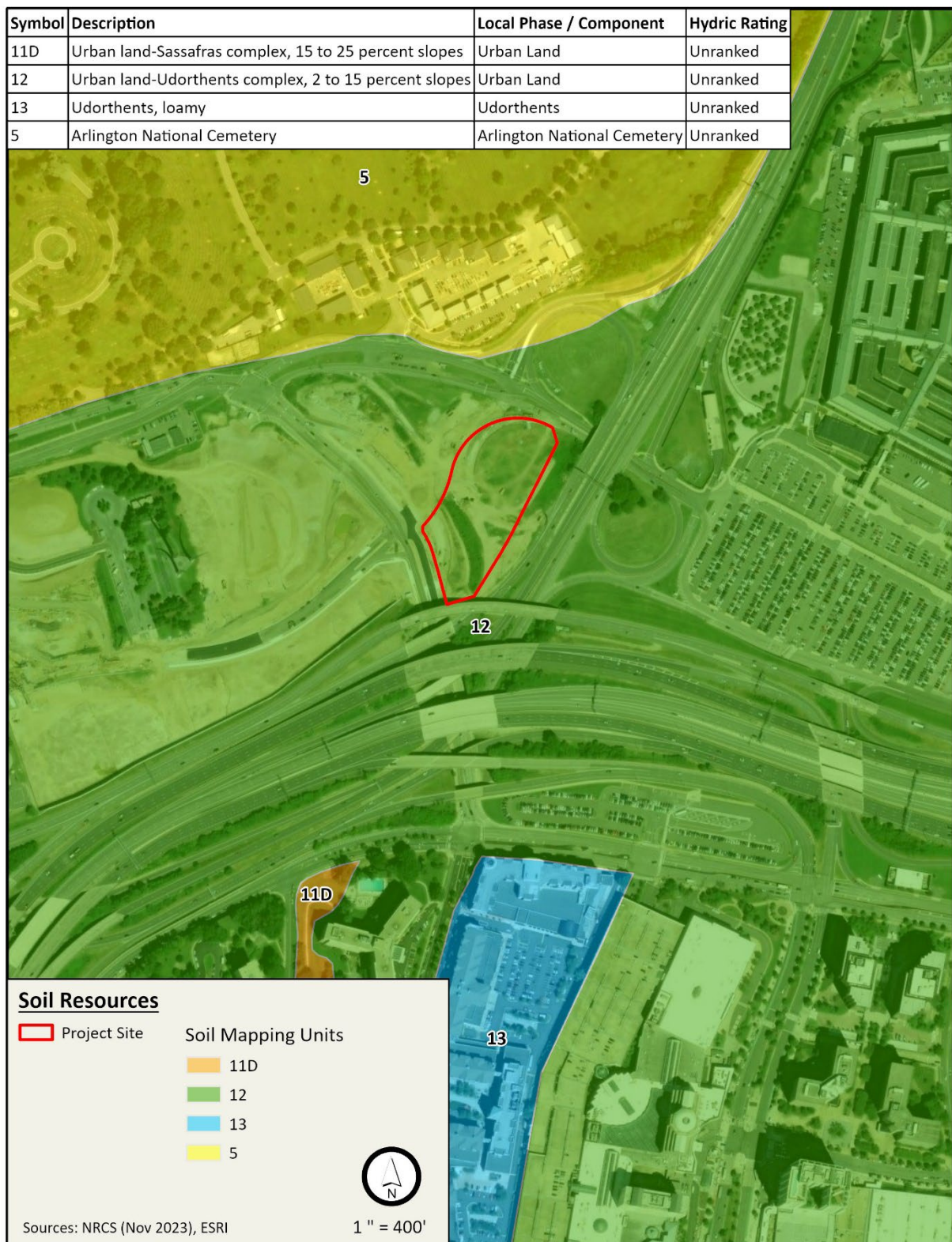


Figure 3-3 – Soils in the vicinity of the Project Site

3.5 Water Resources

3.5.1 Affected Environment

3.5.1.1. Wetlands and Waters of the U.S.

Wetlands and waters of the U.S. are regulated under Sections 401 and 404 of the Clean Water Act (33 U.S.C 1251 *et seq.*). Executive Order 11990, Protection of Wetlands, additionally requires federal agencies to minimize the destruction, loss, or degradation of wetlands that may result from proposed actions. Defined by the Clean Water Act (CWA), wetlands are “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” (40 CFR Part 230).

“Waters of the US” are defined by the U.S. Army Corps of Engineers (USACE) Regulations 33 CFR 328.3 and 40 CFR 120.2, and generally include traditional navigable waters, the territorial seas, and interstate waters and impoundments of those waters, and tributaries to traditional navigable waters, the territorial seas, interstate waters, or impoundments when the tributaries meet either the relatively permanent standard or the significant nexus standard.

The USFWS’s National Wetland Inventory (NWI) mapping showed no presence of wetlands on or near the project area. The absence of jurisdictional wetlands and waters of the U.S. was confirmed during multiple site visits by JMT environmental scientists.

3.5.1.2. Floodplains

Executive Order 11988, Floodplain Management, requires federal agencies to avoid adverse impacts to floodplains, and to minimize the impacts of floods on human safety, health, and welfare.

The project area is located on Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) Panels 51013C0077D and 51013C0081D. The project area is not within any FEMA-designated 100-year or 500-year floodplains. The project area as well as all areas to the east and south including the Pentagon are in zone X, for “Areas determined to be outside the 0.2% annual chance floodplain.” The area to the west and northwest of the project area (including the ANC) is in zone D, for “Areas in which flood hazards are undetermined, but possible.”

3.5.1.3. Stormwater Management and Water Quality

As part of the Clean Water Act’s National Pollutant Discharge Elimination System (NPDES), the DEQ issues permits for all point source discharges to waters of the U.S., dischargers of stormwater from Municipal Separate Storm Sewer Systems (MS4s), and dischargers of stormwater from Industrial Activities. ANC operates a small MS4 under the DEQ’s Virginia Pollutant Discharge Elimination System (VPDES) Permit Number VAR40139, effective November 1, 2018, renewed November 8, 2023, and good for five years (expires in 2028). Pollutants are prevented from discharging into ANC’s MS4 through the use of good housekeeping practices throughout its facilities.

Written procedures, a Stormwater Pollution Prevention Plan, a Nutrient Management Plan, and training are key parts of ANC’s pollution prevention and good housekeeping program. In addition to best management practices (BMPs), these documents are made available to construction contractors.

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3.5.1.4. Coastal Resources

Arlington County is located within Virginia's Coastal Zone, as defined by the Virginia Coastal Zone Management Plan (CZMP), which implements the requirements of the Federal Coastal Zone Management Act (CZMA). All federal actions located within Virginia's Coastal Zone must be consistent with the CZMP to the maximum extent practicable.

In compliance with the CZMP, a Coastal Zone Consistency Determination is being sought from the Virginia Department of Environmental Quality (VDEQ) and is included as **Appendix C**.

The Chesapeake Bay Preservation Act (CBPA) is an enforceable policy of the Virginia CZMP. Two types of resource areas found within the Chesapeake Bay watershed are regulated by the CBPA: Resource Management Areas (RMA) and Resource Protection Areas (RPA). There are no designated RPAs, RMAs, or buffers located within the project area. During the scoping process and in coordination with VDEQ, however, it was determined that the project must adhere to all requirements related to land development on RMA lands.

3.5.2 Environmental Consequences

3.5.2.1 Alternatives 1, 2, 3 (Preferred), and 4

Potential impacts to water resources for each of the build alternatives would be similar and thus are analyzed together in this combined section. For any build alternative, there would be no direct or indirect impacts to wetlands, waters of the U.S., or floodplains, as these resources are not present on-site. Therefore, no significant impacts to wetlands, waters of the U.S., or floodplains is anticipated.

The proposed action will create new point and non-point sources of water pollution. Clean Water Act permits would be required for construction (e.g., VPDES permit for Stormwater Discharges from Construction Activities), and design of the VEC must meet both the Virginia Stormwater Management Program (VSMP) Regulation (9 VAC 25-870) and VA Erosion and Sediment Control (ESC) Regulations. Water quality and quantity treatment requirements would be met on site prior to discharge to existing conveyances. Each build alternative is anticipated to be fully consistent with the coastal lands management policy of the Virginia CZM Program; this will be determined by the disposition of the Coastal Zone Consistency Determination and, therefore, no significant impacts to coastal resources is anticipated.

The ANC Southern Expansion project site limit included the VEC site, and ANC assumed that their pre-development condition for stormwater regulatory compliance was the land cover condition that existed in 2006 (Southern Expansion EA, 2019). The Southern Expansion project post-development condition for the VEC site reflected the removal of all impervious surfaces. Therefore, the pre-development condition for the VEC project is based on a 100% turf condition. Any development of the VEC site would include the construction of impervious surfaces. The resulting increase in stormwater runoff quantity and pollutant load would necessitate the incorporation of stormwater management facilities for the project to mitigate these detrimental impacts to stormwater runoff leaving the site. The site will incorporate underground detention and bioswales in combination, but their exact locations will be determined as the design of the VEC progresses.

In both the existing and proposed condition, most site stormwater runoff drains to drainage inlets that are, or will be, served by the existing storm sewer that flows east under Columbia Pike. The balance of

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site runoff will continue to flow overland (aka “sheet flow”) into S. Joyce Street as it does today. The existing site does not contain impervious surfaces, unlike the proposed action. The increase in stormwater runoff associated with the proposed construction of impervious surfaces will be evaluated to avoid an increase in runoff to S. Joyce Street that could result in drainage problems. Preventing the unacceptable increase in runoff to S. Joyce Street will be accomplished by designing the site grading to reduce the size of the area draining to S. Joyce Street; therefore, the size of the site area draining to S. Joyce Street will be reduced as required to satisfy S. Joyce Street drainage requirements.

The project will incorporate multiple stormwater systems to mitigate onsite stormwater runoff. These systems will control the amount of stormwater runoff leaving the site and will also improve the quality of the water, specifically removing the pollutant phosphorous from the water runoff. Phosphorous comes from quite a few sources including fertilizers and human and animal waste, and is commonly transported into surface waters via stormwater runoff. For this reason, the Virginia Department of Environmental Quality established regulations requiring the removal of phosphorous from stormwater runoff for lands draining to the Chesapeake Bay, and design of stormwater systems on the site will account for these requirements. Also, Low Impact Development (LID) measures that reduce runoff will be provided to address both quality and quantity. The LID measures proposed include bioretention and a vegetated or “green” roof. These systems remove phosphorus from stormwater runoff and reduce the quantity of runoff that reaches the municipal storm sewer system. These systems are also visually pleasing, as they can include multiple types of vegetation such as grasses, shrubs, trees, and succulents.

In addition to the LID measures, the VEC will also include underground detention structures that store stormwater runoff and release it at a slower rate. This lengthens the time it takes for the stormwater to reach downstream pipes and channels so that existing systems are not overwhelmed. Underground filtering devices that remove pollutants, particularly phosphorous, will also be provided.

The VEC’s stormwater systems will be designed to comply with DEQ’s stormwater management regulations. These regulations require that the site peak runoff rate from a 1-year storm be reduced by applying an energy balance equation if the site stormwater outfall contains a natural stream within the extent of review. The quantity controls will also reduce the peak rates of runoff from the 2- and 10-year storms below the pre-development condition. The stormwater quality regulations require reducing the post-development phosphorous load to 20% below the pre-development level, and this requirement will be met in final design. For the stormwater quantity and quality controls, the pre-development condition will be assumed to be 100% managed turf. The proposed stormwater control systems will work together so the surrounding area and downstream areas will not be adversely impacted by the site redevelopment. Because all stormwater management requirements will be met, no significant impact to water resources is anticipated.

3.5.2.2 No Action Alternative

Under the No Action Alternative, there would be no changes to the land selected for the project area, and therefore no water resources would be impacted.

3.6 Biological Resources

3.6.1 Affected Environment

There are several laws that regulate impacts to biological resources but the most relevant in this context is the Endangered Species Act (ESA) and the Migratory Bird Treaty Act (MTBA). As amended, the ESA provides protection for animals and plants designated as threatened or endangered. A species is threatened if it is likely to become endangered in the foreseeable future throughout all or a significant portion of its range. A species is endangered when in danger of extinction throughout all or a significant portion of its range. “Candidate species” are those which could be considered as threatened or endangered under the ESA due to the amount of information on their biological status and threats. The ESA is overseen by the USFWS and the National Oceanic and Atmospheric Administration. The MBTA prohibits the take (including killing, capturing, selling, trading, and transport) of protected migratory bird species without prior authorization by the USFWS.

3.6.1.1 Wildlife

In terms of habitat diversity and species richness, the project area is considered low quality. It is essentially devoid of trees and other vegetative habitat. Species that may be present within the general area include those that are adapted to urban sites, such as white tail deer (*Odocoileus virginianus*), red fox (*Vulpes vulpes*), Virginia opossum (*Didelphis virginiana virginiana*), raccoon (*Procyon lotor lotor*), Eastern gray squirrel (*Sciurus carolinensis*), Eastern cottontail (*Sylvilagus floridanus*), small rodents, common snakes, and various bird species, such as European starling (*Sturnus vulgaris*), American robin (*Turdus migratorius*), blue jay (*Cyanocitta cristata*), red-winged blackbird (*Agelaius phoeniceus*), eastern bluebird (*Sialia sialis*), house sparrow (*Passer domesticus*), and northern mockingbird (*Mimus polyglottos*). These species most likely utilize the project area as a means of access to the adjoining landscape, which contains more suitable habitat and food sources.

The USFWS Information for Planning and Consultation system (IPaC) was utilized to determine the presence of federally-listed threatened and endangered species within the project area. In a letter dated 9 November 2023, USFWS indicated that the Monarch butterfly (*Danaus plexippus*), a candidate species, may be present in the area. Field visits to the project area did not reveal populations or specimens of milkweed plants that this species uses as host plants for reproduction. In a letter dated 4 January 2023, the USFWS also certified that, “except for occasional transient individuals, no federally listed endangered or threatened species are known to exist within the project area. Therefore, no Biological Assessment or further section 7 consultation with the U.S. Fish and Wildlife Service is required.” According to the IPaC database, no critical habitat exists at the project area for any federally-listed threatened or endangered species.

USFWS IPaC also identified several migratory birds of conservation concern (BCC), as well as bald eagles (*Haliaeetus leucocephalus*) and/or golden eagles (*Aquila chrysaetos*) as potentially present within the general project area. Bald eagles are regularly observed throughout the east and would be expected to be observed and possibly nest in proximity to the Potomac River (see VaFWIS report, below), as it offers a stable foraging location for fish, the eagle’s preferred food source. Golden eagles are strictly a migratory species in the mid-Atlantic region and pass through the area in very few numbers during spring and fall migration. There are no large trees in the project area that would be attractive to either species for roosting, hunting, or resting purposes.

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Additional resources consulted included the Virginia Fish and Wildlife Information Service (VaFWIS) database and the scoping response letter from the Virginia Department of Conservation and Recreation, National Heritage Division (VDCR).

The VaFWIS report dated November 9, 2023, listed 15 rare, threatened, or endangered species as either known or likely within a 5-mile radius of the project area, as listed below.

- Two “collection concern” species - spotted turtle (*Clemmys guttata*) and timber rattlesnake (*Crotalus horridus*);
- One “candidate” species, the Monarch butterfly;
- Eight “state-threatened” species - northern long-eared bat (*Myotis septentrionalis*), yellow lance (*Elliptio lanceolata*), wood turtle (*Glyptemus insculpta*), peregrine falcon (*Falco peregrinus*), loggerhead shrike (*Lanius ludovicianus*), Henslow’s sparrow (*Centronyx henslowii*), Appalachian grizzled skipper (*Pyrgus wyandot*), and migrant loggerhead shrike (*Lanius ludovicianus migrans*), and;
- Three “state-endangered” species - Atlantic sturgeon (*Acipenser oxyrinchus*), brook floater (*Alasmidonta varicosa*), little brown bat (*Myotis lucifugus*), and tri-colored bat (*Perimyotis subflavus*).

According to the VaFWIS, there is also a recorded bald eagle nest (AR0801) within five miles of the project area.

Given the negligible habitat value of the mowed turf that covers the project area, none of the species listed above would be expected to make use of the site beyond an ephemeral visit.

VDCR utilizes its Biotics Data System to determine the presence of natural heritage resources, which are defined as the habitat of rare, threatened, or endangered species, unique or exemplary natural communities, and significant geologic formations. The scoping response letter dated January 10, 2023, states that according to the Biotics Data System, there are no occurrences of natural heritage resources documented within the project area.

A copy of the official USFWS species list, results from the VaFWIS database, and the scoping response letter from VDCR may be found in **Appendix D**.

3.6.1.2 Vegetation

The project area is currently a mowed area inside the southwest cloverleaf of the Washington Boulevard (Route 27)/Columbia Pike interchange. This cloverleaf serves as the southbound off-ramp from Washington Boulevard to eastbound Columbia Pike, leading to the entrance to the Pentagon just to the east. The area appears to be regularly rough mowed to keep vegetation at bay. There are a few small trees and shrubs in the cloverleaf’s northeast corner adjacent to the Washington Boulevard overpass of Columbia Pike. Following the completion of the Southern Expansion project and the planned roadway realignment, the project area is expected to remain in a similar condition as it currently is. The habitat value of the site is thus negligible.

3.6.2 Environmental Consequences

3.6.2.1 Alternatives 1, 2, 3 (Preferred), and 4

Potential impacts to biological resources for each of the build alternatives would be similar and thus are analyzed together in this combined section. For any build alternative, it is not anticipated that there would be any direct or indirect impact to wildlife, as there is no critical habitat nor habitat of any real value identified or existing on-site. Should any transient wildlife species or migratory birds exist in the immediate project area at the time of the proposed action, the occurrence would be expected to be highly ephemeral and brief, and any such species would move to adjacent areas at the start of construction.

Impacts to the limited vegetation on site would be anticipated during construction. This impact would be offset at project completion by proposed permanent landscaping, to include region-appropriate turf, shrubs, and other plant material in planting beds. Landscaping would be designed to support the purpose and need of the project as well as be consistent with the overall context, function, and use of the visitor center and the context of the surrounding area.

Based on this information and the guidance from USFWS and VaFWIS, no significant impacts to biological resources are anticipated from the proposed action.

3.6.2.2 No Action Alternative

Under the No Action Alternative, there would be no changes to the land selected for the project area, and, therefore, no impacts to existing wildlife habitat or vegetation would be anticipated.

3.7 Cultural Resources

3.7.1 Affected Environment

Cultural resources include both the natural and built environment, encompassing the relationship between people and said environment. Generally, cultural resources include historic properties, use of the biophysical environment, and environmental attributes such as religious practices and social cohesion. In order to protect these resources, specific laws and regulations have been established.

The Section 106 process is a part of the NHPA that requires Federal agencies to consider the effects of their actions on these properties, following regulations issued by the Advisory Council on Historic Preservation (36 CFR Part 800), within the project's APE. The APE for the proposed action is illustrated in **Figure 3-4**. These considerations include working with other entities like the State Historic Preservation Officer (SHPO) and the public to identify potential resources and effects. If adverse effects on historic properties are identified, agencies must attempt to avoid, minimize, or mitigate these impacts.

On May 25, 2023, ANMC initiated the consultation process with the VDHR in accordance with Section 106 of the NHPA. Additionally, 40 consulting parties were invited to participate in the Section 106 process (see **Appendix F**). A consulting party meeting was held on September 6, 2023, to discuss the proposed action, the VIA, and determined APE. After this meeting and the initial 30-day comment period, ANMC revised and updated the prior Section 106 submission in response to feedback received from consulting parties and the public. ANMC then notified the VDHR, consulting parties, and the public of the availability of the documents.

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ANMC decided to provide the parties with a secondary comment period from November 29-December 15, 2023. Notifications were emailed to consulting parties and placed on ANMC and PMF "Public Notices" pages. ANMC reviewed received comments and at the closure of the second comment period developed a determination of effects for the projects. On April 2, 2024, consulting parties and the Virginia Department of Historic Resources were notified of a finding of No Adverse Effect for the project. This information was additionally placed on the ANMC and PMF "Public Notices" pages. After a 30-day comment period, and no dissenting comments, the project was determined to have a final finding of No Adverse Effect on May 2, 2024.

3.7.1.1 Historic Context

The land that is now occupied by the Arlington National Cemetery was once inhabited by Native Americans. Historically, the Chesapeake Bay coastal area maintained a Native American population throughout Virginia as a result of the rich agriculture and marine life. English settlers did not arrive to the area until the 17th century. By the 18th century, the land today known as the Arlington National Cemetery constituted the estate of the Custis family, one of the wealthiest in Virginia at the time (Southern Expansion EA, 2019).

George Washington Parke Custis, stepson of George Washington and grandson of Martha Custis Washington, began work on Arlington House in 1801. The name Arlington came from the historic Custis Plantation on the Eastern Shore (Southern Expansion EA, 2019). The new estate comprised 1,100 acres, overlooking the Potomac River towards Washington, D.C. The Arlington House was designed by architect George Hadfield, and is considered the earliest, most prominent example of Greek Revival architecture in the country. Beyond the building, the landscaping of the surrounding area was designed in a curvilinear pattern, meant to imitate European garden (Army Corps of Engineers- ERDC, Arlington National Cemetery Historic District National Register Nomination, 2014). Custis's daughter, Mary Randolph Custis, was his sole surviving heir. Mary Randolph Custis married Robert E. Lee, who would serve in the Confederate Army during the Civil War. At the passing of her father in 1857, Mary Lee inherited the entire Arlington estate. At the onset of the Civil War, however, Lee and her family abandoned the property, and it was acquired by the U.S Government in 1863 for a sum of \$26,000 (Army Corps of Engineers - ERDC, Arlington National Cemetery Historic District National Register Nomination, 2014).

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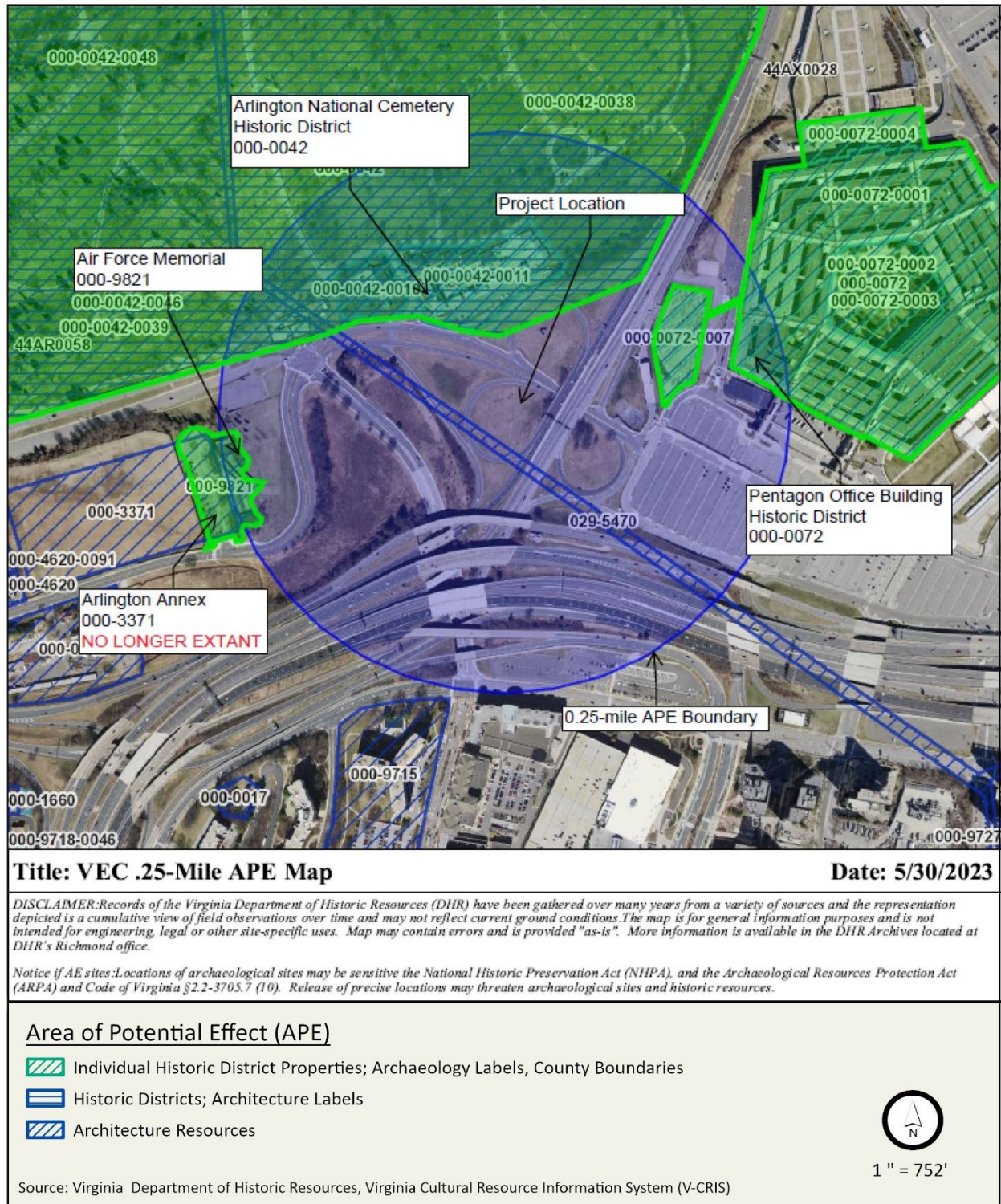


Figure 3-4 – Area of Potential Effect

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Legislation passed by Congress on April 16, 1862, freed all enslaved people in Washington, D.C. While a monumental step, the effects of over-crowdedness and lack of resources spurred the need for the federal government to set up camps that would provide shelter. Arlington was chosen as a site for one of the settlements, and as a result, the Freedman's Village was first established in 1863 and was meant to be a model community that would provide opportunities to teach vocations to the freed and enable them to eventually leave the village and integrate into society. The plan of Freedman's Village is depicted in an 1865 model of the community (see **Figure 3-5**). The Freedman's Village in Arlington eventually transformed into a semi-permanent community with thousands of residents (National Park Service, "Freedman's Village," 2021). Freedman's Village on Arlington property is unique in that it continued to develop a thriving community with schools, hospitals, and churches that remained on the property until 1900 (Arlington National Cemetery, "Freedman's Village").

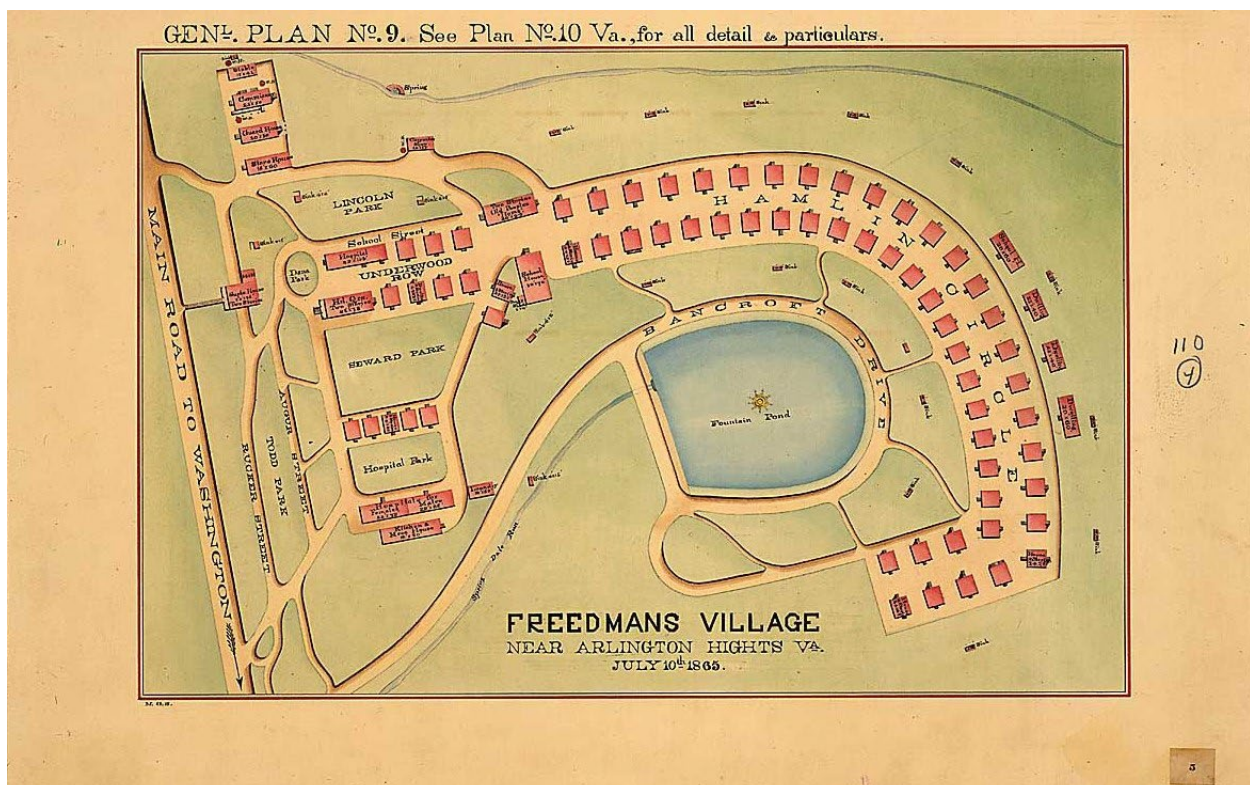


Figure 3-5 – 1865 Model of Freedman's Village (Map courtesy of Arlington Public Library post, "From Freedman's Village to Queen City", 2018)

Initially, the Arlington National Cemetery was comprised of 200 acres of land that had been designated for burial purposes in 1864. At that time, a large battle known as the "Wilderness Campaign" that caused tens of thousands of casualties created a major need for burial space and so the cemetery was designated by the War Department. By 1888, however, the need for more burial space spurred the Army to expand further south. While this expansion did not eliminate the Freedman's Village, it did use land that was farmed by its residents. Additionally, the land that Freedman's Village occupied had been designated by the Army for future use. The cemetery was expanded in 1897 to its current southern boundary which resulted in the elimination of the Freedman's Village (Southern Expansion EA, 2019).

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Queen City was a neighborhood whose original residents were descended from residents that lived in the Freedman's Village. While Freedman's Village was closing, and after its closure, many residents moved to the nearby community of East Arlington. The Mount Olive Baptist Church purchased two acres of the East Arlington community, and these two acres became known as Queen City (Arlington Public Library, "From Freedman's Village to Queen City," 2018). Queen City is described as having been a close-knit community with a focus on education (The Black Heritage Museum of Arlington, "Queen City," 2023). At the onset of World War II, however, it was determined that the War Department needed to expand, and it utilized eminent domain to take over the land of Queen City and East Arlington to build the Pentagon (Arlington Public Library, "From Freedman's Village to Queen City," 2018). The cloverleaf highway structure highlighted in the figure below was built on the historic Queen City community (see **Figure 3-6**). At the time of its closure, Queen City was occupied by over 900 residents.

Queen City Location

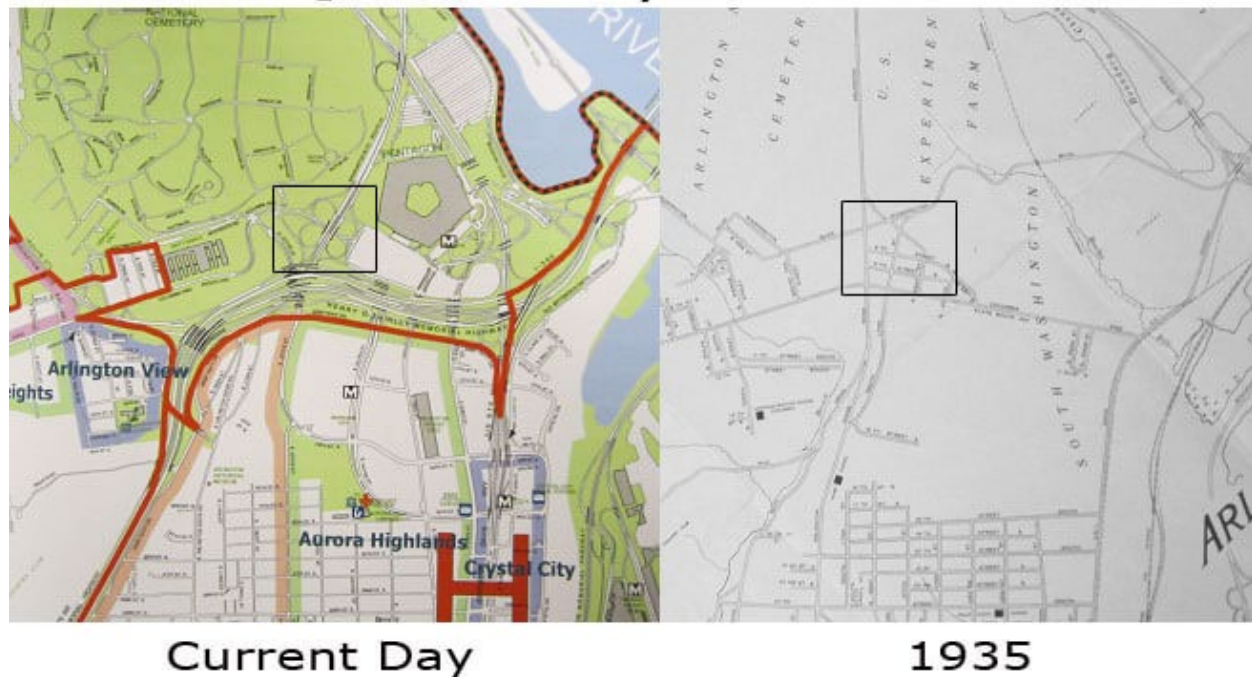


Figure 3-6 – Queen City, 1935 vs. Current Day (Image taken from The Black Heritage Museum of Arlington article, "Queen City: Arlington's Lost Neighborhood").

The most recent expansion of ANC is the Southern Expansion project, which is the first expansion of Arlington National Cemetery outside of the historic Arlington Estate. This project was first initiated in 2016 and continues today. The project area for the proposed VEC is located entirely within the land designated for the Southern Expansion (Southern Expansion EA, 2019).

The project location is on the site where Queen City was once located. The area has been heavily disturbed by the construction of the Pentagon in the mid-20th century, as well as the extensive development of infrastructure. The proposed VEC will include interpretation that reflects the importance of the history of Queen City and the communities that historically resided in the project area.

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3.7.1.2 Archaeological Resources

Identification efforts were undertaken to determine the presence of archaeological resources within the project area. The site of the proposed action has been extensively disturbed as a result of construction and demolition of buildings and infrastructure. An archaeological evaluation was completed in 2016 as part of the ANC Southern Expansion undertaking. The findings of the report determined it unlikely that there would be intact archaeological deposits within the project area (Southern Expansion EA, 2019). VDHR concurred with the findings of this evaluation. Therefore, the likelihood of finding or identifying any new archaeological resources is low. (Southern Expansion EA, 2019). If construction activities cause unanticipated findings or cultural artifacts, however, the appropriate agencies (VDHR) will be notified. All required procedures will be followed to determine the significance of the unanticipated findings. ANMC will comply with the guidelines in the ANC PA and Southern Expansion MOA. ANMC shall have PMF include the language regarding "Post Review Discoveries" and "Unidentified Human Remains" in all contracts involving ground disturbance.

3.7.1.3 Building, Structures, and Landscapes

The proposed action would have visual effects on the ANC Historic District, the Pentagon Office Building Complex Historic District, and the Air Force Memorial. These resources have been determined as eligible for listing or are NRHP-listed properties. Based on projections, the proposed action viewshed impacts also have the potential to affect resources further from the project area like the National Mall or the Lyndon B. Johnson Memorial Park.

A visual APE for the project was established through the Visual Impact Assessment (VIA, included as **Appendix F**) developed for the project. Using LiDAR data, a digital elevation model (DEM) was developed which projected what areas would have potential visibility of the proposed action. Historic properties within the established APE and the projected APE from the DEM were selected as vantage points to evaluate potential visual effects. This analysis was completed after the preferred alternative, Alternative 3, was selected. The other alternatives were rendered to illustrate the potential impacts to the landscape, but further analysis of potential impacts to historic resources was not completed.

While it is not a listed or eligible resource, the proposed site is the location of the historic Queen City and the proposed VEC could impact the community's association to the surrounding area. Among the comments received for the proposed project, the National Park Service identified the opportunity for interpretation of Queen City at the site. Consideration of this site and its associated communities will be taken into account as the project progresses.

3.7.2 Environmental Consequences

3.7.2.1 Alternative 1

The potential impacts to historic resources within the APE under this alternative would be greater than the Preferred Alternative. Alternative 1 locates the proposed VEC at the south end of the project area, which is a higher grade than the northern side. The proposed building would have an overall height of approximately 105'-00," which is higher than the Preferred Alternative and therefore more likely to have visual effects on nearby historic resources due to being more visible from those locations. The visual effects have the potential to adversely affect the viewsheds of the historic resources by impacting the lines of sight, which are character-defining elements of the resources. The adverse effects to character

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defining elements of the historic resources in the project area would constitute significant impacts as a result of the alternative.

3.7.2.2 Alternative 2

The potential impacts to historic resources within the APE under this alternative would be greater than the Preferred Alternative. Alternative 2 sites the proposed VEC at the south end of the project area, which is a higher grade than the northern side. The proposed building would have an overall height of approximately 126'-00," which is higher than the Preferred Alternative and, therefore, more likely to have visual effects on nearby historic resources due to being more visible from those locations. The visual effects have the potential to adversely affect the viewsheds of the historic resources by impacting the lines of sight, which are character-defining elements of the resources. Therefore, this alternative would result in significant impacts to the historic resources within the project area.

3.7.2.3 Alternative 3 (Preferred Alternative)

The Preferred Alternative proposes to construct the VEC at the north end of the project area, which has a lower elevation than the remainder of the site. The proposed building will have an overall height of 36.0 feet with a maximum elevation of 91.0 feet. This alternative, set lower than the other alternatives, was selected partly to minimize potential visual impact on the surrounding historic resources.

This alternative considered comments made by both CFA and NCPC during their respective hearings for the initial conceptual design. For example, Alternative 3 addresses comments made by CFA (meeting on 28 September 2022) regarding the originally proposed design's potential intrusion to the Flight 77 linear path and concerns regarding parking. These comments were addressed by locating the building in the lowest elevation of the project site and rearranging the overall site plan. Comments received from other parties, like the Air Force District Washington, identified possible impacts from noise, light, and smell. This preferred alternative takes these indirect effects into account by arranging the building's exterior and interior circulation plans accordingly. For a full list of comments received from consulting parties regarding potential effects, please refer to **Appendix F**.

Field investigations were undertaken to determine any potential effects of the Preferred Alternative on previously identified vantage points. The vantage points were identified using the Arlington National Cemetery ICRMP, the Southern Expansion Visual Impact Assessment, and ArcGIS DEM projections. The DEM projects create a map to show potential visibility of the site based on the grade of the site and height of the proposed building. Eleven vantage points were used in the completion of the Visual Impact Assessment. Six of these vantage points were within the boundaries of the Arlington National Cemetery Historic District, and the remaining five points were taken from eligible and NRHP-listed resources outside the district. The documentation was completed in February of 2023, when the character defining vegetation of the area was at its thinnest. The VIA concluded that while the proposed building would be visible from some vantage points, the visibility does not constitute an adverse effect on any NRHP-listed or eligible resources (see **Appendix F**). Therefore, this alternative would yield no significant impact on the historic resources in the project area. This finding was not contested by the Virginia Department of Historic Resources or any consulting parties.

3.7.2.4 Alternative 4

The potential impacts to historic resources within the APE under this alternative would be greater than the Preferred Alternative. Alternative 4 sites the proposed VEC at the south end of the project area,

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which is a higher grade than the northern side. The proposed building would have an overall height of approximately 105'-00," which is higher than the Preferred Alternative and, therefore, more likely to have visual effects on nearby historic resources due to being more visible from those locations. The visual effects have the potential to adversely affect the viewsheds of the historic resources by impacting the lines of sight, which are character-defining elements of the resources. This alternative would have significant impact on viewshed of the historic resources within the project area.

3.7.2.5 No Action Alternative

The No Action Alternative would have no effects on Cultural Resources. There would be no changes to the existing site, nor visual effects on any surrounding historic resources. Given the lack of change, this alternative would result in no significant impact to historic resources in the project area.

3.8 Socioeconomics

3.8.1 Affected Environment

Environmental Justice (EJ) is defined as the just treatment and meaningful involvement of all people, regardless of income, race, color, national origin, Tribal affiliation, or disability, in decision-making and other Federal activities that affect human health and the environment. Economic and social elements such as demographic information and applicable Executive Orders protecting various population groups are required for the NEPA analysis. EO 12898 – *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, and EO 13045 – *Protection of Children from Environmental Health Risks and Safety Risks* direct federal agencies to identify and evaluate potential impacts and avoid or minimize to the greatest extent practicable and permitted by law. The environmental health risks and safety risks outlined in EO 13045 are risks attributable to products or substances, including air, water, and soil, that a child may encounter or ingest. EO 14096 - *Revitalizing Our Nation's Commitment to Environmental Justice for All*, expands upon EO 12898 to include consideration of federal actions with respect to human health and the environment so that people:

- are fully protected from disproportionate and adverse human and environmental effects (including risks) and hazards, including those related to climate change, the cumulative impacts of environmental and other burdens, and the legacy of racism and other structural or systematic barriers; and
- have equitable access to a healthy, sustainable, and resilient environment in which to live, play, work, learn, grow, worship, and engage in cultural and subsistence practices.

Figure 3-7 shows the Census Tracts containing and surrounding the VEC site. Poverty level is based on the U.S. Department of Health and Human Services Guidelines for a household of four (\$26,500). The demographic data presented by the U.S. Census Bureau for Census Tract 1025 (which includes Foxcroft Heights) indicated a non-white population of 52.5%; 3.5% of families and 5.0% of individuals below the poverty level; and a median household income of \$109,026. The demographic data presented by the U.S. Census Bureau for Census Tract 1035.01 (includes residential portion of Pentagon City) indicated a non-white population of 47.8%; 2.9% of families and 9.2% of individuals below the poverty level; and a median household income of \$107,847. The demographic data presented by the U.S. Census Bureau for Census Tract 1035.05 (includes commercial portion of Pentagon City) indicated a non-white population of 49.9%; 24.8% of families and 23.2% of individuals below the poverty level; and a median household income of \$94,917.

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The demographic data presented by the U.S. Census Bureau for Census Tract 9801 (encompasses the project area), a sparsely populated public area, and Arlington County (for comparison) indicated:

- The minority (non-white) population is approximately 75%; Arlington County, 41.5%
- The percent of families below the poverty level is 0%; Arlington County, 4.2%
- The percent of individuals below the poverty level is 0%; Arlington County, 6.5%

The median household income is not available for Census Tract 9801 though in Arlington County, the median household income is estimated at \$128,145.

The cultural resources analysis and consultations through the NHPA Section 106 process identified interest within the Arlington community in previous impacts to the low-income, minority community in Queen City, which was displaced when the current highway system and cloverleaf were constructed adjacent to the Pentagon complex. These effects were incorporated in the Section 106 consultations (see Section 3.7 and Appendix F). Such impacts were created by projects that predate the VEC, thus a full analysis of those impacts are outside the scope of this project and its purpose/need; however, we acknowledge that the community has an interest in how this land is used. The Army's utilization of the land and the proposed action impacts alternate uses, such as the extent of commemoration & interpretation; however, there are no direct adverse effects to National Register or National Register-eligible historic properties, because the area is highly disturbed.

A more detailed overview of the area's history and prior comments are presented in the Southern Expansion EA, Appendix A, and Appendix G. The Southern Expansion EA can be viewed at the following link:

[Final Environmental Assessment for the Arlington National Cemetery Southern Expansion and Associated Roadway Realignment \(arlingtoncemetery.mil\)](https://www.arlingtoncemetery.mil/About-Arlington-National-Cemetery/Environmental-Assessment/Pentagon-Memorial-Visitor-Education-Center/Southern-Expansion-and-Associated-Roadway-Realignment)

3.8.2 Environmental Consequences

3.8.2.1 Alternatives 1, 2, 3 (Preferred), and 4

Potential impacts to socioeconomics for each of the build alternatives would be similar and thus are analyzed together in this combined section. For any build alternative, it is not anticipated that there would be any direct or indirect impact to socioeconomic resources, as it would not destroy aesthetic values; disrupt community cohesion or a community's economic vitality; produce adverse employment effects; displace persons or businesses; affect local land use; add to or generate new hazardous materials or waste; affect water quality or other natural resources; or reduce the level of service on realigned roadways (see **Section 3.9 Transportation and Traffic**). Temporary impacts during construction may include noise and fugitive dust. Unless alternative hours are required to maintain a functional roadway, the construction would adhere to a typical workday, during daylight hours only, to avoid or minimize noise intrusion on nearby residents or burial services. BMPs would be utilized to avoid or minimize impacts caused by fugitive dust, including perimeter fencing/barriers, applying water to disturbed soils or high traveled areas, and reseeding/revegetating disturbed areas. Therefore, no significant socioeconomic impacts are expected from the proposed action.

The potential for health risks from ACM-contaminated soil and release is discussed in **Section 3.12, Hazardous Materials and Waste**.

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3.8.2.2 No Action Alternative

Under the No Action Alternative, there would be no changes to the land selected for the project area, and therefore no impacts to existing socioeconomic resources would be anticipated.

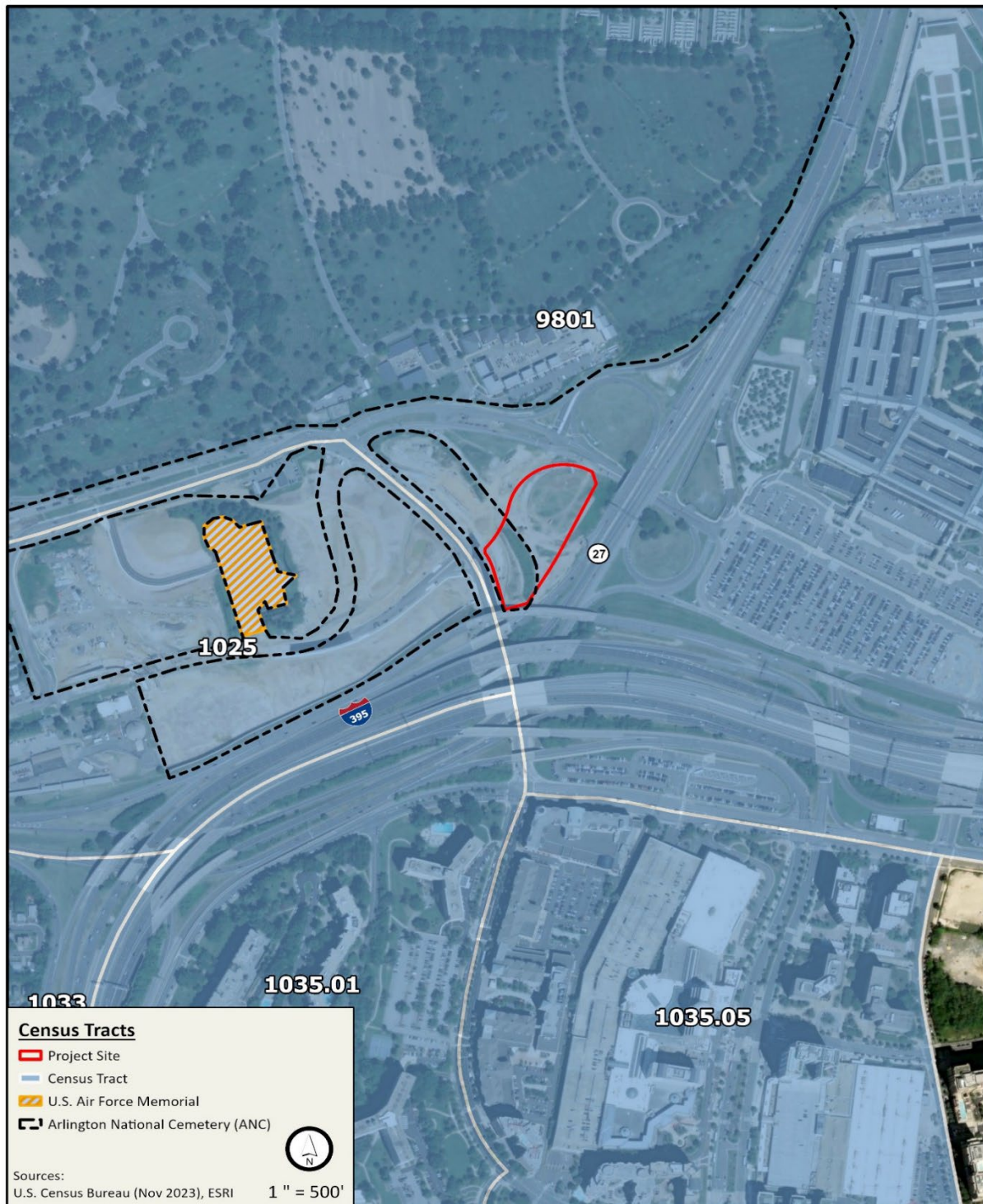


Figure 3-7 – Census Tracts including and surrounding the Project Site

3.9 Transportation and Traffic

3.9.1 Affected Environment

This section describes existing transportation conditions and summarizes an analysis of project impacts on transportation and traffic. A more detailed study, prepared as a Multimodal Transportation Assessment in accordance with Arlington County guidelines, is provided in **Appendix G**.

3.9.1.1 Transportation Network

The transportation network within and adjacent to the Pentagon Memorial Visitor Education Center site consists of roadways, bus stops, pedestrian walkways, and bikeways.

Columbia Pike (Route 244) is a four-lane urban principal arterial that runs east-west from Washington Boulevard and S. Joyce Street to Route 236 (Little River Turnpike) in Annandale, Virginia. Columbia Pike intersects major routes in northern Virginia such as Lincolnia Road, Route 7, George Mason Drive, and Glebe Road. Columbia Pike is also considered the principal street in South Arlington. The posted speed limit in the vicinity of the VEC site is 25 MPH.

S. Joyce Street is a two-lane minor arterial that runs north-south from Columbia Pike to 15th Street S in Arlington Virginia. The posted speed limit in the vicinity of the VEC site is 25 MPH.

Washington Boulevard (Route 27) is a four-lane urban principal arterial with two lanes in each direction running east-west. It connects major travel routes in northern Virginia, such as the George Washington Memorial Parkway, Route 110, I-395, and US Route 50. The posted speed limit in the vicinity of the VEC site is 45 MPH.

Army Navy Drive is a four-lane major collector with two lanes in each direction running east-west from S Lynn Street to Long Bridge Drive. Army Navy Drive provides connection to I-395.

The Federal Highway Administration (FHWA) is undertaking a Defense Access Roads project (referred to as the “DAR project”) which will realign the eastern end of Columbia Pike in the study area, modify its intersection with S. Joyce Street and its interchange with Washington Boulevard (VA Route 27) near the Pentagon, and replace Southgate Road with a new S. Nash Street alignment. The reconfiguration of these roadways will accommodate the ANC Southern Expansion and will create the site for the VEC. The project area will be bounded by the realigned Columbia Pike to the north, S. Joyce Street to the west, and Washington Boulevard to the east and south. The general extents of the study area are Columbia Pike to the north, Army Navy Drive to the south, S. Hayes Street to the east, and the Washington Boulevard Off Ramp at Columbia Pike and S. Orme Street to the west. **Figure 3-8** shows the major local transportation facilities in the vicinity of the site prior to the DAR project, and **Figure 3-9** shows the site location and the configuration of the immediate vicinity after the completion of the DAR project.

The site has access to the Washington Metrorail (mass rapid transit [MRT] system) Blue and Yellow Lines via the Pentagon and Pentagon City Metro Stations, which provide connections to areas in Virginia, the District, and Maryland. The Blue Line connects Springfield, VA with Largo, MD and the Yellow Line connects Huntington, VA with Greenbelt, MD, with both lines providing access to the District core. Both lines provide connections to the Red Line, which provides a direct connection to Union Station, a hub for commuter rail – such as Amtrak, MARC, and VRE – in addition to all additional Metrorail lines, allowing for access to much of the DC Metropolitan area.

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Several bus systems provide local transit service in the vicinity of the site, including connections to several neighborhoods within Virginia, the District, and additional Metro stations. As shown in **Figure 3-8**, there are multiple bus routes that serve the site. In the vicinity of the site the majority of routes travel along Columbia Pike, S. Joyce Street, and Army Navy Drive.

There are existing bicycle facilities that connect the site to areas within Arlington, Virginia, and the District including the Washington Boulevard Sidepath, an off-street facility that extends along Washington Boulevard. There are bicycle lanes on S. Joyce Street and S. Hayes Street that provide connectivity to more bicycle facilities in Pentagon City and Crystal City.

3.9.1.2 Traffic Conditions

A traffic analysis of the Existing and Background (future no-build) conditions were conducted for the peak AM and PM hours at the study intersections listed below and shown in **Figure 3-10**:

1. Columbia Pike and Washington Boulevard Off Ramp/S Orme Street
2. Columbia Pike and S Nash Street
3. Columbia Pike and Air Force Memorial Drive
4. Columbia Pike and S. Joyce Street
5. Columbia Pike and Site Driveway
6. S. Joyce Street and Washington Boulevard SB Ramps
7. Army Navy Drive and Site Driveway
8. Army Navy Drive and S. Joyce Street
9. Army Navy Drive and S Hayes Street

Intersection capacity analyses were performed for the morning and afternoon peak hours at study area intersections. Synchro version 11 was used to analyze the study intersections based on the *Highway Capacity Manual* (HCM) 2000 methodology.

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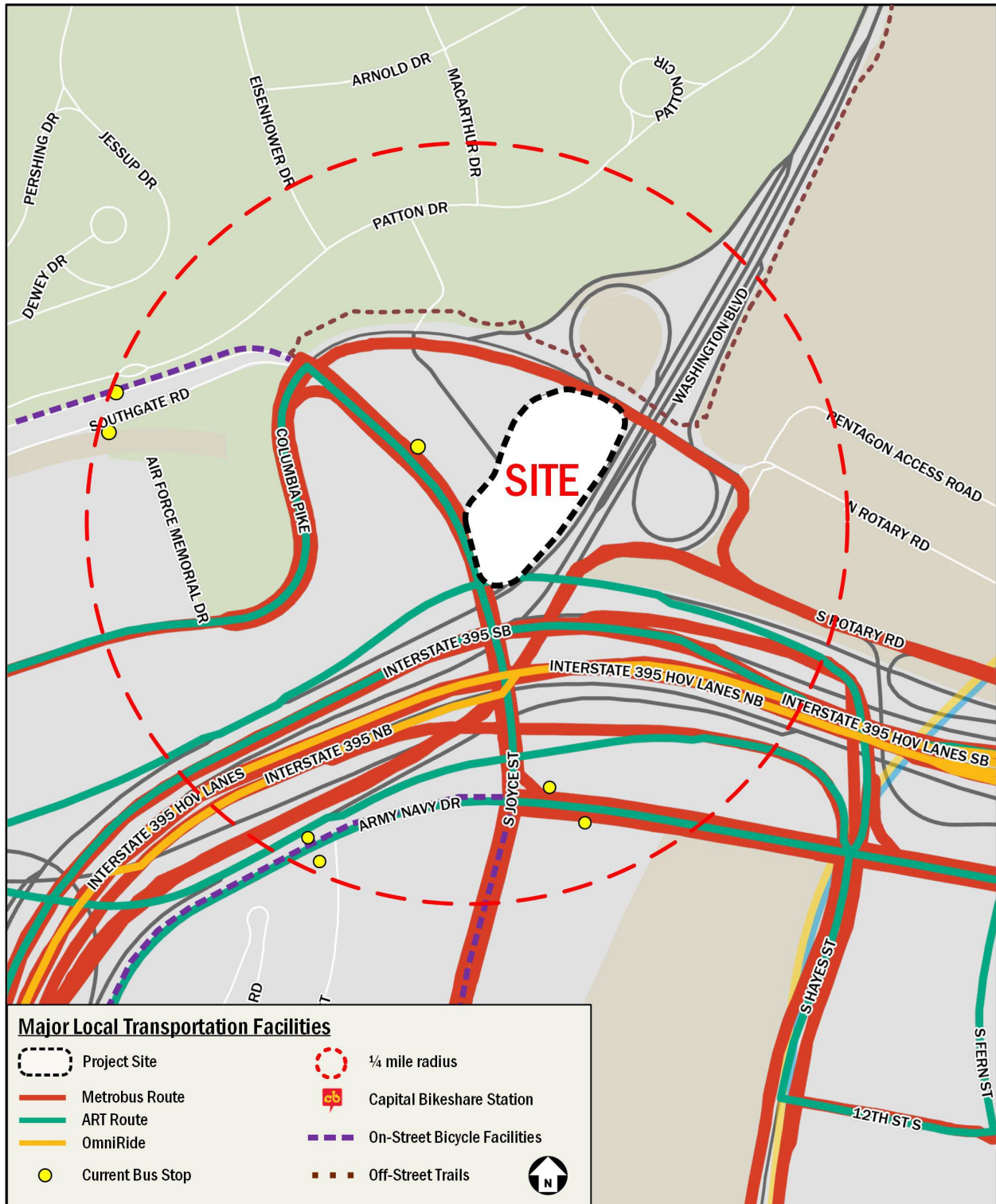


Figure 3-8 - Major Local Transportation Facilities

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Figure 3-9 - Site Configuration of the Immediate Vicinity after DAR Project is Completed

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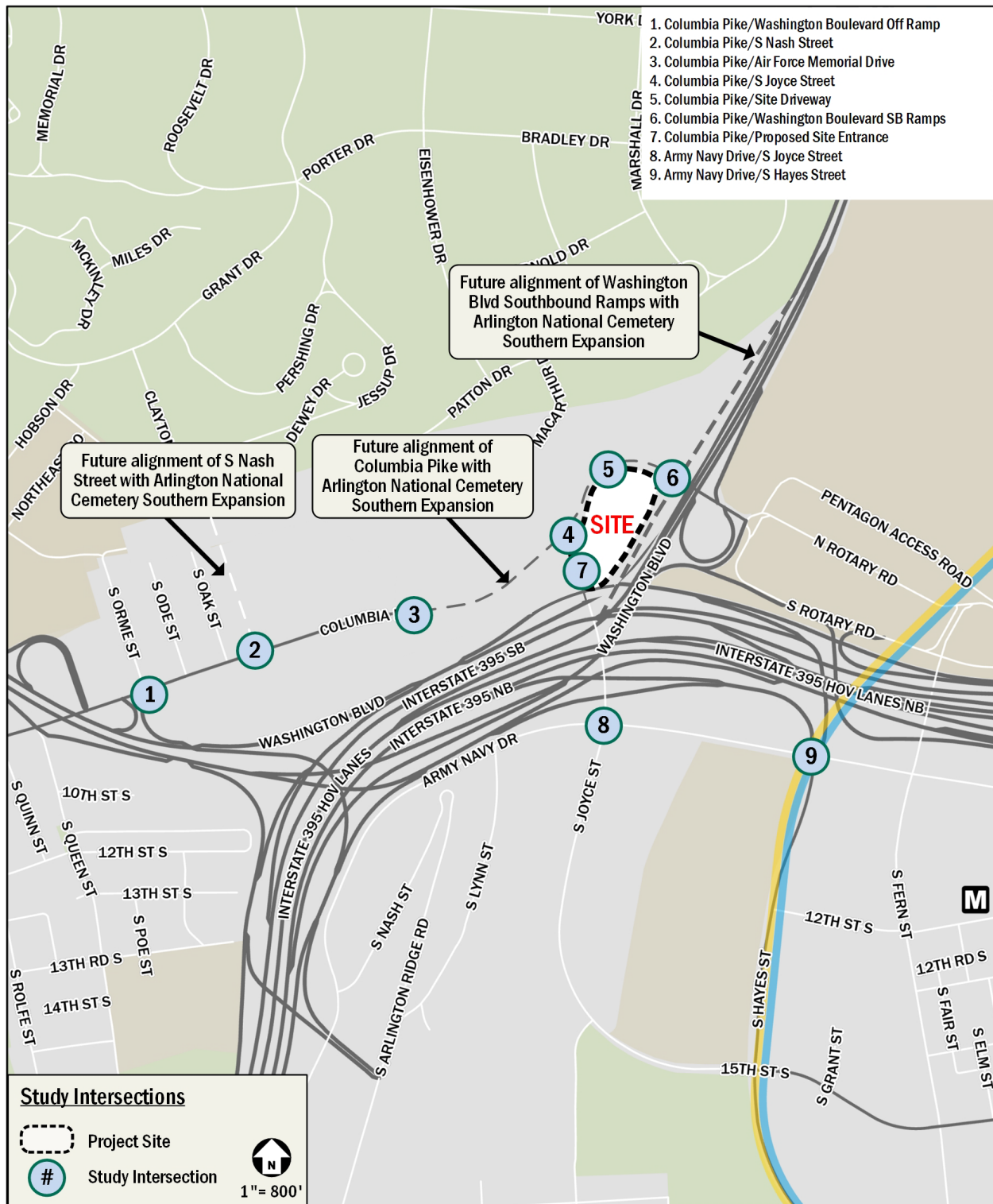


Figure 3-10 - Study Intersections

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3.9.1.2.1 Existing Conditions Analysis Results

The Existing Conditions results of the intersection capacity analyses for the AM and PM peak hours are expressed in level of service (LOS) and delay (seconds per vehicle) per movement. At the time this study was prepared, construction on the DAR project was underway and closed several roads in the study area. As a result, the existing analysis year was set as 2022 to model conditions prior to the commencement of the DAR construction.

Figure 3-11 provides a description of the Level of Service (LOS) criteria.

The capacity analysis results indicate that most intersections operate at acceptable LOS (LOS E or better) under the Existing Conditions; however, two intersections have one or more movements that operate at levels beyond acceptable thresholds (LOS F) in one or more peak hour:

- Columbia Pike & S. Joyce Street
 - Northbound Left (PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Northbound Left (PM Peak Hour)

The Existing Conditions queuing results for the AM and PM peak hours are expressed by movement. Four intersections have at least one movement with 95th percentile queues that exceed the available storage length in the morning and/or afternoon peak hour:

- Columbia Pike & Washington Boulevard Off-Ramp/S Orme Street
 - Southbound Right (AM and PM Peak Hour)
- Columbia Pike & S. Joyce Street
 - Westbound Left (PM Peak Hour)
 - Northbound Left (PM Peak Hour)
- Army Navy Drive & S. Joyce Street
 - Northbound Left (PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Eastbound Left (PM Peak Hour)
 - Northbound Left (PM Peak Hour)
 - Northbound Right (PM Peak Hour)

3.9.1.2.2 Background Analysis Results

The capacity analysis results indicate that most intersections operate at acceptable LOS (LOS E or better) under the Background Conditions; however, two intersections have one or more movements that operate at levels beyond acceptable thresholds in one or more peak hour:

- Army Navy Drive & S. Joyce Street
 - Northbound Left (PM Peak Hour)
 - Southbound Left (PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Overall Intersection (PM Peak Hour)
 - Eastbound Left (PM Peak Hour)
 - Eastbound Right (PM Peak Hour)
 - Westbound Left (AM and PM Peak Hour)
 - Westbound Right (PM Peak Hour)
 - Northbound Left (AM and PM Peak Hour)

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- Southbound Left (AM and PM Peak Hour)

The queuing results for the AM and PM peak hours indicate that four intersections have at least one movement with 95th percentile queues that exceed the available storage length in the morning and/or afternoon peak hour:

- Columbia Pike & Washington Boulevard Off-Ramp/S Orme Street
 - Southbound Right (AM and PM Peak Hour)
- Columbia Pike & S. Joyce Street
 - Westbound Left (PM Peak Hour)
 - Northbound Left (AM and PM Peak Hour)
- Army Navy Drive & S. Joyce Street
 - Northbound Left (PM Peak Hour)
 - Northbound Thru/Right (PM Peak Hour)
 - Southbound Left (AM and PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Eastbound Left (PM Peak Hour)
 - Westbound Left (PM Peak Hour)
 - Westbound Right (PM Peak Hour)
 - Northbound Left (PM Peak Hour)
 - Northbound Right (PM Peak Hour)
 - Southbound Left (AM Peak Hour)

Level of Service (LOS)

Level of service (LOS) is a qualitative measure used to describe how well a transportation facility or service operates from the traveler's perspective. Factors influencing traveler's perceived quality of service include: travel time, speed, delay, convenience, safety, etc. The LOS is measured on a familiar "A" (best) to "F" (worst) scale.

The level-of-service of an intersection is determined by analyzing each approach individually. A computation is made of each approach during both the morning and afternoon peak hours.

Signalized intersection level of service is defined in terms of the average total vehicle delay of all movements through an intersection. Vehicle delay is a method of quantifying several intangible factors, including driver discomfort, frustration, and lost travel time. Specifically, LOS criteria are stated in terms of average delay per vehicle during a specified time period (for example, the PM peak hour). Vehicle delay is a complex measure based on many variables, including signal phasing (i.e. progression of movements through the intersection), signal cycle length, and traffic volumes with respect to intersection capacity. Automobile LOS criteria for signalized intersections are shown in the following table:

LOS	Average Control Delay (seconds/vehicle)	General Description (Signalized Intersections)
A	≤ 10	Free flow
B	>10 - 20	Stable flow (slight delays)
C	>20 - 35	Stable flow (acceptable delays)
D	>35 - 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 - 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Source: Transportation Research Board, *Highway Capacity Manual*, 2010. Washington DC.

Figure 3-11 - Level of Service

3.9.1.2.3 Crash Data Review

A review of VDOT historical crash data from 2018 to 2022 in the project study area was conducted.

Figure 3-12 shows reported crashes within 100 feet of all study intersections and along streets fronting the project area for that time period. The location with the greatest number of reported crashes was the intersection of S Hayes Street and Army Navy Drive, with 91 of the 113 (or 80%) reported crashes occurring at or near this intersection. **Figure 3-13** shows the number of crashes per year in the study area over the last five years. The data obtained from VDOT shows that the number of reported crashes generally varies from year to year.

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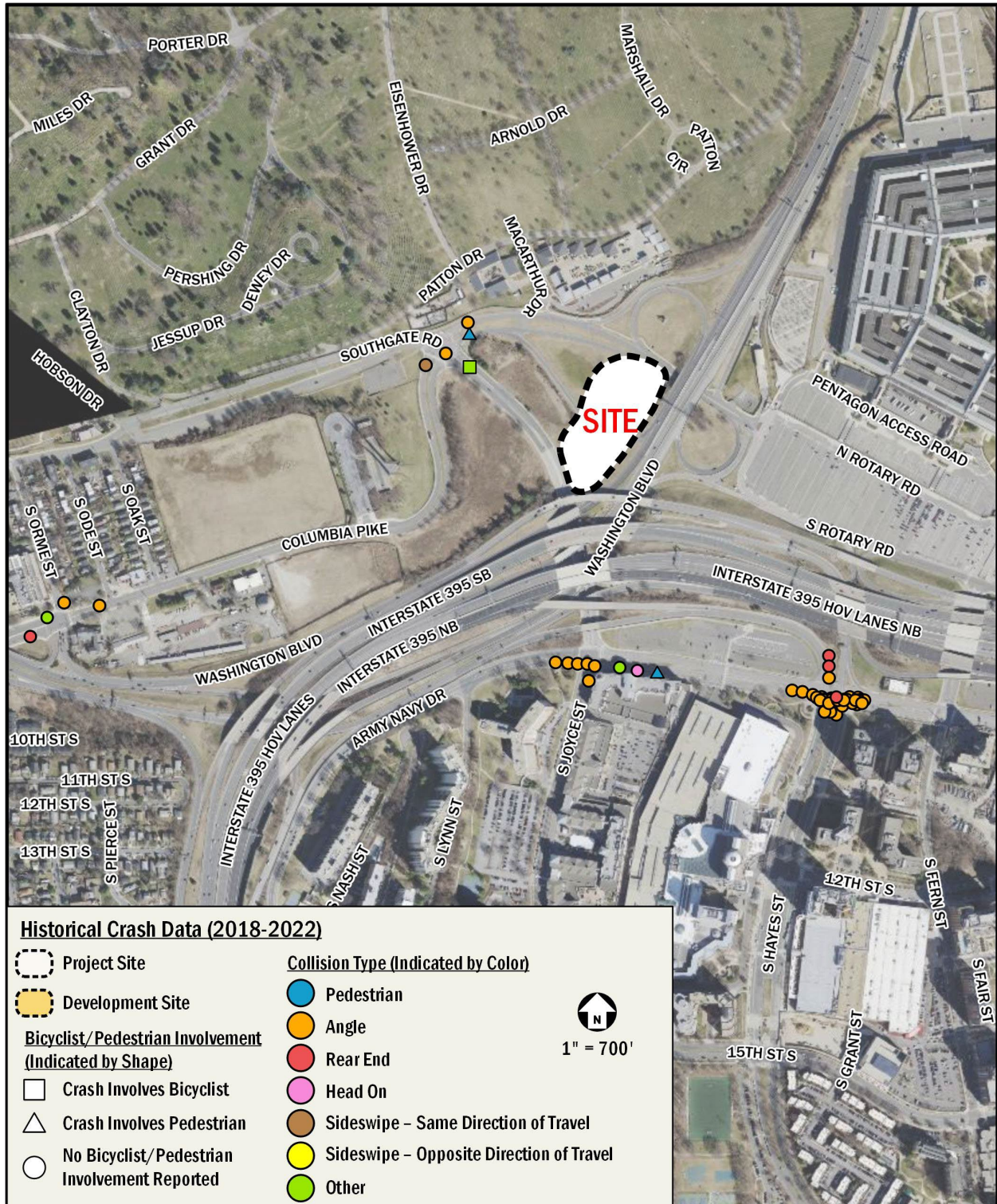


Figure 3-12 - Historical Crash Data (2018-2022)

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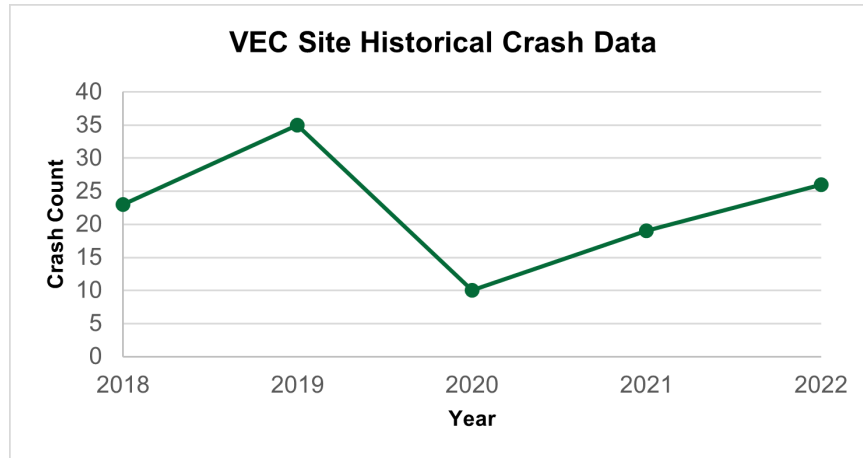


Figure 3-13 - Historical Crash Numbers

Table 2, below, shows the number of crashes according to its severity. No crashes were classified as K (fatal injury) or A (suspected serious injury).

Table 2 - Crash Count by Severity (2018-2022)

Crash Severity	Count	%
K	0	0%
A	2	2%
B	24	21%
C	4	4%
PDO	83	73%
Total	113	100%

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3.9.1.2.4 Parking

The proposed development will provide approximately 100 parking spaces in an on-site surface parking lot. The parking lot will be accessed at two locations along the site's internal roadway; the northern access point will be a dual entry/exit into the parking lot, and the southern access point will be exit-only. The parking lot will be access-controlled and limited to visitors of the VEC or the Pentagon 9/11 Memorial. **Figure 3-14** shows the location of the parking access points.

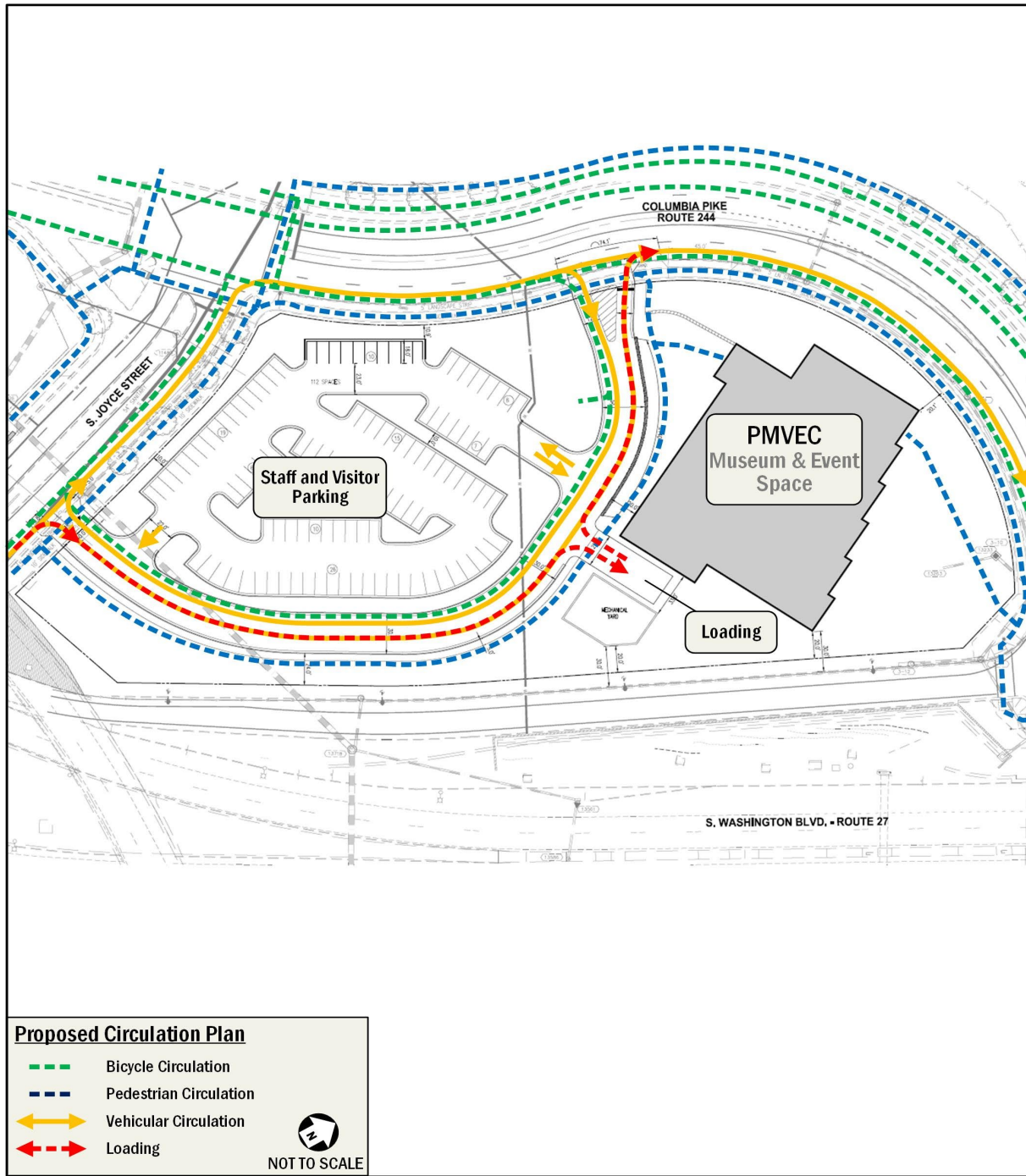


Figure 3-14 - Proposed Circulation Plan

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3.9.1.2.5 Pedestrian and Bicycle Circulation

Pedestrian and bicycle circulation paths within and adjacent to the VEC are illustrated in **Figure 3-14** above. Most visitors and staff will enter the building via the entrance located at the southwest side (parking lot side) of the building. A second pedestrian entrance will be located at the northeast elevation of the building. The existing pedestrian facilities around the site provide an adequate walking environment but will be improved as part of the DAR project and will include widened sidewalks on both sides of S. Joyce Street and both sides of Columbia Pike, improving the site's connections to the Pentagon and Pentagon City. These facilities will provide a more inviting pedestrian environment and comply with the improvements laid out in the Arlington Master Transportation Plan (MTP).

New pedestrian facilities are expected to meet or exceed Arlington County requirements with an emphasis on pedestrian safety and comfort. This includes sidewalks that meet or exceed the width requirements, crosswalks at all necessary locations, and curb ramps with detectable warnings.

There is one existing Capital Bikeshare station with 16 available bicycle docks within a half-mile of the site, located along S. Joyce Street. The greater Pentagon City and Crystal City area have access to more Capital Bikeshare stations, which provide greater connectivity to the entire Washington Metropolitan Area.

3.9.1.2.6. Planned Bicycle Facilities

Existing bike facilities have been recommended by the MTP to be upgraded in the future. The plan makes the following recommendations:

- Implement wide multi-use trails, or wide sidewalks, along at least one side of Columbia Pike, in the areas east of S. Wayne Street and west of Four Mile Run, to serve both bicycle and pedestrian travel. Improvements will be implemented in conjunction with other streetscape improvements and the east end realignment of Columbia Pike.
- Construct a trail parallel to the east wall of Arlington Cemetery to link Columbia Pike to Memorial Drive. Connecting the trail installation with the reconfiguration of the east end of Columbia Pike.
- Reconstruct Army Navy Drive to include bi-directional, protected bicycle lanes from S. Joyce Street to 12th Street S.
- Construct an off-street cycle track connecting the planned Army Navy Drive protected bicycle lane at 12th Street S to 18th Street S and the Crystal City Metrorail station.
- Upgrade the existing bicycle lanes on S. Joyce Street and 15th Street S between Army Navy Drive and S Hayes Street to include more separation from motor vehicle traffic.
- Develop an enhanced bicycle facility on S Fern Street between the Pentagon reservation and 18th Street South.

The Crystal City Sector Plan makes the following recommendations for roadways in the vicinity of the site:

- Extending on-street routes along S Fern Street;
- Adding on-street routes along 12th Street S from S Hayes Street to S Clark Street; and
- Adding bicycle lanes along Army Navy Drive between S Hayes Street and 12th Street S.

The Pentagon City Sector Plan makes the following recommendations for roadways in the vicinity of the site:

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- Adding a separated bikeway along S Hayes Street.
- Adding a separated bikeway along S. Joyce Street.
- Optimize connections to planned bike facility improvements along Army Navy Drive and Columbia Pike.

As part of the DAR project, an off-street cycle track will be constructed on the north side of Columbia Pike between Washington Boulevard and S Nash Street. The eastern end of this facility will connect users to the Washington Boulevard Sidepath and the future Arlington National Cemetery Wall Trail.

Several other bicycle infrastructure improvements are planned in the study area as parts of other planned projects:

- As part of the S Eads Street Complete Street project, buffered bicycle lanes will also be installed on the east side of S Eads Street from Army Navy Drive to 12th Street S.
- As part of the Army Navy Drive Complete Street project, separated two-way bicycle lanes will be installed along the south side of Army Navy Drive between S. Joyce Street and 12th Street S.
- As part of the PenPlace development, a northbound protected bicycle lane along the eastern side between Army Navy Drive and 12th Street S and a southbound protected bicycle lane along the western side between Army Navy Drive and 11th Street S will be provided.

Planned bike facilities are shown in **Figure 3-15**. The proposed off-street trail shown in the figure reflects the routing as shown in in the MTP Bicycle Element; however, this facility is being implemented as part of the DAR project as an off-street cycle track on the north side of Columbia Pike.

As part of the proposed development, short-term bicycle parking spaces will be provided in the landing area located across the internal driveway from the building, as shown in **Figure 3-16**. Bicycle access to the site is primarily expected to occur via the off-street cycle track being constructed on the north side of Columbia Pike as part of the DAR project.

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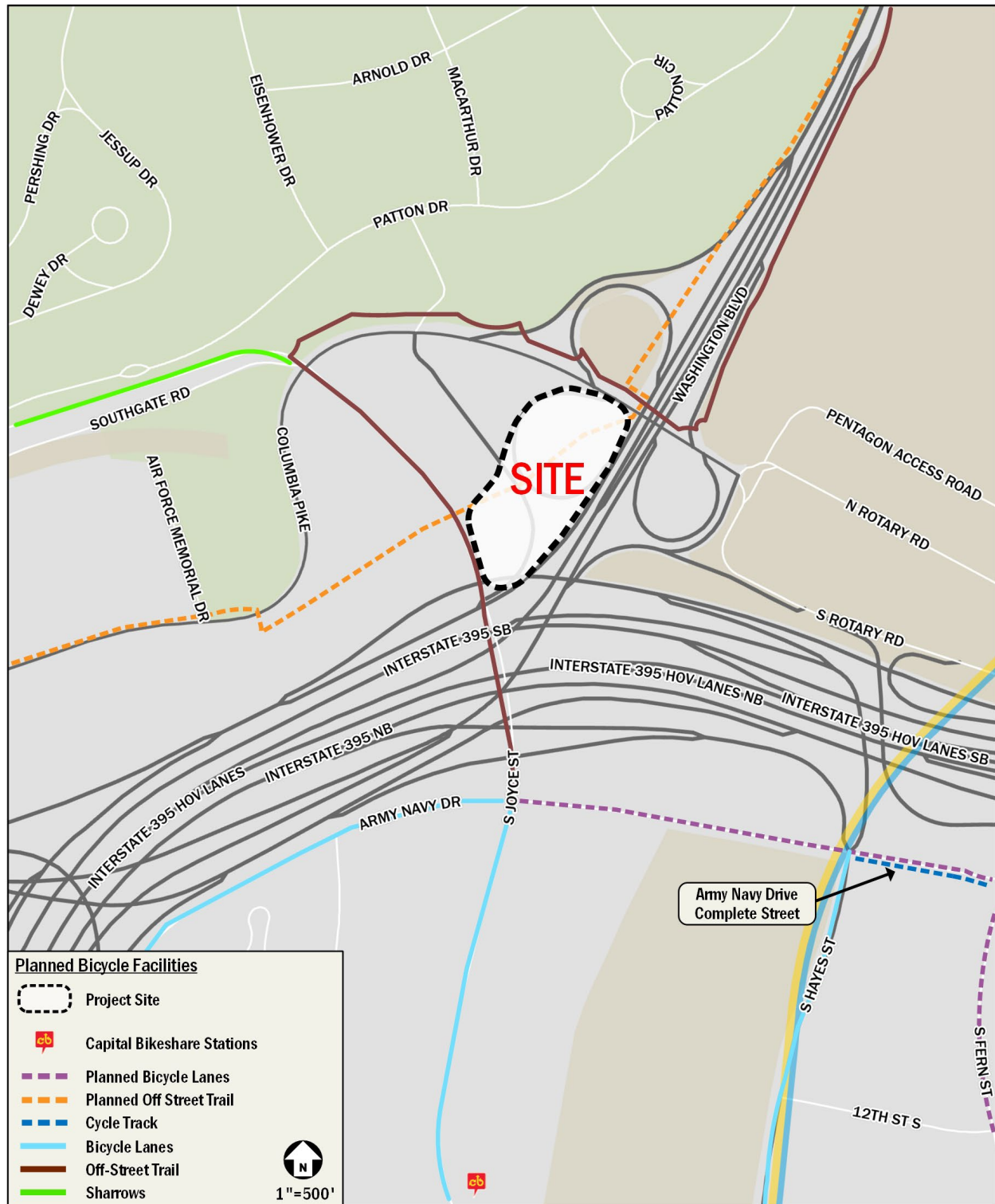


Figure 3-15 - Future Bicycle Facilities

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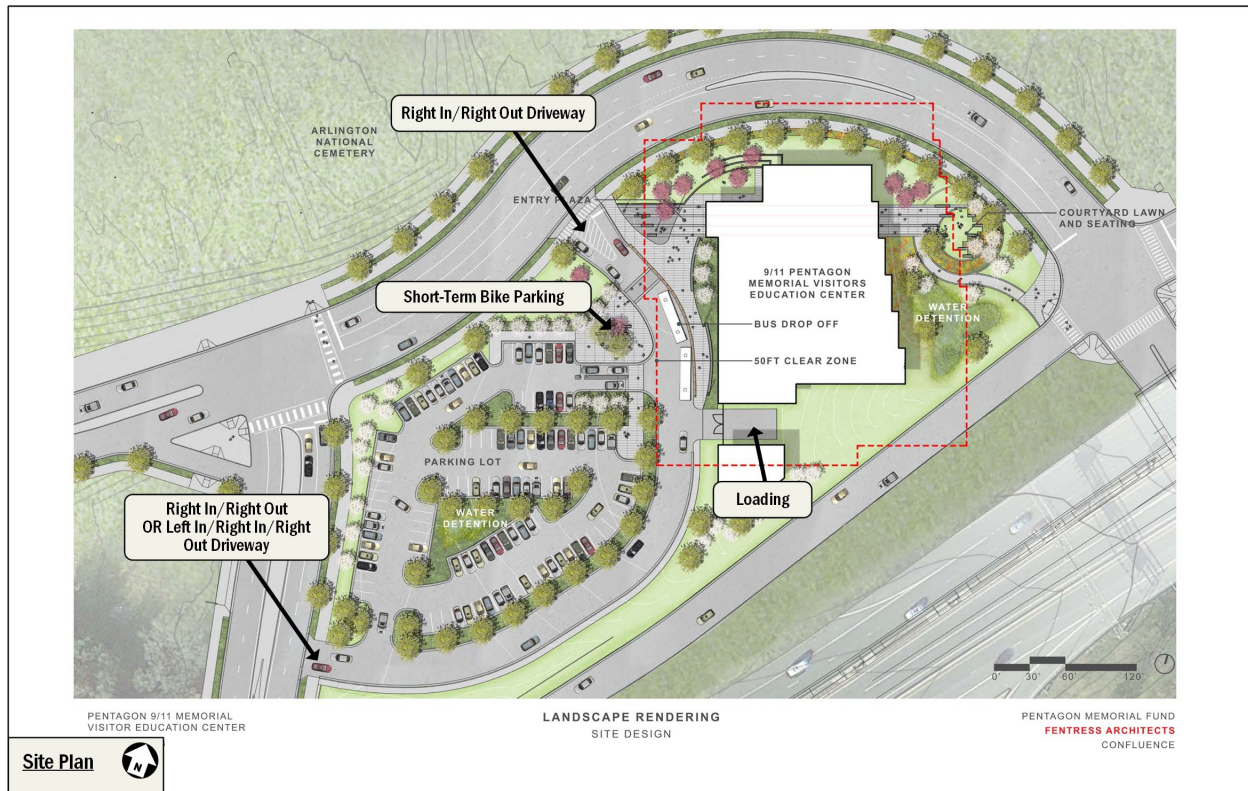


Figure 3-16 - Site Plan

The threshold of significance for traffic impacts is based on Arlington County standards. The proposed development is considered to have an impact at an intersection if any of the following conditions are met:

- The overall intersection or any movement operates at LOS F in the future conditions with the proposed development where it operates at LOS E or better in the background conditions without the proposed development;
- The overall intersection or any movement operates at LOS F during the background condition and the delay increases by more than 10 percent in the future conditions with the proposed development; or
- If any 95th percentile queue length in the future condition exceeds the available capacity where it does not in the background conditions or increases the 95th percentile queue length by more than 150 feet where it already exceeds the available capacity in the background conditions.

3.9.2 Environmental Consequences

3.9.2.1 Alternatives 1, 2, 3 (Preferred), and 4

The potential impacts to transportation and traffic for each of the build alternatives would be similar and thus are analyzed together in this combined section. Traffic modeling was conducted assuming the site access is configured as it is under Alternative 3 (Preferred Alternative). Since each of the other build alternatives (Alternatives 1, 2, and 4) have similar programmatic components in terms of the development program and parking supply provided, it is assumed that the potential impacts to transportation and traffic for each of the build alternatives would be similar and thus are analyzed

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together in this combined section. Under the Preferred Alternative, the proposed development would be constructed with the VEC building located on the northern half of the site (closest to the Pentagon 9/11 Memorial), and with a surface parking lot located on the southern half of the site.

The proposed development will provide approximately 100 parking spaces in an on-site surface parking lot. Access to the site will be provided via driveways on Columbia Pike and S. Joyce Street. In the current layout of alternatives, both of these driveways are designed to be right-in/right-out only. The project team is currently studying the feasibility of an alternative configuration of the S. Joyce Street driveway, in which a median break would be provided on S. Joyce Street to permit southbound left turns into the site. A loading dock will be provided on the south side of the building. The proposed site plan is shown in **Figure 3-16**.

The DAR project will be completing improvements within the public right-of-way in the study area and along the frontages of the site. These include improvements to multimodal infrastructure along Columbia Pike and S. Joyce Street and the curb cuts for the site driveways on Columbia Pike and S. Joyce Street.

3.9.2.1.1 Traffic Conditions

A capacity analysis was developed to compare the future roadway network without the proposed development (background conditions) to the future roadway network with the proposed development (future conditions). Two scenarios were studied for future conditions - one in which the site driveway on S. Joyce Street is right-in/right-out only, and one in which the same driveway is left-in/right-in/right-out only.

Traffic projections for future conditions are based on existing volumes plus inherent growth on the roadway (representing regional traffic growth), traffic generated by approved nearby background developments expected to be completed prior to 2027 (representing local traffic growth), and existing volumes rerouted as a result of background transportation improvements. The methodology of using an inherent growth rate to account for regional growth and background development trips to account for local growth is consistent with other Multimodal Transportation Assessments (MMTAs) in Arlington County and has been vetted and approved by the County.

Traffic projections for the future conditions consist of the existing volumes with four additions:

- Existing volumes rerouted as a result of background transportation improvements;
- Inherent growth on the roadway (representing regional traffic growth);
- Traffic generated by developments expected to be completed prior to 2027 (representing local traffic growth, known as background developments); and
- Trips generated by the proposed development.

Table 3 shows the multi-modal trip generation for the proposed development. Additional details on trip generation methodology and volumes are provided in the full MMTA in **Appendix G**.

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Table 3 – Multi-modal Trip Generation

Mode	Visitor Type	AM Peak Hour			PM Peak Hour			Daily
		In	Out	Total	In	Out	Total	
Auto	Tour Groups	2 veh/hr	1 veh/hr	3 veh/hr	1 veh/hr	2 veh/hr	3 veh/hr	45 veh
	Non-Group Attendees (Residents)	8 veh/hr	1 veh/hr	9 veh/hr	3 veh/hr	10 veh/hr	13 veh/hr	239 veh
	Non-Group Attendees (Tourists)	12 veh/hr	1 veh/hr	13 veh/hr	4 veh/hr	16 veh/hr	20 veh/hr	386 veh
	Event and Facility Rental Attendees (Daytime)	37 veh/hr	6 veh/hr	43 veh/hr	4 veh/hr	35 veh/hr	39 veh/hr	386 veh
	Staff/Employees	4 veh/hr	1 veh/hr	5 veh/hr	2 veh/hr	4 veh/hr	6 veh/hr	51 veh
	Total Proposed	63 veh/hr	10 veh/hr	73 veh/hr	14 veh/hr	67 veh/hr	81 veh/hr	1106 veh
Transit	Tour Groups	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl
	Non-Group Attendees (Residents)	6 ppl/hr	1 ppl/hr	7 ppl/hr	2 ppl/hr	8 ppl/hr	10 ppl/hr	193 ppl
	Non-Group Attendees (Tourists)	12 ppl/hr	1 ppl/hr	13 ppl/hr	4 ppl/hr	15 ppl/hr	19 ppl/hr	374 ppl
	Event and Facility Rental Attendees (Daytime)	20 ppl/hr	4 ppl/hr	24 ppl/hr	3 ppl/hr	19 ppl/hr	22 ppl/hr	210 ppl
	Staff/Employees	8 ppl/hr	3 ppl/hr	11 ppl/hr	3 ppl/hr	10 ppl/hr	13 ppl/hr	122 ppl
	Total Proposed	46 ppl/hr	9 ppl/hr	55 ppl/hr	12 ppl/hr	52 ppl/hr	64 ppl/hr	899 ppl
Bike	Tour Groups	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl
	Non-Group Attendees (Residents)	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl
	Non-Group Attendees (Tourists)	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	12 ppl
	Event and Facility Rental Attendees (Daytime)	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	7 ppl
	Staff/Employees	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	6 ppl
	Total Proposed	3 ppl/hr	3 ppl/hr	6 ppl/hr	3 ppl/hr	3 ppl/hr	6 ppl/hr	25 ppl
Walk	Tour Groups	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl
	Non-Group Attendees (Residents)	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl
	Non-Group Attendees (Tourists)	2 ppl/hr	1 ppl/hr	3 ppl/hr	1 ppl/hr	2 ppl/hr	3 ppl/hr	50 ppl
	Event and Facility Rental Attendees (Daytime)	3 ppl/hr	1 ppl/hr	4 ppl/hr	1 ppl/hr	3 ppl/hr	4 ppl/hr	28 ppl
	Staff/Employees	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	12 ppl
	Total Proposed	6 ppl/hr	3 ppl/hr	9 ppl/hr	3 ppl/hr	6 ppl/hr	9 ppl/hr	90 ppl

Two scenarios were studied for future conditions: one in which the site driveway on S. Joyce Street is right-in/right-out only, and one in which the same driveway is left-in/right-in/right-out only.

Traffic impacts were identified based on the Arlington County standards described in an earlier section (see the end of Section 3.9.1). Following these guidelines, there are impacts to one intersection under both future conditions scenarios (Right-In/Right-Out (RIRO) Only Access on S. Joyce Street and Left-In/Right-Out (LIRO) Only Access on S. Joyce Street). Mitigation measures were tested at this intersection, with results detailed in the full MMTA provided in **Appendix G**. The following impacts and mitigation measures were identified:

- Army Navy Drive & S Hayes Street
 - Under future (2027) RIRO and LIRO conditions, during the morning peak hour, delay for the northbound left movement, which is at LOS F in background conditions, increases by more than 10 percent in comparison to background conditions.
 - The increases in delay at this intersection attributable to the proposed development can be mitigated through signal timing adjustments.

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3.9.2.1.2 Pedestrian and Bicycle Circulation

The Preferred Alternative would maintain the connections to the pedestrian and bicycle network in the area that will be developed as part of the DAR project. Improvements to the pedestrian facilities adjacent to the site will meet or exceed Arlington County and ADA requirements. On-site pedestrian facilities will provide connections to the sidewalk network. Short-term bicycle parking spaces will be provided on site. The Preferred Alternative would not sever any existing connections for bicycles and pedestrians.

3.9.2.1.3 Parking

The proposed development will provide approximately 100 parking spaces in an on-site surface parking lot. The limited amount of on-site parking will promote the use of non-auto modes of travel to and from the proposed development.

3.9.2.1.4 Safety

According to the VDOT historical crash data for the study area, the location with the greatest number of reported crashes was the intersection of S Hayes Street and Army Navy Drive, with 91 of the 113 (or 80%) reported crashes occurring at or near this intersection. No crashes were classified as K (fatal injury) or A (suspected serious injury).

As part of the DAR project, new pedestrian facilities that meet or exceed Arlington County requirements will be provided along the street frontage of the site. These improvements are consistent with several County-wide and national guidelines which prioritize shifting trips to non-auto modes, complete streets principles, and safety for all users, including the Arlington MTP, Vision Zero Action Plan, and NACTO Urban Streets Design Guide. The project does not propose changes to nearby intersections or the roadway network. As such, no change is anticipated to the crash rates in the vicinity of the site.

Therefore, the proposed action is not anticipated to have significant impacts to transportation and traffic, pedestrian and bicycle circulation, parking, and safety.

3.9.2.2 No Action Alternative

Under the No Action Alternative, the proposed VEC site would not be developed. As a result, there would be no expected changes to levels of service for vehicular traffic from background conditions since the undeveloped site would not generate any trips.

Since the DAR project will be constructing bicycle and pedestrian improvements along the site frontages on S. Joyce Street and Columbia Pike, the No Action Alternative would still include these improvements and would not result in the severing of existing pedestrian or bicycle connections.

3.10 Airspace

Navigable airspace is defined as the airspace needed to ensure safety in the takeoff, landing, and operation of aircraft. Congress has charged the Federal Aviation Administration (FAA) with regulating navigable airspace in the public interest as necessary to ensure the safety of aircraft and its efficient use under Federal Regulation Title 14 Part 77 - Safe, Efficient Use and Preservation of Navigable Airspace. Any proposed structures that exceed “notice surface” criteria or are within airport instrument approach areas (IAAs) per 14 CFR Part 77 Section 77.9 must undergo aeronautical study to ensure they would not have an adverse effect on the safety and efficiency of air navigation if they exceed 60 feet AMSL for the

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notice surface criteria or 14 feet AMSL for the IAA criteria (National Landing Master Plan Project, Arlington County, VA, February 10, 2021).

3.10.1 Affected Environment

From its closest property line, the proposed VEC project area is located approximately 5,830 feet northwest of the nearest runway of the Ronald Reagan Washington National Airport. It lies within both the “notice surface” and the IAA for the airport, and thus an aeronautical study was required because the proposed alternatives each exceed the surface and IAA criteria. The FAA conducted the study based upon the Preferred Alternative’s proposed height of 102 feet AMSL.

3.10.2 Environmental Consequences

3.10.2.1 Alternative 1

The proposed building height of the Visitor Center under Alternative 1 would be 105 feet AMSL. The FAA’s study resulted in a Determination of No Hazard to Air Navigation, dated October 25, 2023, which was conducted for the Preferred Alternative’s proposed elevation of 102 feet AMSL. Therefore, it is highly unlikely that Alternative 1’s proposed elevation of 105 feet AMSL, just slightly higher than the Preferred Alternative, would exceed obstruction standards, and thus there are no significant impacts to airspace anticipated from Alternative 1.

3.10.2.2 Alternative 2

The proposed building height of the Visitor Center under Alternative 2 would be 126 feet AMSL. The FAA’s study resulted in a Determination of No Hazard to Air Navigation, dated October 25, 2023, which was conducted for the Preferred Alternative’s proposed elevation of 102 feet AMSL. Therefore, it is unlikely that Alternative 2’s proposed elevation of 126 feet AMSL, which is only 24 feet higher than the Preferred Alternative, would exceed obstruction standards, and thus there are no significant impacts to airspace anticipated from Alternative 2.

3.10.2.3 Alternative 3 (Preferred Alternative)

The FAA has issued a Determination of No Hazard to Air Navigation, dated October 25, 2023, for the Preferred Alternative. The document states that the aeronautical study conducted for the project by the FAA “revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation...” The FAA’s study used an assumed elevation of 102 feet AMSL for the Preferred Alternative (see **Appendix H**); therefore, there are no significant impacts to airspace anticipated from the Preferred Alternative.

3.10.2.4 Alternative 4

The proposed building height of the Visitor Center under Alternative 4 would be similar to Alternative 1 (105 feet AMSL), and thus it is highly unlikely that Alternative 4’s proposed elevation of 105 feet AMSL would exceed obstruction standards as determined by the FAA. Therefore, there are no significant impacts to airspace anticipated from Alternative 4.

3.10.2.5 No Action Alternative

In the absence of any new buildings being built under the No Action Alternative, there are no impacts to airspace that could occur from the No Action Alternative.

3.11 Utilities

3.11.1 Affected Environment

Utilities include resources (public services) that support the construction and operation of infrastructure and facilities. ANC is served by underground utilities including but not limited to electric, water, communication, natural gas, sanitary sewer, and stormwater from the following providers. Dry utilities are illustrated in **Figure 3-17** and wet utilities are illustrated in **Figure 3-18**.

- Electric – Dominion Electric
- Water – Arlington County via DC Water and the U.S. Army Corps of Engineers Washington Aqueduct
- Communication – Verizon, Arlington County, Pentagon, Jones, Fiberlite
- Natural Gas – Washington Gas
- Sanitary Sewer – Arlington County
- Stormwater – ANC and Arlington County

This section discusses utilities that will be in place within the project area and along roadways immediately adjacent to the project area following the DAR project. At the time of this analysis the DAR project is under construction but will be completed prior to construction of the VEC. Therefore, the location of utilities following the DAR project are considered the ‘existing condition’ for this analysis as discussed below. Additionally, this section analyzes potential effects to the stormdrain network; stormwater management is analyzed in Section 3.5. The threshold of significance for utility impacts would be exceeded if an alternative causes a long-term disruption to utility services in neighboring areas or results in an increase in demand that would require substantial utility upgrades and improvements.

3.11.1.1 Electric

Electric service is supplied by underground lines along S. Joyce Street, Columbia Pike, and the ramp to South Washington Boulevard, surrounding the VEC site. Three transformers are adjacent to the VEC site: one along S. Joyce Street near the South Washington Boulevard overpass, one at the intersection of S. Joyce Street and Columbia Pike, and one near the intersection of Columbia Pike and the ramp to South Washington Boulevard. No electric lines are located within the VEC site.

3.11.1.2 Water

Two underground lines provide potable water in the project area. The Washington Aqueduct waterline bisects the VEC site and crosses under both Columbia Pike and the ramp to South Washington Boulevard. The invert of the aqueduct under the VEC site is at an elevation of approximately 44 feet. The other water main runs along S. Joyce Street and crosses underneath Columbia Pike.

3.11.1.3 Communication

Communication services are provided along S. Joyce Street and Old Columbia Pike, primarily in areas to the south and north of the site. Fiber lines are located along S. Joyce Street and Old Columbia Pike along the southern and northern perimeter, and handholes for cable television and Verizon telephone are located within the project area near the intersection of S. Joyce Street and Old Columbia Pike.

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3.11.1.4 Natural Gas

A 12-inch underground natural gas line runs underneath the middle of Columbia Pike along the northern and western perimeter of the VEC site. No underground gas lines are located within the project area.

3.11.1.5 Sanitary Sewer

A 54-inch sanitary sewer runs underneath the middle of S. Joyce Street. No sanitary sewer lines are located within the project area.

3.11.1.6 Stormwater

Underdrains for curb and gutter are located along all roadways bounding the project area. Additionally, a 48-inch underground storm drain pipe crosses underneath the project area from west to east from S. Joyce Street to the ramp to South Washington Boulevard; the invert elevation of this pipe ranges from approximately 50.75 feet underneath S. Joyce Street to approximately 48.43 feet underneath the ramp to South Washington Boulevard. There is also a 15-inch storm drain pipe that runs along the northern portion of the project area underneath Old Columbia Pike. This storm drain is joined by another 15-inch pipe that is located within the project area at the intersection of Old Columbia Pike and the ramp to South Washington Boulevard. Within the project area, two storm drain inlets drain into the 15-inch pipe located within the project area. The invert of one inlet is at an elevation of approximately 29.3 feet and the invert of the downstream inlet is at an elevation of approximately 27.2 feet.

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Figure 3-17 – Dry utilities surrounding the Project Site

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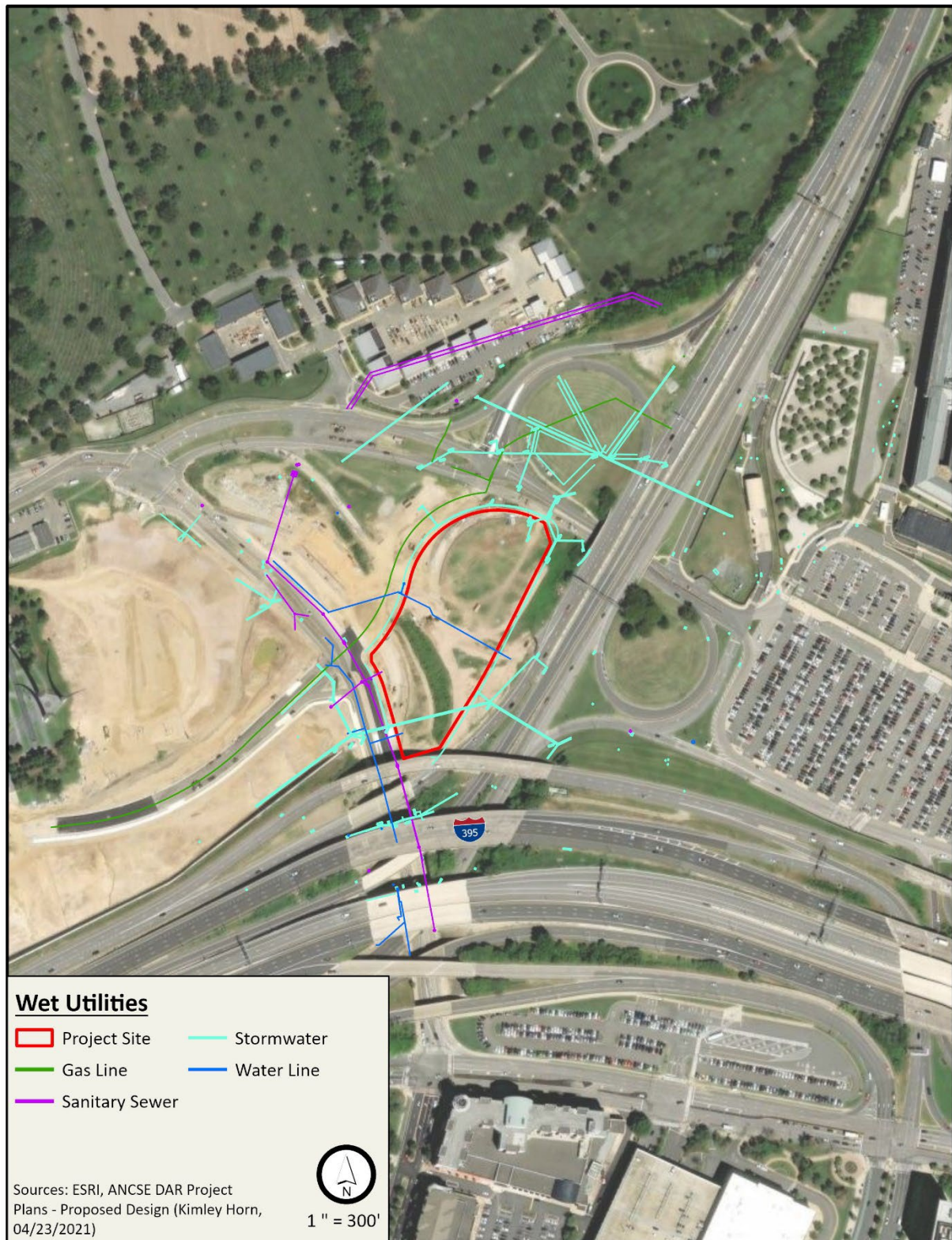


Figure 3-18 – Wet utilities surrounding the Project Site

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3.11.2 Environmental Consequences

Potential impacts to utilities for each of the build alternatives during construction and operation would be similar and thus are analyzed together, below.

3.11.2.1 Electric

Electric service would be provided to the VEC to provide internal and external power for lighting and other general operations, including but not limited to, communications, elevators, and security. Relocation of existing electric service is not anticipated to be necessary with any of the action alternatives.

During construction, connection to the power grid and the installation of a transformer dedicated to the VEC would be necessary, which may require a short-term, temporary disruption to the local power grid during the connection. To mitigate impacts to ANC and surrounding communities, notice of an interruption and its expected duration to all affected customers would be coordinated with Dominion Electric prior to performing the work. Additionally, it is assumed that construction contractors would use diesel, propane, or battery-powered construction equipment, including the use of portable generators, as much as possible during construction.

In accordance with the *United Facilities Criteria (UFC), High Performance and Sustainable Building Requirements*, dated December 1, 2020, Change 02, June 1, 2022, the VEC must meet the U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) silver rating, which includes performance requirements for energy efficiency. Therefore, long term impacts during operations of the building are not expected to place any undue burden on service in the project area and surrounding communities and electric service in the project area is considered to be adequate for the VEC. Consequently, no improvements or upgrades are anticipated to be necessary for any of the action alternatives.

3.11.2.2 Water

Potable water would be provided to the VEC for general operations, fire suppression, and an external hydrant. Although the Washington Aqueduct bisects the site, relocation would not be required and disturbance to the line is not anticipated due to its depth. Similarly, relocation of the water main under S. Joyce Street would not be necessary under any of the action alternatives.

During construction, connection to a stub out from the water main along S. Joyce Street to be provided by the DAR project and the installation of metering equipment for the VEC would be necessary, which may require a short-term, temporary disruption during the connection. To mitigate impacts to ANC and surrounding communities, notice of an interruption and its expected duration to all affected customers would be coordinated with Arlington County prior to performing the work. Additionally, it is assumed that concrete to be poured on site would arrive pre-mixed and an on-site washout for concrete trucks would not be utilized. Should water be necessary for dust control during construction, water trucks would be filled at an off-site location.

The *UFC High Performance and Sustainable Building Requirements*, dated December 1, 2020, Change 02, June 1, 2022, require the VEC to meet the LEED silver rating, which includes performance requirements for internal and external water conservation. Therefore, long term impacts during operations of the building are not expected to place any undue burden on service in the project area and surrounding

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communities and potable water service in the project area is considered to be adequate for the VEC. Consequently, no improvements or upgrades are anticipated to be necessary for any of the action alternatives.

3.11.2.3 Communication

Communication services for telephone and cable television would be provided to the VEC for general operations and security. Relocation of existing communication utilities is not anticipated to be necessary with either alternative, and the VEC is not expected to place any undue burden on service in the project area and surrounding communities. Therefore, improvements or upgrades are not anticipated to be necessary for any of the action alternatives.

During construction, connections to handholes for telephone and cable television to put in place within the VEC site during the DAR project would be necessary, which may require a short-term, temporary disruption during the connection. To mitigate impacts to ANC and surrounding communities, notice of an interruption and its expected duration to all affected customers would be coordinated with Verizon and the cable television provider prior to performing the work.

3.11.2.4 Natural Gas

Natural gas would be provided to the VEC for general building operations. Relocation of existing natural gas service is not anticipated to be necessary with any of the action alternatives.

During construction, connection to the gas main along Old Columbia Pike and the installation of metering equipment would be necessary, which may require a short-term, temporary disruption during the connection. To mitigate impacts to ANC and surrounding communities, notice of an interruption and its expected duration to all affected customers would be coordinated with Washington Gas prior to performing the work.

The *UFC High Performance and Sustainable Building Requirements*, dated December 1, 2020, Change 02, June 1, 2022, require the VEC to meet the LEED silver rating, which includes performance requirements energy performance. Therefore, long term impacts during operations of the building are not expected to place any undue burden on service in the project area and surrounding communities and natural gas service in the project area is considered to be adequate for the VEC. Consequently, no improvements or upgrades are anticipated to be necessary for any of the action alternatives.

3.11.2.5 Sanitary Sewer

Sanitary sewer service would be provided to the VEC for general building operations. Relocation of existing sanitary sewers is not anticipated to be necessary, and sanitary sewer service in the project area is considered to be adequate for the VEC, which is not expected to place any undue burden on service in the project area and surrounding communities. Therefore, improvements or upgrades are not anticipated to be necessary for any of the action alternatives.

During construction, connection to a sanitary lateral stub out from the sanitary sewer system along S. Joyce Street to be provided by the DAR project for the VEC would be necessary, which is not expected to cause any disruption during the connection.

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3.11.2.6 Stormwater

Neither relocation nor disturbance to the 48-inch underground storm drain pipe would occur under either alternative due to its depth. Following treatment by on-site stormwater management, stormwater from the site would discharge into the 15-inch underground storm drain pipe located within the property near the intersection of Old Columbia Pike and the ramp to South Washington Boulevard – a portion of this pipe would be abandoned within the property; however, the storm drain network downstream of the property would not be affected and no upgrades or improvements would be necessary under any of the action alternatives.

3.11.2.6 No Action Alternative

Under the No Action Alternative there would be no new utility upgrades and improvements required for the project and no long-term disruption of service to neighboring areas, therefore no significant impacts would occur.

3.12 Hazardous and Toxic Materials and Waste

3.12.1 Affected Environment

Hazardous and toxic materials are substances that pose a substantial threat to human health or the environment and are regulated at the federal level under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and the state level under Title 9 of the Code of Virginia. Solid waste is also regulated at the federal level under RCRA and at the state level under Title 9 of the Code of Virginia. This section analyzes the potential exposure of hazardous and toxic materials during construction and operations as well as the management of solid waste. The threshold of significance for hazardous and toxic materials would be exceeded if an alternative results in a substantial increase in hazardous waste generation or results in violations of RCRA, CERCLA, or other applicable state laws. Additionally, ANMC considers the threshold of significance for solid waste to be exceeded when the diversion rate of nonhazardous solid waste is below 50% (Southern Expansion EA, 2019).

3.12.1.1 Hazardous and Toxic Materials

The southwestern portion of the VEC site along S. Joyce Street is located in an area previously within the Navy Annex area. As documented in the Southern Expansion EA, hazardous materials including petroleum products, above ground storage tanks, underground storage tanks, and buildings with asbestos containing materials were present in the Navy Annex area prior to demolition in 2013. Subsequent to demolition efforts, the Washington Headquarters Services completed a limited soil remediation of asbestos containing materials in 2015 due to their presence in soils. Additional soil sampling was performed in 2016 to assess potential environmental impacts during construction of the Southern Expansion project, which indicated low levels of arsenic, chromium, and polycyclic aromatic hydrocarbons (PAH) in the soil.

3.12.1.2 Solid Waste

Non-hazardous solid waste is not located within the VEC site under existing conditions.

3.12.2 Environmental Consequences

Potential impacts from the generation of hazardous and toxic materials and solid waste for each of the build alternatives would be similar and thus are analyzed together below.

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3.12.2.1 Hazardous and Toxic Materials

The risk of exposure to previously documented hazardous materials in the southwestern portion of the site is low based on remedial efforts completed to date. Should contaminated soils be encountered during soil investigations and construction activities, these soils would be handled per federal and state regulations and OSHA standards would be followed for worker safety. Primary hazardous and toxic materials due to construction activities would include petroleum, oils, lubricants, paint, and solvents. To mitigate the risk of environmental exposure, a Spill Prevention, Control, and Countermeasure Plan would be established, and the construction contractor would be responsible for following the plan as well as any remedial action. Additionally, a construction waste management plan per LEED silver rating requirements would be developed that addresses the safe removal and disposal of hazardous and toxic materials. Therefore, any impacts during construction would be considered short-term and minor.

During the operations phase, storage of hazardous materials such as paints, batteries, oils/greases, pesticides, and herbicides may be stored onsite but would be contained within enclosed and locked areas. Per LEED silver rating requirements, recycling of hazardous materials such as batteries and paints would be implemented under a recycling and waste management plan, the elements of which are briefly discussed, below. Therefore, the VEC is not expected to result in a significant increase in the generation of hazardous and toxic materials over the long-term during operations.

3.12.2.2 Solid Waste

Both construction and operations phases of the VEC would result in the generation of solid waste. Solid waste generated during construction would be temporary and likely include concrete, asphalt, steel, metals, vegetation, paper, cardboard, glass, plastics, and unsuitable or excess soil. Per requirements of the LEED silver rating, a construction waste management plan including the following would be developed:

- Identification of an overall project waste diversion goal.
- Identification of at least five construction or demolition material streams for diversion from landfill, including the means and methods of diversion for each and the approximate amount of waste of each. This may include a combination of on-site separation and comingled collection.
- Identification of diversion options for all materials, including land-clearing debris.
- Requirement for a final report documenting the total construction and demolition waste produced by the project and the total waste diverted.

By adhering to the construction waste management plan developed for the project, a significant increase in the short-term generation of solid waste during construction is not expected.

Solid waste expected to be generated during operations would likely include metals, vegetation, paper, cardboard, glass, plastics, and other general refuse such as food waste. A recycling and waste management plan would also be developed in accordance with LEED silver rating requirements and would include the following:

- Identification of possible waste types and quantities that may be generated by different spaces within the building.
- Design of sufficient collection and storage space for recyclables and identification of these on floor plans. These areas must be easily accessible to visitors, staff, and waste haulers.

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- Appropriate measures for hazardous waste streams associated with items such as batteries, electronic waste, and mercury-containing lamps.

Due to the recycling and waste management plan, the VEC is not expected to cause a significant increase in the generation of solid waste over the long term.

3.12.2.3 No Action Alternative

Under the No Action Alternative, there would be no new generation of hazardous and toxic materials and solid waste for the project area, and therefore no temporary or long-term impacts due to construction activities and operations would occur.

3.13 Visitor Use and Experience

3.13.1 Affected Environment

Part of the mission of ANC is to provide “...a place connecting visitors to the rich tapestry of the cemetery’s living history.” The cemetery receives over three million visitors annually – some are loved ones visiting a family member’s grave site or attending a funeral, while many others are tourists, including students and organized tours, coming to experience some of the primary features and learn about the rich history of the cemetery. The three primary features most often visited are the Tomb of the Unknown Soldier and the Memorial Amphitheater, President Kennedy’s grave site, and the Arlington House. The proposed VEC would be located in the ANC Southern Expansion area but not in the area being developed for additional burial capacity or operations. It will improve the visitor use and experience by providing a suitable public use for the land that provides many visitor amenities, and better connects a variety of public sites, providing connection, amenities, and activities/experiences as visitors flow from Pentagon Row, Pentagon Metro, etc. toward ANC. Also located in this area is the Air Force Memorial that honors the service of the men and women of the United States Air Force and its heritage organizations. When the Southern Expansion project is completed, the proposed site for the VEC will be an open grass area. Due to the site’s physical disconnection from the cemetery, this area was determined to be unsuitable for future interment needs. Consequently, the site is not needed to support the cemetery’s mission and operations and was, therefore, made available for the VEC.

Although air quality, noise, visual effects, and traffic have the potential to affect visitor use and experience, potential effects related to these are discussed above in Section 3. Therefore, this section analyzes other potential effects to visitor use and experience not discussed in those sections. Per the Southern Expansion EA, the threshold of significance for visitor use and experience impacts for the long-term would be if visitors could no longer have access to grave sites or could not experience the primary features of the cemetery. This threshold is expanded to include access to and the ability to experience the Air Force Memorial.

3.13.2 Environmental Consequences

3.13.2.1 Alternative 1

Temporary impacts from dust, trash, and noise may affect the visitor experience during construction due to site grading and building construction. Watering trucks would be used during construction for dust control and solid waste and noise would be controlled as discussed above. Any impacts related to dust, trash, and noise due to construction would be short-term and would cease upon completion of

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construction activities. Construction of the VEC would not preclude access to cemetery grounds or the Air Force Memorial.

Because the existing condition of the VEC site will be an unused open grass area, there would be no impacts to ANC amenities or visitor use and experience. Furthermore, there would be no impact on future burial capacity needs as this area was determined to be unsuitable for interment during planning of the Southern Expansion project. Additionally, because the VEC will have its own dedicated parking area, no impacts to access and parking to other areas in the Southern Expansion area and the Air Force Memorial are expected. That said, the VEC may have beneficial effects to the visitor use and experience in this area as visitors and tours that want to experience both the 9/11 Memorial, Air Force Memorial, and the Southern Expansion area would have additional parking and amenities, including restrooms and a café, available to them.

The VEC will not have a full kitchen, but the planned use of pre-prepared meals is anticipated. This is not expected to cause aroma or odor impacts to other visitors or those to nearby sites such as the Air Force Memorial or ANC and is, therefore, considered insignificant.

Visual effects related to the reflection of sunlight from the building have the potential to affect the use and experience of those in nearby areas. To minimize this effect, the building treatment would include the use of materials that provide an opaque treatment to the glass, which would also minimize the ability of cemetery visitors to see visitors and occupants in the VEC to minimize any effects during moments of contemplation and reflection. As a result, these impacts would be insignificant.

3.13.2.2 Alternative 2

Temporary impacts under Alternative 2 would be similar to those under Alternative 1. Long-term effects under Alternative 2 during the operations phase would be similar to Alternative 1 except for potential effects related to the rooftop deck that could be used during off-hours when the conference space is being utilized. Potential effects during use of the roof-top deck would be related to visual effects and noise. To minimize these effects to visitors of the cemetery and Air Force Memorial, use of this area would be limited to off-hours when the cemetery is closed.

3.13.2.3 Alternative 3 (Preferred Alternative)

Temporary and long-term impacts due to construction and operations under Alternative 3 would be similar to Alternative 1.

3.13.2.4 Alternative 4

Temporary and long-term impacts due to construction and operations under Alternative 4 would be similar to Alternative 2; however, the long-term impacts during the operations phase may be less due to the lower overall elevation of the building height and rooftop deck.

3.13.2.5 No Action Alternative

Under the No Action Alternative, there would be no development on-site associated with any planned VEC and, as a result, there would be no effects to the visitor use and experience to other areas of the cemetery, including the Air Force Memorial.

3.14 Issues Considered but Eliminated from Detailed Discussion

In the ISOWPP, three Resource Areas were deemed to require a Level of Analysis considered “Very Low” because the anticipated Issues, Concerns, and Risks associated with each were either non-existent and/or there was no potential to impact the Resources based upon the nature of the Alternatives being considered. Those Resource Areas include the following, with a brief description of their disposition in this EA:

- Geological and Soil Resources - Because any of the build alternatives will include disturbance of soils at the project area, this EA briefly addresses the potential impacts to Geological and Soil Resources in section 3.4, above.
- Electromagnetic Spectrum – This Resource Area has been eliminated from detailed discussion in this EA.
- Human Health & Safety - This Resource Area has been eliminated from detailed discussion in this EA.

Other Resource Areas were not considered because they are not present and, therefore, not relevant to the decision-making process for this project. Such Resource Areas include wild and scenic rivers, fisheries, unique ecosystems, and biosphere reserves.

3.15 Other NEPA Considerations

3.15.1 Unavoidable Adverse Impacts

The proposed action is anticipated to cause minor, temporary adverse environmental effects related to construction. Any potential construction impacts, such as those due to increases in dust, emissions from construction equipment, and utility interruptions, would be temporary in nature and restricted to the construction site and nearby or adjacent areas. Construction contractors would be required to comply with the Fugitive Dust/Fugitive Emissions Rule (9VAC5-50-60, et seq) during construction activities.

The installation and use of ASTs (> 660 gallons) for temporary fuel storage (> 120 days) during construction would follow the requirements in 9VAC25-91-10 et seq. Any USTs uncovered during construction must be reported to VDEQ, and any petroleum releases during construction must be reported to VDEQ as required by 9VAC 25-580-10 et seq.

3.15.2 Regulatory Compliance

There are a number of Federal and State statutes that exist to protect a variety of environmental resources as well as human health and safety. Specific Federal statutes that have relevance to the proposed action and that are addressed in this EA include the Clean Air Act, Coastal Zone Management Act, Endangered Species Act, Noise Control Act, National Environmental Policy Act, and Section 106 of the National Historic Preservation Act. This EA has addressed the proposed action’s compliance with the first four laws in this list in the narratives above. By virtue of its existence and approval, this EA was prepared to satisfy the requirements of NEPA. To comply with Section 106 of the NHPA, significant efforts were taken and those are documented in Section 3.7. In addition, project sponsors have taken considerable effort to comply with regulatory oversight and guidance provided by the U.S. Commission of Fine Arts and the National Capital Planning Commission in regard to the design and layout of the

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Preferred Alternative. The proposed action is thus intended to be compliant with applicable Regulatory statutes.

3.15.3 Indirect and Cumulative Effects

Because of the relatedness of the proposed action to the ANC Southern Expansion and the dependency of the proposed action upon the ANC Southern Expansion, this EA incorporates by reference, and borrows liberally from, the discussion of Indirect and Cumulative Effects that appears in the Final EA for the Southern Expansion project. As applicable, this EA also incorporates relevant information from the following NEPA documents that have recently been prepared for projects at ANC:

- Security Upgrade EA
- Confederate Memorial EA
- Programmatic EA For the ANC, Real Property Master Plan

CEQ defines indirect effects as “...effects which are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems.”

CEQ defines cumulative impacts as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what other agency (federal or non-federal) or person undertakes such other actions.” Because cumulative impacts can result from individually minor but collectively significant actions by various agencies, entities, or individuals over time, a cumulative impacts analysis must address the scope of other actions and their relationship to the proposed action if there is an overlap in space and time.

The following questions were considered in identifying the potential for cumulative impacts:

- Would the proposed action affect or interact with the same resources that have been or would be affected by recent past, present, or reasonably foreseeable actions?
- Would the proposed action affect or be affected by the impacts of the other action?
- If an interrelationship exists between the proposed action and other recent past, present, or reasonably foreseeable actions, are there any potential significant impacts not identified when the proposed action is considered alone?

The geographic range for cumulative impacts analysis in the Southern Expansion EA encompasses the cemetery as well as the surrounding community, and this was mirrored for the VEC project, as it would also be located on ANC property. The timeframe for cumulative impacts in the Southern Expansion EA was selected as 2006 (the recent past) to 2023, so as to encompass the anticipated construction start date of 2020 for the expansion project and the reasonably foreseeable future. This cumulative impact analysis for the VEC, therefore, has modified the time horizon and selected for inclusion related actions completed within the past three years as well as those that have a reasonable probability of being completed in the next five years. Further, this EA for the VEC considers the effects of other actions that have a close causal relationship to the proposed action and alternatives. These include Army actions

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located on and adjacent to ANC. The following “new” or proposed project that was not considered in the Southern Expansion EA was identified from Army planning documents.

- Arlington Memorial Trail - The Federal Highway Administration (FHWA) Eastern Federal Lands Highway Division (EFLHD), under agreements with Arlington County, VDOT, and the Department of the Army, is designing a new, multiuse trail facility to provide connectivity for bike-ped users in the ANC area. This trail, in conjunction with the DAR and the Southern Expansion projects, will extend north from the Columbia Pike realignment and will be located along the east perimeter of ANC from the area of the proposed VEC to Memorial Avenue (see **Figure 3-19**).

The proposed action is itself included as a “Reasonably Foreseeable Future Action” that was analyzed in the context of the Southern Expansion project, and the conclusions regarding cumulative effects that appear in the Southern Expansion EA are substantially similar, if not identical to, those that are anticipated for the proposed action. The Southern Expansion EA specifically discussed the proposed action in the context of cumulative effects (including those induced by the Southern Expansion project) for the following Resource Areas: Land Use and Sustainability, Cultural/Historical, Visitor Use and Experience, Traffic and Transportation, Water Resources, and Visual and Aesthetic. The Southern Expansion EA concludes that future actions (including the proposed action) would have no adverse cumulative effects on any Resource Area and, in the case of Land Use and Sustainability and Visitor Use and Experience, would have a net benefit to or be compatible with those resources.

The Arlington Memorial Trail (AMT) project is considered herein for its potential to cause cumulative effects when added to the proposed action, the Southern Expansion, as well as the other projects considered in the Southern Expansion EA. Resource Areas that could be cumulatively affected by the AMT are Land Use, Cultural/Historical, Visitor Use and Experience, and Traffic and Transportation. The AMT is anticipated to have a net beneficial effect on Cultural/Historical, Visitor Use and Experience, and Traffic and Transportation, as it will create convenient connectivities for bicyclists and pedestrians between the ANC, the Pentagon Memorial, the VEC, and the Air Force Memorial. This could also serve to reduce automobile traffic and parking needs at the VEC and other facilities by making it more accessible to bicyclists and pedestrians. The AMT is not anticipated to have any adverse effects to Land Use, as it will be located along the east perimeter of the ANC in narrow ribbon that will be dedicated for such use by the Department of the Army.

The construction and operation activities at the VEC site, combined with the other activities analyzed in the Southern Expansion EA or are described above, will not have a cumulative impact on any environmental resources. This impact is not appreciably greater than that of the individual projects because they are either geographically isolated or their impacts tied to construction are short and temporary in duration.

3.16 Conclusions

Because no significant impacts are anticipated from the proposed action, a Finding of No Significant Impact (FONSI) will be prepared. It will briefly discuss why the proposed action will not significantly affect the environment, include a summary of the EA, and state that an EIS will not be prepared.

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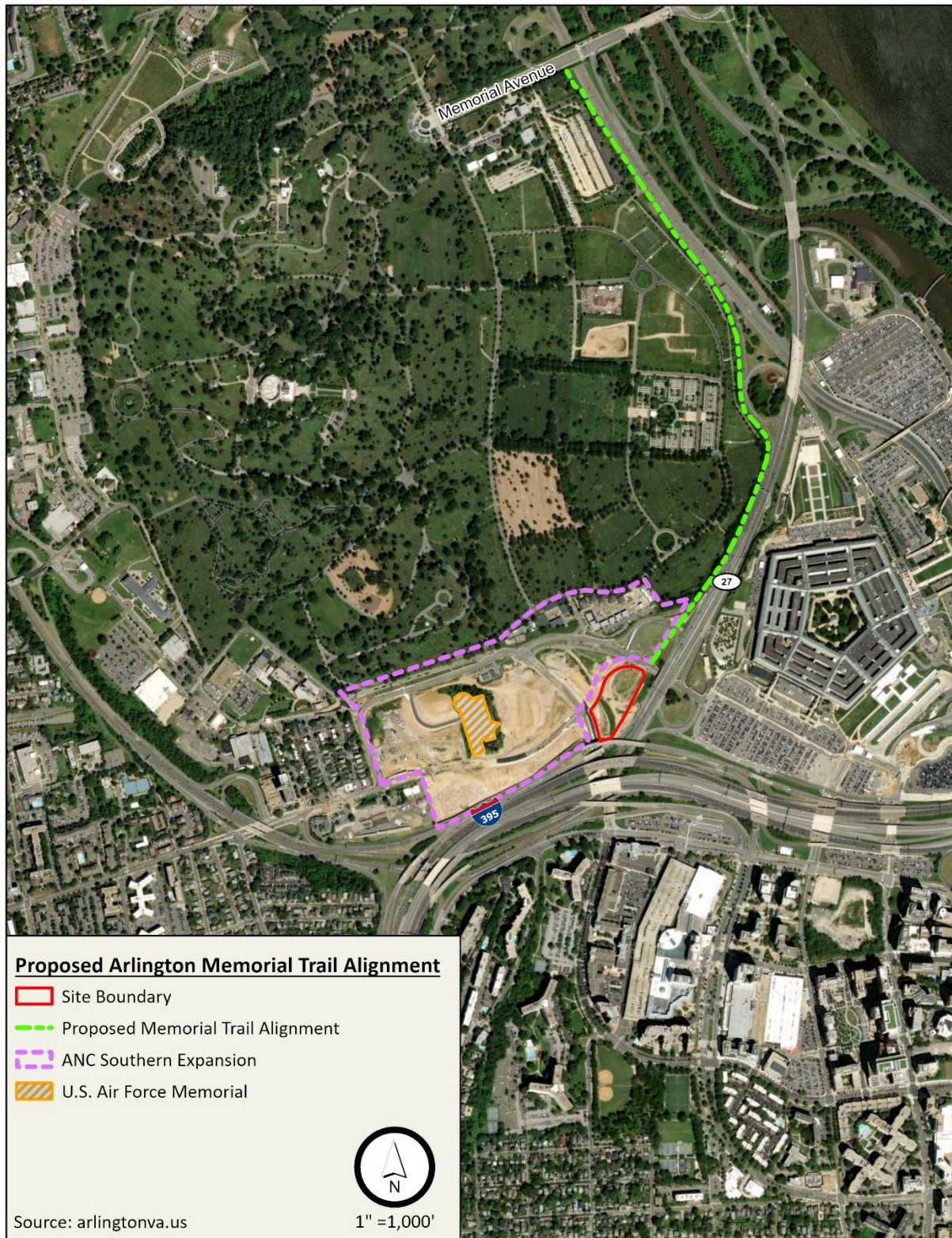


Figure 3-19 - Arlington Memorial Trail Alignment

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The project has incorporated several design changes to the preferred alternative, particularly as a result of the Section 106, CFA, and NCPC coordination processes, that have reduced the impact to historic resources and thus contributed to this Finding. Those changes include:

- Reduction of massing of the building;
- Exclusion of a roof deck from the preferred alternative;
- Selection of construction materials that match the characteristic of the surrounding areas and reduce glare, noise, and light pollution;
- Siting of the building lower in elevation on the site and closer to the memorial in order to reduce impacts to viewsheds;
- Development of interpretation regarding the local community, in particular Queen City and the black communities that have historic ties to the project location.
- Specific management measures and design features as described for certain resource areas, as follows.
 - Deliveries and waste pickup activities will be restricted to off-peak hours to minimize noise impacts as much as possible. During construction, noise levels will be limited by the Arlington County NCO if they are able to be adequately isolated and measured separately from the adjacent highway noise.
 - Pollution prevention and good housekeeping practices will be implemented throughout the VEC site to minimize and prevent water resource impacts. Written procedures, a Stormwater Pollution Prevention Plan, a Nutrient Management Plan, and training will be key parts of the VEC's pollution prevention and good housekeeping program. Clean Water Act permits will be obtained and adhered to for construction (e.g., VPDES permit for Stormwater Discharges from Construction Activities), and design of the VEC will meet both the Virginia Stormwater Management Program (VSMP) Regulation (9 VAC 25-870) and VA Erosion and Sediment Control (ESC) Regulations. Water quality and quantity treatment requirements would be met on site prior to discharge to existing conveyances. Low Impact Development (LID) measures, such as bioretention and a vegetated or "green" roof that reduce runoff will be provided to address both quality and quantity.
 - Construction will adhere to a typical workday, during daylight hours only, to avoid or minimize noise intrusion on nearby residents or burial services.
 - BMPs will be implemented to avoid or minimize impacts caused by fugitive dust, including perimeter fencing or barriers, applying water to disturbed soils or high traveled areas, and reseeded or revegetating disturbed areas.
 - Improvements to the pedestrian facilities adjacent to the site will meet or exceed Arlington County and ADA requirements. On-site pedestrian facilities will provide connections to the sidewalk network. Short-term bicycle parking spaces will be provided on site.
 - The VEC will meet the U.S. Green Building Council's (USBGC) Leadership in Energy and Environmental Design (LEED) silver rating, which includes performance requirements for energy efficiency, waste management, water usage, and other specifications.
 - To mitigate the risk of environmental exposure, a Spill Prevention, Control, and Countermeasure Plan will be established, and the construction contractor will be

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responsible for following the plan as well as any remedial action. Additionally, a construction waste management plan per LEED silver rating requirements would be developed that addresses the safe removal and disposal of hazardous and toxic materials.

- During the operations phase, storage of hazardous materials such as paints, batteries, oils/greases, pesticides, and herbicides may be stored onsite but would be contained within enclosed and locked areas. Per LEED silver rating requirements, recycling of hazardous materials such as batteries and paints would be implemented under a recycling and waste management plan.

4. List of Agencies and Persons Consulted

This chapter identifies the agencies and individuals consulted in the preparation and review of this Environmental Assessment. **Table 4**, below, lists the agencies consulted and the individuals within those agencies. **Table 5** lists the Tribal Organizations that were consulted.

Table 4 - Agencies and/or Persons Consulted

Agency	Contacts
Advisory Council on Historic Preservation	Katharine Kerr
Air Force Memorial / Air Force Association	Major General Joel Jackson
National Association for the Advancement of Colored People, Arlington Chapter	Wanda Younger
Arlington County	Mark Schwartz
Arlington County Department of Environmental Services	Greg Emanuel
Arlington Historic Preservation Program	Cynthia Liccese-Torres
Arlington Historical Society	Cathy Hix
Black Heritage Museum of Arlington	Talmadge Williams
DC Historic Preservation Office	David Maloney
Department of Army	Kathleen McLaughlin
Federal Highway Administration	Monique Evans
Joint Base Myer-Henderson Hall	Kelly Whitton
Metropolitan Washington Council of Governments	Joan Rohlfs
National Capital Planning Commission	Lee Webb
National Park Service	Tammy Stidham
National Trust for Historic Preservation	Matt Virta
Northern Virginia Regional Commission	Robert Nieweg
Pentagon Force Protection Agency	Aimee Vosper
Pentagon Memorial Fund	Lynn Mariano
Preservation Virginia	
U.S. Commission of Fine Arts	Thomas Luebke
U.S. Environmental Protection Agency	Barbara Rudnick, P.G.
U.S. Fish and Wildlife Services	Kyla Hastie
Virginia Department of Conservation and Recreation	
Virginia Department of Historic Resources/State Historic Preservation Office	Marc Holma
Virginia Department of Environmental Quality	
Virginia Department of Transportation	Nick Roper
	Houda Ali
	Randy Hodgson
Virginia Department of Wildlife Resources	Ryan Brown
Virginia Marine Resources Commission	
Washington Headquarter Services/Pentagon Reservation	Cameron DeLancey
Washington Metropolitan Area Transit Authority	Jeffery Winstel

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Table 5 - Native American Tribes

Native American Tribe
Absentee-Shawnee Tribe of Indians of Oklahoma
Catawba Indian Nation
Cayuga Nation
Cherokee Nation
Delaware Nation
Delaware Tribe of Indians
Eastern Band of Cherokee Indians
Eastern Shawnee Tribe of Oklahoma
Oneida Nation
Oneida Tribe of Indians of Wisconsin
Onondaga Indian Nation
Pamunkey Indian Tribe
Saint Regis Mohawk Tribe
Seneca-Cayuga Tribe of Oklahoma
Seneca Nation of Indians
Tonawanda Band of Seneca
Tuscarora Nation
United Keetoowah Band of Cherokee Indians

5. List of Preparers

Name	Role	Years of Experience	Degree(s)
Leyla Lange	Project Manager	29	AA, General Studies BS, Natural Resources Management MS, Marine-Estuarine Environmental Sciences
Russell Ruffing	Technical Writer, QA/QC Review	37	BS, Environmental Resource Management
Michael Cunningham	Technical Writer	25	BS, Environmental Analysis & Planning
Katharine Cline	Historian	7	MS, Historic Preservation; BA, History
Rhiannon Flickinger	Technical Writer	1	MS, Biology; BS, Biology
Adriene Delozier, AICP	Peer Review	17	MS, Geography & Planning BS, Geography & Planning

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Appendix A

Public Comment Matrix and
Correspondence

Agency	Comment ID	Response Date	Category 1	Category 2	Category 3	Comment	Responsibility	Response
Air Force District of Washington	AFDW-01	11/28/2022	NEPAProcess			<p>1. The AFDW, acting on behalf of the Air Force, will participate in the NEPAanalysis and assessment for the PMF VEC. We look forward to the scoping meeting on December 12, 2023 at Arlington National Cemetery.</p> <p>2. My point of contact is Ms. Marcelyn “Marcy” Atwood, at marcelyn.atwood.2@us.af.mil or via her mobile 202-521-3397. Ms. Atwood will coordinate the AFDWteam’s participation and support of this process.</p>	JMT	Noted. (JMT- lel)
Advisory Council on Historic Preservation (ACHP)	ACHP-01	11/29/2022	Section 106/Cultural Resources			<p>Based on our review of the material you provided, we see no indication that the project is a federal undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA). For Section 106 to apply there must be federal involvement in an activity that has the potential to affect historic properties. For example, Section 106 applies when a federal agency owns or manages property (land, a building, etc.) that could be affected by its own project or circumstances where a federal agency is providing funding, issuing a license or a permit, or providing other assistance to a project carried out by a nonfederal entity. The ACHP is available to provide technical assistance on the review process when Section 106 applies. You may find more information about the ACHP’s activities and role in Section 106 review in our publication ACitizen’s Guide to Section 106 Review, available on our website.If there is a federal hook to the development, planning, and construction of the VEC, it is the sponsoring federal agency who is responsible for complying with Section 106 of the NHPAand its implementing regulations, “Protection of Historic Properties” (36 CFR Part 800). Therefore, it is that federal agency who is responsible for all findings and determinations in the Section 106 process for this undertaking. Accordingly, that federal agency should determine the effect of the referenced project on historic properties and, if a finding of adverse effect is made, then in accordance with 36 CFR § 800.6(a)(1) notify the ACHP to determine if it will participate in consultation to seek ways to resolve adverse effects. While the Pentagon Memorial Fund (supported by Johnson, Mirmiran and Thompson) may have an active role in the Section 106 process if it applies, further correspondence to the ACHP on this project should be initiated by that federal agency and accompanied by appropriate documentation as specified in 36 CFR § 800.11(e).</p>	ANC	<p>In regards to the 9/11 Pentagon Memorial Visitor Education Center (VEC), Army National Military Cemeteries (ANMC) considers this a federal undertaking subject to review under Section 106 of the National Historic Preservation Act (NHPA). If approved, ANMC proposes to lease land to the Pentagon Memorial Fund (PMF) for the subsequent construction and operation of a VEC for the Pentagon Memorial on the grounds of Arlington National Cemetery in Arlington, Virginia. Construction and operation of the Pentagon Memorial VEC is privately funded and operated, with ANC providing the lease of an approximately 3.71-acre parcel of land for siting of the facility. Approval of the project and lease is partially contingent on completion of NEPA and Section 106 compliance. When the Section 106 process is initiated, ANMC will be the sponsoring federal agency responsible for complying with the NHPA and its implementing regulations. ANMC will initiate the Section 106 process with the DHR, with support from the project proponent, the Pentagon Memorial Fund (PMF). At this point in time, the PMF wishes to engage in a public scoping meeting, in preparation for initiation of the NEPA Process. In the near future, ANMC will, with support from the PMF, initiate the Section 106 process, which will involve additional consultations and public meetings.</p>

Agency	Comment ID	Response Date	Category 1	Category 2	Category 3	Comment	Responsibility	Response
Department of Conservation and Recreation Division of Natural Heritage	DCR-02	1/10/2023	Biological Resources			The Department of Conservation and Recreation's Division of Natural Heritage (DCR) has searched its Biotics Data System for occurrences of natural heritage resources from the area outlined on the submitted map. Natural heritage resources are defined as the habitat of rare, threatened, or endangered plant and animals species, unique or exemplary natural communities, and significant geologic formations. According to the information currently in Biotics, natural heritage resources have not been documented within the submitted project boundary including a 100 foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources. Under a Memorandum of Agreement established between the Virginia Department of Agriculture and Consumer Services (VDACS) and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species. The current activity will not affect any documented state-listed plants or insects. There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity. New and updated information is continually added to Biotics. Please re-submit a completed order form and project map for an update on this natural heritage information if the scope of the project changes and/or six months has passed before it is utilized. A fee of \$90.00 has been assessed for the service of providing this information. Please find attached an invoice for that amount. Please return one copy of the invoice along with your remittance made payable to the Treasurer of Virginia, DCR Finance, 600 East Main Street, 24th Floor, Richmond, VA 23219. Payment is due within thirty days of this invoice date. Please note late payment may result in the suspension of project review service for future projects. The Virginia Department of Wildlife Resources (VDWR) maintains a database of wildlife locations, including threatened and endangered species, trout streams, and anadromous fish waters that may contain information not documented in this letter. Their database may be accessed from http://vafwis.org/fwis/ or contact Amy Martin at (804-367-2211) or amy.martin@dwr.virginia.gov .	JMT	This information will be incorporated into section xx.xx of the Environmental Assessment. (JMT - lel)
Department of Historic Resources/State Historic Preservation Office	DHR-01	11/30/2022	NEPA Process	Section 106/Cultural Resources		The Department of Historic Resources (DHR), as the State Historic Preservation Office (SHPO), will participate in consultation on this undertaking pursuant to NEPA and Section 106 of the National Historic Preservation Act. Unfortunately, DHR will not be able to send a representative to the 12 December meeting at ANC. After the meeting please provide DHR with a hardcopy of the presentation for our edification and project records.	ANC	
Arlington County Water Sewer Streets	ACWSS-01	12/2/2022	Utilities			Arlington County Water Sewer Streets will participate in the NEPA process because our most critical wastewater sewer (54" Potomac Interceptor) runs along your site's S. Joyce St frontage.	Walter Phillips	Noted.
Virginia Department of Environmental Quality (DEQ)	DEQ-01	12/6/2022	NEPA Process			In order to ensure an effective coordinated review of the environmental documents, notification should be sent directly to OEIR. We request that you submit one electronic to eir@deq.virginia.gov (25 MB maximum) or make the documents available for download at a website, file transfer protocol (ftp) site or the VITALFT file share system (Requires an "invitation" for access. An invitation request should be sent to eir@deq.virginia.gov .) We request that the review of these documents be done concurrently, if possible. The environmental documents should include U.S. Geological Survey topographic maps as part of their information. We strongly encourage you to issue shape files with the NEPA document. In addition, project details should be adequately described for the benefit of the reviewers.	JMT	Noted. An electronic version of the Draft Environmental Assessment will be submitted to OEIR at eir@deq.virginia.gov . (JMT - lel)

Agency	Comment ID	Response Date	Category 1	Category 2	Category 3	Comment	Responsibility	Response
Virginia Department of Environmental Quality (DEQ)	DEQ-02	12/6/2022	NEPAProcess			As you may know, NEPA(PL91-190, 1969) and its implementing regulations (Title 40, Code of Federal Regulations, Parts 1500-1508) requires a draft and final Environmental Impact Statement (EIS) for federal activities or undertakings that are federally licensed or federally funded which will or may give rise to significant impacts upon the human environment. An EIS carries more stringent public participation requirements than an Environmental Assessment (EA) and provides more time and detail for comments and public decision-making. The possibility that an EIS may be required for the proposed project should not be overlooked in your planning for this project.	JMT	Noted. An Environmental Assessment is being prepared. Should the evaluation determine that impacts cannot be mitigated below the thresholds of significance, an Environmental Impact Assessment will be prepared. (JMT- 1e1)
Virginia Department of Environmental Quality (DEQ)	DEQ-03	12/6/2022	NEPAProcess			While this Office does not participate in scoping efforts beyond the advice given herein, other agencies are free to provide scoping comments concerning the preparation of the NEPA document. Accordingly, we are providing notice of your scoping request to several state agencies and those localities and Planning District Commissions, including but not limited to: Department of Environmental Quality: o DEQ Regional Office* o Air Division* o Office of Wetlands and Stream Protection* o Office of Local Government Programs* o Division of Land Protection and Revitalization o Office of Stormwater Management* Department of Conservation and Recreation Department of Health* Department of Agriculture and Consumer Services Department of Wildlife Resources* Virginia Marine Resources Commission* Department of Historic Resources Department of Mines, Minerals, and Energy Department of Forestry Department of Transportation Note: The agencies noted with a star (*) administer one or more of the enforceable policies of the Virginia CZM Program.	JMT	Noted. Information provided by those listed will be incorporated into appropriate sections of the Environmental Assessment. (JMT- 1e1)
Virginia Department of Environmental Quality (DEQ)	DEQ-04	12/6/2022	Water Resources			Pursuant to the federal Coastal Zone Management Act of 1972, as amended, and its implementing regulations in Title 15, Code of Federal Regulations, Part 930, federal activities, including permits, licenses, and federally funded projects, located in Virginia's Coastal Management Zone or those that can have reasonably foreseeable effects on Virginia's coastal uses or coastal resources must be conducted in a manner which is consistent, to the maximum extent practicable, with the Virginia CZM Program.	JMT	Noted. A Coastal Zone Consistency Determination for the proposed project will be sought from VDEQ. (JMT- 1e1)

Agency	Comment ID	Response Date	Category 1	Category 2	Category 3	Comment	Responsibility	Response
Virginia Department of Environmental Quality (DEQ)	DEQ-05	12/6/2022	Water Resources	Biological Resources	Hazardous and Toxic Materials and Waste	Below is a list of databases that may assist you in the preparation of a NEPA document: • DEQ Online Database: Virginia Environmental Geographic Information Systems Information on Permitted Solid Waste Management Facilities, Impaired Waters, Petroleum Releases, Registered Petroleum Facilities, Permitted Discharge (Virginia Pollution Discharge Elimination System Permits) Facilities, Resource Conservation and Recovery Act (RCRA) Sites, Water Monitoring Stations, National Wetlands Inventory: www.deq.virginia.gov/ConnectWithDEQ/VEGIS.aspx • DEQ Virginia Coastal Geospatial and Educational Mapping System (GEMS) Virginia's coastal resource data and maps; coastal laws and policies; facts on coastal resource values; and direct links to collaborating agencies responsible for current data: http://128.172.160.131/gems2/ • MARCO Mid-Atlantic Ocean Data Portal The Mid-Atlantic Ocean Data Portal is a publicly available online toolkit and resource center that consolidates available data and enables users to visualize and analyze ocean resources and human use information such as fishing grounds, recreational areas, shipping lanes, habitat areas, and energy sites, among others. http://portal.midatlanticocean.org/visualize/#x=-73.24&y=38.93&z=7&logo=true&controls=true&basemap=Ocean&tab=data&legends=false&layers=true • DHR Data Sharing System Survey records in the DHR inventory: www.dhr.virginia.gov/archives/data_sharing_sys.htm • DCR Natural Heritage Search Produces lists of resources that occur in specific counties, watersheds or physiographic regions: www.dcr.virginia.gov/natural_heritage/dbsearchtool.shtml • Wetland Condition Assessment Tool (WetCAT): https://www.deq.virginia.gov/water/wetlands-streams/wetcat • DWR Fish and Wildlife Information Service Information about Virginia's Wildlife resources: http://vafwis.org/fwis/4/ • Total Maximum Daily Loads Approved Reports: https://www.deq.virginia.gov/programs/water/waterquality/information/tmdls/tmdl/tmdldevelopment/approvedtmdlreports.aspx • Virginia Outdoors Foundation: Identify VOF-protected land: http://vof.maps.arcgis.com/home/index.html • Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) Database: Superfund Information Systems Information on hazardous waste sites, potentially hazardous waste sites and remedial activities across the nation, including sites that are on the National Priorities List (NPL) or being considered for the NPL: www.epa.gov/superfund/sites/cursites/index.htm • EPA RCRA Info Search Information on hazardous waste facilities: www.epa.gov/enviro/facts/rcrainfo/search.html • EPA Envirofacts Database EPA Environmental Information, including EPA-Regulated Facilities and Toxics Release Inventory Reports: www.epa.gov/enviro/index.html • EPA NEPA Assist Database Facilitates the environmental review process and project planning: http://nepassisttool.epa.gov/nepassist/entry.aspx	JMT	Noted. These databases will be referenced during preparation of the Environmental Assessment. (JMT - lel)

Agency	Comment ID	Response Date	Category 1	Category 2	Category 3	Comment	Responsibility	Response
VADEQ Water Planning Division, Office of Watersheds and Local Government Assistance Programs	DEQ-06	12/7/2022	Water Resources	Utilities	Geological and Soil Resources	In Arlington County, the areas protected by the Chesapeake Bay Preservation Act (CBPA), as locally implemented, require conformance with performance criteria. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by the local government. RPAs include tidal wetlands and tidal shores, non-tidal wetlands connected by surface flow and contiguous to tidal wetlands or waterbodies with perennial flow, a 100-foot buffer area located adjacent to and landward of the above components and along both sides of any water body with perennial flow. The RMA includes all areas within the County not designated as an RPA. Under the Federal Consistency Regulations of the Coastal Zone Management Act of 1972, actions initiated and undertaken by federal agencies in Virginia must be conducted in a manner “consistent to the maximum extent practicable” with the enforceable policies of the Virginia Coastal Zone Management Program. The Coastal Lands Management enforceable policy is administered through the Chesapeake Bay Preservation Act and Regulations. Federal actions on installations located within Tidewater Virginia are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated RPAs and RMAs, as provided in §9VAC25-830-130 and 140 of the Regulations, including compliance with the requirements of the Virginia Erosion and Sediment Control Handbook, and stormwater management criteria consistent with water quality protection provisions of the Virginia Stormwater Management Regulations (9VAC25-870-51 and 9VAC25-870-103.) For land disturbance over 2,500 square feet, the project must comply with the requirements of the Virginia Erosion and Sediment Control Handbook, Third Edition, 1992. While there are no RPA features or buffers located on the grounds of the Pentagon, including the project site, the applicant must adhere to all requirements related to land development on RMA lands. Construction within the RMA must be consistent with the general performance criteria provisions of §9VAC25-830-130 of the Regulations, which includes disturbing no more land than necessary to provide for the proposed use, minimizing impervious cover, and preserving indigenous vegetation to the maximum extent practicable consistent with the proposed use. Provided adherence to the above requirements, the proposed activity would be consistent with the Chesapeake Bay Preservation Act and the Regulations.	JMT/Walter Phillips	Noted. This information will be incorporated in Section XXXX of the Environmental Assessment. A Coastal Zone Consistency Determination for the proposed project will be sought from VDEQ. Disturbance will be minimized and the requirements noted here will be adhered to during design development. (JMT - mdc)
Virginia Outdoors Foundation	VOF-01	12/12/2022	Land Use			As of December 12, 2022, there are not any existing nor proposed VOF open-space easements immediately adjacent to the project. Please contact VOF again for further review if the project area changes or if this project does not begin within 24 months.	JMT	Noted. (JMT - lel)
National Capital Planning Commission	NCPC-01	12/16/2022	NEPA Process			We recommend scheduling a pre-submission briefing with NCPC staff as soon as possible to discuss the proposed project, identify potential issues, and establish coordination for the plan review stages and Commission review.	Tracerics	A pre-submission briefing has been scheduled for February 10, 2023. (Tracerics - as)
National Capital Planning Commission	NCPC-02	12/16/2022	Purpose/Need	Transportation/Traffic	Land Use	The scoping materials indicate that the proposed VEC will provide interactive exhibits and educational programs in addition to conference space and other support areas. The EA should include additional detail about the VEC program to better inform the expected visitor and user patterns. Such information should include the number of visitors anticipated and hours of operation; square footage needed for exhibit space; the size and purpose of the conference space; need for, and allocation of, parking spaces. The program will also inform other aspects of the site plan and building design such as transportation, parking, building massing, and viewsheds.	MGAC	Information to be coordinated and provided by all consultants as future appendix to EA (MGAC - KL)
National Capital Planning Commission	NCPC-03	12/16/2022	Transportation/Traffic	Visitor Use and Experience		The land proposed for siting of the VEC is bounded by Columbia Pike, South Joyce Street, and Washington Boulevard following reconfigurations of these roadways resulting from the Defense Access Roads Project. The site is physically detached from the Memorial and separated by Washington Boulevard. It is unclear how visitors will move between the Memorial and the VEC and if the VEC is accessible by foot or bicycle from the Pentagon Metro Station. Comprehensive Plan policies advocate for locating federal visitor attractions within walking distance of public transportation stops and ensuring the path between the attraction and the stop are ADA, pedestrian, and bicycle accessible. Therefore, the EA should evaluate pedestrian circulation between the VEC, the Memorial, and the Metro Station and its effect on the visitor experience. This evaluation should include pedestrian and bicycle routes; travel time and distances; and other anticipated modes of transportation between these destinations.	Gorove-Slade	Comment noted. A multimodal transportation assessment (MMTA) will be prepared, which will include bicycle and pedestrian routes, travelsheds, and multimodal trip generation. (GS)
National Capital Planning Commission	NCPC-04	12/16/2022	Alternatives			The EA should also discuss if alternative sites that were considered for the VEC and the reasons why they were dismissed from further consideration.	MGAC / PMF Counsel	Comment to be reviewed and a preliminary response to be provided by the PMF's legal counsel (MGAC - KL)

Agency	Comment ID	Response Date	Category 1	Category 2	Category 3	Comment	Responsibility	Response
National Capital Planning Commission	NCPC-05	12/16/2022	Section 106/Cultural Resources			The EA should consider impacts to historic and visual resources due to the proximity of the VEC site to the ANC and the U.S. Air Force Memorial. The scoping materials include four alternatives for the site configuration and building massing, which ranges from two to three stories in height. It is unclear if the VEC will be visible from the ANC north of Columbia Pike and from the U.S. Air Force Memorial, or if views to the ANC and U.S. Air Force Memorial are impacted from the south and east. Site sections from the north to the south and east to west would clarify the relationship of the VEC to these significant adjacent sites. Further, the selected alternative is encouraged to utilize the natural topography of the site to minimize the appearance of the building height and visibility to and from the ANC and the U.S. Air Force Memorial as much as possible.	Fentress/ Walter Phillips	Building sections and views from the ANC and AFM can be provided. The natural topography of the VEC site will be used to minimize the appearance of the building by berming the first floor into the grade by as much as 14 feet. (FASrw)
National Capital Planning Commission	NCPC-06	12/16/2022	Section 106/Cultural Resources			ANC should initiate consultation with the Virginia Department of Historic Resources pursuant to the National Historic Preservation Act to identify any potential adverse effects to historic resources.	ANC	
National Capital Planning Commission	NCPC-07	12/16/2022	Section 106/Cultural Resources			While the Pentagon is somewhat further away, the EA should also evaluate any potential visual impacts to the National Historic Landmark.	JMT/ANC	Noted. Visual impacts of the proposed project to the Pentagon will be included in the Visual Impacts Assessment. (JMT - lel)
National Capital Planning Commission	NCPC-08	12/16/2022	Transportation/Traffic	Purpose/Need	Air Quality/Greenhouse Gas	Comprehensive Plan policies recognize curbing the use of private automobiles as a means of travel for visitors as an important regional goal. The scoping materials indicate 136 parking spaces are proposed on the VEC site. It is unclear why 136 spaces are needed at the VEC and if other modes of transportation to the site are incorporated. The EA should consider traffic impacts on surrounding streets and the anticipated impact on carbon emissions from single occupancy vehicles traveling to and from the site. Overall, the project should seek to minimize the amount of parking proposed and prioritize alternative modes of transportation, such as walking, bicycling, and bus/shuttle services from the Pentagon Metro Station and other nearby visitor destinations.	MGAC / Gorove-Slade	Comment noted. A multimodal transportation assessment (MMTA) will be prepared, which will include multimodal trip generation estimates for the number of vehicular, bicycle, pedestrian, and transit trips generated by the VEC. (GS)
National Capital Planning Commission	NCPC-09	12/16/2022	Utilities	Air Quality/Greenhouse Gas		Policies encourage sustainable building and site development to reduce impacts to the natural environment. As such, the VEC should reduce potable water use, optimize building orientation for passive solar energy gain, and plan space for solar panels or other sources of on-site renewable energy generation. In addition, parking areas should be designed to support electric vehicle charging stations with consideration for electricity sourced from renewable resources. The project should also incorporate intensive and extensive green roofs on building rooftops that provide visual and occupiable amenity space for building users as well as environmental benefits including enhanced stormwater management, reduction in the urban heat island effect, and overall building cooling which reduces energy use. The VEC should minimize land disturbance and strive to meet stormwater management requirements through low impact development strategies (e.g.; bioswales, permeable paving, green roofs, cisterns, rain barrels, etc.) rather than use of manufactured treatment devices or detention/retention ponds, and seek to integrate stormwater management facilities with the facility's open space network. In summary, the EA should analyze changes to energy and water use, and stormwater runoff across site development alternatives. Further, the project will be required to comply with Virginia Department of Environmental Quality (VADEQ) and Arlington County stormwater regulations and should plan to meet federal requirements under Section 438 of the Energy Independence and Security Act.	Fentress / Walter Phillips	Consistent with the Sustainable Design and Development (SDD) Policy for the Department of the Army and the requirements of UFC 1-200-02 and UFC 2-100-01, the site and building design will comply with or exceed the standards set forth by USGBCs LEED Silver minimum in addition to VADEQ and Arlington County Stormwater Regulations. As such, the items noted within the comment will be addressed, including but not limited to: reduced potable water, passive and active solar strategies, electric vehicle charging stations, intensive or extensive green roofs, enhanced stormwater management, urban heat island effect, bioswales, rain containment, and energy use. (FASrw)
National Capital Planning Commission	NCPC-10	12/16/2022	NEPA Process			NCPC recognizes the significance of federal government coordination with local jurisdictions throughout the region to address areas of mutual interest and prepare strategies for the region's urban design and environmental quality. NCPC encourages the project proponent and the ANC to engage with local planning officials, including Arlington County and the Virginia Department of Transportation, to understand how the VEC project may impact and/or support jurisdictional planning and transportation initiatives. ANC should also work with local partners to understand and address any potential community concerns.	Traceris / JMT	Coordination with both Arlington County and VDOT is being planned. A multimodal transportation assessment (MMTA) will be prepared, which will include multimodal trip generation estimates for the number of vehicular, bicycle, pedestrian, and transit trips generated by the VEC. Potential community concerns will be coordinated with the consulting parties and public via the Section 106 process and Draft EA review, respectively. Additionally, CFA, and DHR have been informally engaged. Both agencies will attend a joint meeting with NCPC scheduled for February 10, 2023. (JMT - mdc, Traceris - as)

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Advisory Council on Historic Preservation (ACHP)	ACHP-02	12/21/2022	Section 106/Cultural Resources			I am the Army Liaison and will be the ACHP point of contact for the Pentagon Memorial Visitor Center project. Please keep me in the loop once ANMC gets ready to initiate 106. All my contact info is below. A Megan BorthwickArmy LiaisonAdvisory Council on Historic Preservation 401 F Street NW, Suite 308, Washington, DC 20001 Phone 202.517.0221 Email: mborthwick@achp.gov	ANC	
Arlington County DES TPCPM	DES-01	1/12/2023	Transportation/Traffic			DES Staff requests a meeting to discuss the assumed transportation analysis inputs, including trip generation and mode split for the site.	MGAC / Gorove-Slade	Comment noted. The project team will reach out to DES to schedule an MMIA scoping meeting. (GS)
Arlington County DES TPCPM/TE&O	DES-02	1/12/2023	Transportation/Traffic			Identify how pedestrians, cyclists/scooters, and transit (bus and rail) riders will access the site. DES can assist consultant with projecting multimodal trips using latest reference materials (ITE Trip Gen. 11th Edition) and its recommendations.	MGAC / Gorove-Slade	Comment noted. The MMIA will include a multimodal trip generation and will indicate bicycle, pedestrian, and transit access to the site. (GS)
Arlington County DES TPCPM	DES-03	1/12/2023	Transportation/Traffic			Include a robust plan on how to manage school/tour/charter bus circulation. Identify where bus parking will occur (on and off site).	MGAC / Gorove-Slade	Detailed plans on the management of bus circulation on parking will be fleshed out after environmental documentation; a preliminary framework for bus circulation and parking management will be provided. (GS)
Arlington County DES TPCPM	DES-04	1/12/2023	Transportation/Traffic			Articulate if there will be a transportation management plan and an associated project manager. Specify if there will be a staff member (i.e., lot attendant/dispatcher) dedicated to managing bus arrivals, staging, and departures from the site.	MGAC / Gorove-Slade	Comment noted. The potential inclusion of a preliminary TMP framework as part of the MMIA will be discussed as part of scoping discussions with DES. (GS)
Arlington County DES TPCPM	DES-05	1/12/2023	Transportation/Traffic			Identify where bike parking will be accommodated on the site.	MGAC / Gorove-Slade	Comment noted. Bike parking is included in the site design; the MMIA will provide information on the amount and type of bike parking provided. (GS)
Arlington County DES TPCPM	DES-06	1/12/2023	Transportation/Traffic			Include clear and direct pedestrian connections to the building entrance from Joyce Street and Columbia Pike.	MGAC / Gorove-Slade	Comment noted. The MMIA will indicate pedestrian access to the site. (GS)
Arlington County DES TPCPM	DES-07	1/12/2023	Transportation/Traffic			Identify clear and direct bicycle connections to on-site bike parking from the new cycle track being constructed on the north side of Columbia Pike at Joyce St intersection.	MGAC / Gorove-Slade	Comment noted. The MMIA will indicate bicycle access to the site. (GS)
Arlington County DES TPCPM	DES-08	1/12/2023	Transportation/Traffic			Identify the proximate transit (bus stops).	MGAC / Gorove-Slade	Comment noted. The MMIA will indicate nearby transit facilities. (GS)
Arlington County DES TE&O	DES-09	1/12/2023	Transportation/Traffic			Consistent with General Assembly approved legislation (Chapter 527 of the 2006 Acts of Assembly) Arlington County requires all development projects to comply with the Code of Virginia, Chapter 155 Traffic Impact Analysis Regulations 24 VAC 30-155 requirements. Prior to setting up a TIA scoping meeting with Arlington County Staff, developers must submit a VDOT “Pre-scope of Work Meeting Form” to the Department of Environmental Services (DES) for review at the scoping meeting. https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.vdot.virginia.gov%2Fprojects%2Fresources%2FPre-Scope_Form_7.08.doc&wdOrigin=BROWSELINK	MGAC / Gorove-Slade	The project team will prepare an MMIA scoping form and schedule a scoping meeting with DES to discuss. A trip generation analysis will be prepared to determine if a VDOT study is required. (GS)

Agency	Comment ID	Response Date	Category 1	Category 2	Category 3	Comment	Responsibility	Response
Arlington County DES TE&O	DES-10	1/12/2023	Purpose/Need			Collect existing program data (visitors and staff) for baseline assumptions.	MGAC?	Existing data on Pentagon Memorial visitorship can be provided; however, it is noted that because the VEC is a new and different type of facility, a separate market study will be used to inform trip generation estimates. (GS)
Arlington County DES TPCPM	DES-11	1/12/2023	Transportation/Traffic			The renderings do not appear to correctly depict the proposed bike-ped improvements along Columbia Pike. Ensure that design development of this proposal is coordinated.	MGAC / Gorove-Slade	Comment noted. Plans will incorporate latest project plans for Columbia Pike. (GS)
Arlington County DES TPCPM	DES-12	1/12/2023	Transportation/Traffic			Ensure that any transit service/bus stop assumptions incorporate the latest County and federal project plans for Columbia Pike.	MGAC / Gorove-Slade	Comment noted. Plans will incorporate latest project plans for Columbia Pike. (GS)
National Park Service	NPS-01	12/22/2022	Section 106/Cultural Resources			As long as the NPS has no federal actions associated with this project, we would expect our role to be limited. We would also like to remain on your mailing list and included as a consulting party under the 106 coordination.	ANC	
Air Force District of Washington	AFDW-02	12/28/2022	Section 106/Cultural Resources	Visitor Use and Experience		Concept 2,4 Height of the protruding bulkhead is a concern for the viewshed from the AF Memorial to the Pentagon. If the materials are reflective in nature, concern over sun angles blinding visitors at the AF Memorial looking to the DS skyline is also a concern.	Fentress	Agreed and acknowledged. (FA-srw)
Air Force District of Washington	AFDW-03	12/28/2022	Transportation/Traffic			All Concepts Consider evaluating traffic flow on Columbia Pike and Joyce Street to determine how the addition of the new facility might impact traffic flow. Bus drop off for 3 buses does not seem adequate for Honor Flight, Tour Guild or school field trip bus counts. Excessive bus and private car traffic may impede traffic on Columbia Pike and the Joyce Street entrance to the ANC Operational Center. It is our experience that Honor Flights can have up to 6 buses at one time. Our main concern is access impeded due to congestion on or around the ANC Operational Center entrance, the only access point for the future and only parking for AFM. Please verify the traffic flow and management of bus traffic and assure access to the AF Memorial parking via the Joyce Street entrance to the ANC Operations Center.	Gorove-Slade	Comment noted. A multimodal transportation assessment (MMTA) will be prepared, which will include an assessment of vehicular capacity impacts to nearby intersections. (GS)
Air Force District of Washington	AFDW-04	12/28/2022	Transportation/Traffic			All Concepts Regarding commercial bus traffic, AFDW appreciates your consideration of COAs that provide a way of handling bus traffic on site. We highly recommend you include this capability because Air Force efforts to include a “bus lane” off of Columbia Pike at the AF Memorial were not supported by Arlington County in their review of the Defense Access Road project. Additionally, given access concerns from the local “Tour Bus Guild,” we recommend you reach out to that organization proactively to solicit their feedback on a bus-related solution that would enable bus traffic to visit the VEC.	Gorove-Slade	Comment noted. (GS)
Air Force District of Washington	AFDW-05	12/28/2022	Transportation/Traffic	Purpose/Need		All Concepts Regarding your VEC dedicated parking area, we appreciate your plan to provide up to 136 parking spaces for visitors to the VEC. However, we want to emphasize that neither ANC nor the Air Force included any parking requirement for the VEC in the development of Visitor Parking adjacent to the new Pedestrian Access Point to ANC near the AF Memorial. That parking structure is not expected to have any capacity to support the VEC.	MGAC / Gorove-Slade	Comment noted. (GS)
Air Force District of Washington	AFDW-06	12/28/2022	Air Quality/Greenhouse Gas	Visitor Use and Experience	Section 106/Cultural Resources	All Concepts. Consider uncontrolled café food preparation aroma control. It may detract from the visitor experience at the AF Memorial/ANC Columbarium. Sight, sound, and smell can be impacted at the AF Memorial given the right wind/atmospheric conditions. Please consider the control of aroma as well as viewshed concerns.	MGAC / Fentress / JMT	Agreed and acknowledged. Food service will be provided via pre-prepared catering and warming areas, not a full service kitchen, and will therefore not have issues associated with a full service kitchen and the commensurate odors. (FA-srw)
Air Force District of Washington	AFDW-07	12/28/2022	Noise	Visitor Use and Experience		All Concepts. While the concept designs do not provide specific details, please consider sound concerns travelling to the surrounding environments. These would include backup safety beeping sounds from waste disposal trucks. Note: The design of the AF Memorial was oriented on the DC skyline and is a key contemplation feature of the Memorial. If commercial or transportation sounds are heard on a routine basis, it would interfere with the contemplative atmosphere of the AF Memorial.	MGAC	Design team consultants to follow all applicable codes and ordinances for noise levels, mitigation, pollution, etc. Such codes and ordinances will be included on future drawings and mentioned in the forthcoming EA (MGAC - KL)

Agency	Comment ID	Response Date	Category 1	Category 2	Category 3	Comment	Responsibility	Response
Air Force District of Washington	AFDW-08	12/28/2022	Purpose/Need	Visitor Use and Experience	Transportation/Traffic	All Concepts. The stated purpose of the Visitor Education Center (VEC) is to “...support visitors of the Pentagon Memorial.” You may wish to consider the opportunity to connect to visitors of the Arlington National Cemetery (ANC) Southern Expansion and the AF Memorial by adding appropriate design of crosswalks to the north side of Columbia Pike. Plans to enhance the pedestrian pathway along the realigned Columbia Pike offer you the opportunity to connect to pedestrian traffic to/from the new Pedestrian Access Point to ANC at the AF Memorial...in addition to the connection to the Pentagon.	MGAC / ANC	Connecting visitors of the ANC Southern Expansion and AF Memorial is not a component of the Purpose and Need for the VEC as the primary purpose and need is to support visitors to the Pentagon 9/11 Memorial. Connecting visitors of the ANC Southern Expansion and AF Memorial could be considered through further consultation with ANC and USACE as an ancillary goal or mitigation measure (if applicable) for the VEC.
Air Force District of Washington	AFDW-09	12/28/2022	Transportation/Traffic			All Concepts. Recommend including illustrations of your solution to deliberately establish pedestrian access between the 9/11 Memorial and the new VEC.	MGAC / Gorove-Slade	Gorove-Slade to provide adequate drawing/illustration to address this comment (MGAC - KL)
Air Force District of Washington	AFDW-10	12/28/2022	Visitor Use and Experience			All Concepts. Consider a project to place a remembrance of the AA77 flight path along the sidewalk along Columbia Pike where the aircraft flew over. This may be a way to connect the Pentagon, Pentagon Memorial, VEC, and the AF Memorial. Coordination with Arlington County and current ANC construction may be required. This could be a community participation (in design and materials) for how to mark this on the sidewalk.	MGAC / ANC	The PMF will explore this recommendation further as the project design progresses (MGAC - KL)
Air Force District of Washington	AFDW-11	12/28/2022	Purpose/Need			All Concepts. If possible, could you be more specific in the estimations of VEC visitor counts and the probability of visitors walking to the AF Memorial. This would be helpful in determining the impact on the AF Memorial operations and maintenance and development of any other comments for the NEPA.	MGAC	Information regarding VEC visitor counts to be coordinated and provided by consultant(s) as future appendix to EA. Analysis will be specific to VEC visitors. Analysis of VEC visitors to the AF Memorial will be qualitatively addressed in the Indirect/Cumulative Effects section of the EA. (MGAC - KL/JMT- MC)
Air Force District of Washington	AFDW-12	12/28/2022	Land Use			All Concepts. Consider design more flowing with the environment. Suggest any facing architecture to the AF Memorial complement the curvature of the spires in some form especially if the spires are a key feature in the VEC viewshed to the west by northwest.	Fentress	Acknowledged. The design of the new VEC will be complementary with all the surrounding buildings and environment and will take into account the monumental and significant architectural expression associated with the AFM (FA-srw)
Department of Conservation and Recreation Division of Natural Heritage	DCR-01	12/12/2022	NEPA Process			In order to receive our comments, we request that you fill out our Information Services Order Form. A link to the form can be found here. Please let me know if you have any questions.	JMT	The Information Services Order Form was completed by JMT on 12/13/2022. (JMT- vb)
Virginia Department of Health - Office of Drinking Water	VDH-01	1/4/2023	Utilities			Below are our comments as they relate to proximity to public drinking water sources (groundwater wells, springs and surface water intakes). Potential impacts to public water distribution systems or sanitary sewage collection systems must be verified by the local utility. There are no public groundwater wells within a 1-mile radius of the project site. There are no surface water intakes located within a 5-mile radius of the project site. The project is not within the watershed of any public surface water intakes. There are no apparent impacts to public drinking water sources due to this project. The Virginia Department of Health – Office of Drinking Water appreciates the opportunity to provide comments. If you have any questions, please let me know.	Fentress / Walter Phillips	Noted. This project will work with Arlington County on water service and sanitary sewage. (WP - kw)
Washington Headquarter Service	WHS1	1/20/2023	Transportation/Traffic			The 9/11 Visitor Center EA should analyze the pedestrian traffic flow between the 9/11 Visitor's Center and the Pentagon 9/11 Memorial from implementing the Proposed Action.	Gorove-Slade	Comment noted. A multimodal transportation assessment (MMTA) will be prepared, which will include information on pedestrian activity to and from the site. (GS)

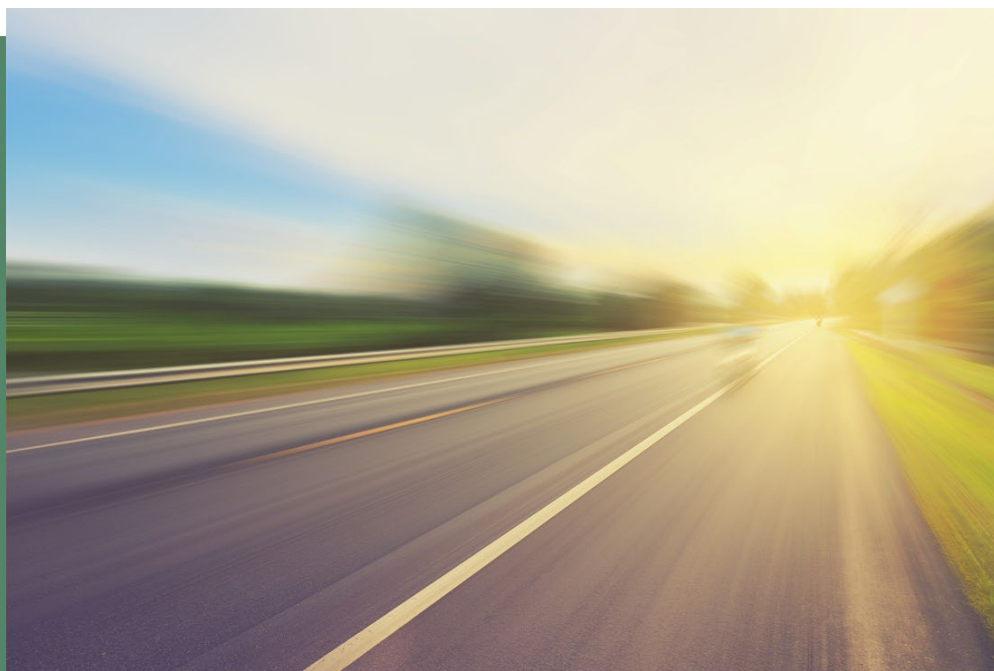
Appendix B

Air Quality Technical Report

9/11 Pentagon Memorial – Proposed Visitor Education Center
Arlington National Cemetery, Arlington, Virginia

Air Quality Technical Report

October 17, 2023



Prepared for:

Johnson, Mirmiran, and Thompson, Inc.
40 Wight Avenue
Hunt Valley, MD 21030
and
Pentagon Memorial Fund
1 N. Rotary Road
Arlington, VA 22202

Prepared by:



Straughan Environmental, Inc. | 10245 Old Columbia Road | Columbia, MD 21046
phone 301.362.9200 | www.straughanenvironmental.com | fax 301.362.9245

Revision History Table

Version	Date	Notes
1	8/9/23	Draft
2	10/17/23	Revised Draft

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Figure 1. Study Area

Appendix

Appendix A. Emissions Calculations A-1

List of Acronyms

Acronym	Definition
CAA	Clean Air Act
CFR	Code of Federal Regulation
CH ₄	Methane
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
EPA	Environmental Protection Agency
GHG	Greenhouse Gas
GWP	Global Warming Potential
MOVES	Motor Vehicle Emissions Simulator
NAAQS	National Ambient Air Quality Standards
NO _x	Nitrous Oxides
O ₃	Ozone
Pb	Lead
PM	Particulate Matter
PM _{2.5}	Particulate Matter 2.5 micrometers
SIP	State Implementation Plan
SO ₂	Sulfur Dioxide
TPY	Tons Per Year
US	United States
VEC	Visitor Education Center
VOC	Volatile Organic Compounds

1. Background

The Pentagon Memorial Fund proposes the construction and operation of a 9/11 Pentagon Memorial Visitor Education Center (VEC) southwest of the existing 9/11 Pentagon Memorial on Washington Boulevard (Virginia Route 27) in Arlington, Virginia within the boundaries of Arlington National Cemetery's Southern Expansion Area. The VEC would bring up to 900,000 visitors per year. Straughan Environmental, Inc. has conducted a general conformity applicability analysis for the proposed 9/11 Pentagon Memorial VEC in accordance with the Clean Air Act.

2. Purpose and Objectives

As part of the 9/11 Pentagon Memorial VEC Project, Straughan Environmental, Inc. was retained to perform an air quality analysis. The objective of this task is to evaluate the VEC to determine the applicability of the requirements of the general conformity rule (Section 176 (c) (1) of the Clean Air Act (CAA)), National Ambient Air Quality Standards (NAAQS) attainment status, and prepare a report, as required, detailing the results of the general conformity evaluation. The analysis seeks to compare the projections of exhaust emissions of criteria pollutants resulting from the construction and operation of the VEC. These include particulate matter (2.5 micrometers in diameter or smaller (PM_{2.5})), carbon monoxide (CO), sulfur dioxide (SO₂), and oxides of nitrogen (NO_x). The analysis also considers greenhouse gases (GHG) emissions from carbon dioxide (CO₂).

The general conformity provision of Section 176(c) of the CAA prohibits federal agencies from taking actions which do not conform to the State Implementation Plan (SIP) for the attainment and maintenance of the NAAQS. The project is located in an area subject to conformity requirements and therefore must be included in a currently conforming transportation plan and program before being implemented per 40 CFR 93.114 and 40 CFR 93.115.

The study area for the project is shown in Figure 1.

3. Attainment Status

Areas where concentrations of criteria pollutants are below the NAAQS are designated by the Environmental Protection Agency (EPA) as being in "attainment" and areas where a criteria pollutant level exceeds the NAAQS are designated as being in marginal "nonattainment." Ozone (O₃) nonattainment areas are categorized based on the severity of nonattainment: marginal, moderate, serious, severe, or extreme. Carbon Monoxide (CO) and Particulate Matter (PM₁₀) nonattainment areas are categorized as moderate or serious.

EPA designates the Arlington County, Washington, DC-MD-VA area, which includes the new 9/11 Pentagon Memorial VEC, as a moderate nonattainment area for O₃ under the 2015 8-hour standard. The Arlington County area is designated as in attainment of the NAAQS for all other criteria pollutants.

4. General Conformity Applicability

Title 1, Section 176 (c) (1) of the CAA defines conformity as the upholding of “an implementation plan’s purpose of eliminating or reducing the severity and number of violations of the NAAQS and achieving attainment of such standards.” Conforming activities or actions should not, through additional air pollutant emissions:

- Cause or contribute to new violations of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS; or
- Delay timely attainment of any NAAQS or interim emission reductions.

Projects with annual total emissions from direct and indirect emissions less than the *de minimis* thresholds are not considered to be significant and do not require a general conformity determination. The proposed area reviewed for this study evaluated emissions resulting from construction and forecast transportation modes emissions resulting from operation of the 9/11 Pentagon Memorial VEC.

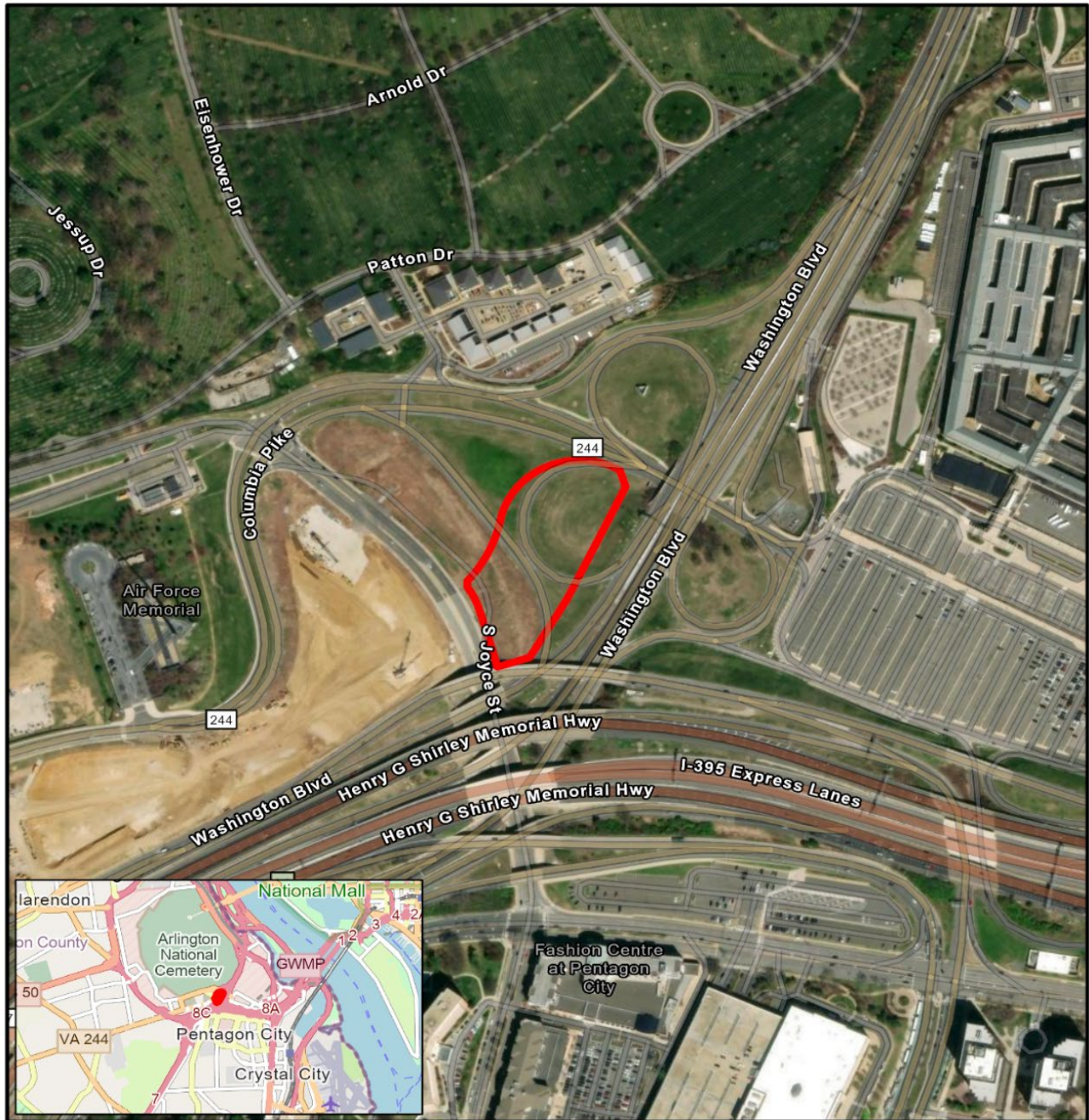


Figure 1. Study Area

5. Assessment of Project Emissions and De Minimis Emission Rates

40 CFR 93.153(b) details conformity determinations for federal actions in attainment and nonattainment areas. The following rate thresholds apply to the VEC for each pollutant:

40 CFR 93.153(b)(1) - For purposes of paragraph (b) of this section the following rates apply in nonattainment areas (NAA's):	
	Tons/year
Ozone (VOC's or NOx):	
Serious NAA's	50
Severe NAA's	25
Extreme NAAs	10
Other ozone NAA's outside an ozone transport region:	100
Other ozone NAA's inside an ozone transport region:	
VOC	50
NOx	100
Carbon Monoxide: All maintenance areas	100
SO ₂ or NO ₂ : All NAA's	100
PM ₁₀ :	
Moderate NAA's	100
Serious NAA's	70
PM _{2.5} (direct emissions, SO ₂ , NOx, VOC, and Ammonia):	
Moderate NAA's	100
Serious NAA's	70
Pb: All NAA's	25

Table 1. EPA Nonattainment Limits for Criteria Pollutants (Source: 40 CFR 93.153 (b)).

40 CFR 93.153(b)(2) - For purposes of paragraph (b) of this section the following rates apply in maintenance areas:	
	Tons/year
Ozone (NOx), SO ₂ or NO ₂ :	
All maintenance areas	100
Ozone (VOC's)	
Maintenance areas inside an ozone transport region	50
Maintenance areas outside an ozone transport region	100
Carbon monoxide: All maintenance areas	100
PM ₁₀ : All maintenance areas	100
PM _{2.5} (direct emissions, SO ₂ , NOx, VOC, and Ammonia)	100
All maintenance areas	100
Pb: All maintenance areas	25

Table 2. EPA Maintenance Area Limits for Criteria Pollutants (Source: 40 CFR 93.153 (b)).

An analysis of all direct and indirect emissions associated with the proposed VEC operation was completed and compared to *de minimis* thresholds to determine if general conformity is applicable to the proposed action. The proposed project area is in the Arlington County, Washington, DC-MD-VA region, which is in

marginal “nonattainment” for O₃. The primary precursors to O₃ development are NO_x and Volatile Organic Compounds (VOC). As a result, the NO_x and PM_{2.5} NAAQS limits are 100 tons/year, respectively, as shown in Table 1.

6. Methodology

6.1 Construction Emission Calculations

The PMF anticipates the proposed VEC to be under construction for approximately two years, from November 2024 through October 2026. Straughan separated construction emissions into three categories:

- Emissions associated with onsite equipment operations during construction;
- Emissions associated with dump trucks used to haul soil and other construction materials to and from the construction site; and
- Emissions associated with construction workers commuting to and from the construction site.

Straughan used different methodologies to calculate emissions associated with each category. The following sections provide a detailed explanation of the methodology used for each category of construction emissions.

6.1.1. Construction Equipment Emissions

The anticipated emissions calculated for construction equipment during Years 1 and 2 can be found in Table 3 (see Appendix A-2 for detailed emissions calculations). Straughan based calculations on the quantity and type of construction equipment used, the hours per day and number of days per year that equipment would be operated, and an assumed load factor of 0.6. The emission factors were obtained for NO_x, CO, VOC, SO₂, and CO₂ using EPA MOVES emission factors associated with specific classes of equipment. The construction emissions conservatively assumed that all equipment would be operating simultaneously. The construction activities schedule spans two years (24 months). Therefore, after calculating the final value for tons per year of each pollutant, it was divided equally over two years of projected construction. The general emissions for all construction equipment were calculated using the following equation:

$$\text{Emissions per year (metric tons)} = \text{emission factor (g/hr)} * \text{total hours of operation (hr/year)} * \text{units} \\ \text{conversion factors (tons/g)}$$

6.1.2. Construction Hauling Emissions

The anticipated emissions calculated for construction hauling can be found in Table 3 (see Appendix A-2 for detailed emissions calculations). The calculations were based on the amount of construction materials that will need to be hauled from the site, a reasonable distance to a dump site, the capacity of the hauling trucks, and the hauling trucks’ emission factors. Davis Construction, the construction contractor, estimates that 13,000 cubic yards of soil and construction materials need to be hauled off site for the project. The capacity of a standard dump truck is 14 tons (approximately 10 cubic yards). During the preliminary research phase, Straughan found that a typical distance to a hauling site relative to the project site was 25 miles away. Based on the information above, Straughan concluded that approximately 1,300 truck trips are required to fit the hauling needs of this project. Similar to the construction equipment emissions, the final value calculated for tons per year of each pollutant was divided equally over two years of projected construction. The general emissions for all hauling were calculated using the following equation:

$$\text{Emissions per year (metric tons)} = \text{trip mileage (miles/trip)} * \text{number of trips (trip)} * \text{Diesel Truck emission factor (g/mile)} * \text{units conversion factors (tons/g)}$$

6.1.3. Construction Commuter Emissions

The anticipated emissions from construction workers that commute in private vehicles can be found in Table 3 (see Appendix A-2 for detailed emissions calculations). The calculations were based on the number of manhours required to complete construction, the average distance commuters travel to the project site, and the vehicle type emission factors. Davis Construction provided an estimate of 211,200 manhours. It is to be assumed that commuters use a single passenger vehicle to travel to and from the site every 8 manhours, making two trips a workday. Data from the Metropolitan Washington Council of Governments State of the Commute Survey Report (2022) suggests that in 2022, commuters on average traveled 16.9 miles one way, a minor decrease in distance since the pandemic (an average one-way commute was 17.1 miles in 2019). The commuter emissions totals were distributed over each of the two years of this project with an estimated 45% of the commuter emissions during the first year and 55% during the second year under the assumption that more workers would be employed on the project during the second year. The general emissions for all commuters were calculated using the following equation:

$$\text{Emissions per year (metric tons)} = \text{commute (miles/day)} * \text{project man-days (days/year)} * \text{passenger vehicle emission factor (g/mile)} * \text{units conversion factors (tons/g)}$$

6.2 Operation Emissions Calculations

PMF anticipates that the VEC will increase the number of tourists and school groups visiting the 9/11 Pentagon Memorial year-round. As part of the general conformity analysis, Straughan estimated the annual criteria pollutant and greenhouse gas (GHG) emissions associated with vehicular traffic bringing visitors to the VEC. The anticipated emissions calculated for operations of the VEC per year can be found in Table 4 (see Appendix A-3 for detailed emissions calculations). These calculations are based on data projected in the *Visitor Education Center Attendance Potential Study* (2023) and *The Pentagon Memorial Visitor Education Center Multimodal Transportation Assessment* (2023). The Attendance Potential Study provided an estimate of number of visitors by type (school groups versus adult groups) distance visitors travel from, and the type of vehicle visitors would take to reach the VEC. It also provided the number of days per year that the VEC would be open to the public (359 days per year). The Transportation Assessment provided information on vehicle mode and number of trips.

Other than transit, VEC visitors would arrive via passenger cars and tour buses. Straughan focused the assessment of mobile source emissions on passenger cars and tour buses because emissions associated with transit vehicles (Washington Metro Area Transit Authority or Arlington Transit buses and trains, for example) are accounted for in transit agency emissions budgets. Electric and hybrid vehicles were not included in this report because less than 1% of registered vehicles in Virginia were electric in 2022 (DOE 2022). Emissions generated from electric or hybrid vehicles are negligible compared to gasoline and diesel engine vehicles. Table VI-3 from the Attendance Potential Study provided the totals of residential visitors from three different mile radius rings: 0-10 miles, 10-30 miles, and 30-50 miles. To be conservative, Straughan used the larger mileage of the ranges given as well as the highest attendance estimate to calculate the number of visitors expected each year. Straughan also used the high range attendance estimate of school groups from Table VI-3 that will be considered in the tour bus vehicle type. For visitors coming from more

than 50 miles away, Table VI-1 from the Attendance Potential Study was used. It was assumed that no passenger vehicles drove more than 50 miles solely to visit the VEC. Values found in Table VI-1 provided values for the number of school group tours and adult group tours visiting in a year which were all classified as a tour bus vehicle type. Straughan assumed that these group tours traveled an average of 100 miles from the project site and again used the high range attendance estimate from Table VI-1.

In addition to calculating totals for the number of visitors by type of vehicles and the distance they are estimated to travel, Straughan calculated vehicle emissions associated with Event and Facility Rental Attendees and employees who will be commuting to the new VEC. Table 6 from the Multimodal Transportation Assessment provides an estimate for the daily trips of the Event and Facility Rental Attendees and Employees. When multiplied by 359 (number of operating days in the year), the total number of trips to the VEC in a year could be calculated. Using the mode splits by visitor type in Table 7 and the vehicle occupancy estimate for each visitor type from Table 8 in the Multimodal Transportation Assessment, Straughan was able to calculate the total amount of vehicles of each type anticipated to travel to the VEC in a year. It was assumed that employees would travel an average of 30 miles to work. As for the people who attend events or rent out facilities, Straughan calculated mileage using the distribution of mile rings for the Residential market from Table VI-3 of the Attendance Potential Study. The general emissions for all commuters were calculated using the following equation:

$$\text{Emissions per year (metric tons)} = \text{number of vehicles} * \text{radius ring (miles/vehicle)} * \text{passenger vehicle emission factor (g/mile)} * \text{units conversion factors (tons/g)}$$

7. Emission Calculations

Emission calculations and supporting data from the *Multimodal Transportation Assessment* (Gorove Slade July 2023) and the *Attendance Potential Study* (ConsultEcon, Inc. March 2023) are included in Appendix A of this report and summarized in Tables 3 through 5.

Construction Activities Emissions (TPY)

	Year 1	Year 2
NO_x	0.1820696	0.1884336
CO	1.902212	2.291329
SO₂	0.002176	0.002176
CO₂	376.26805	416.00603

Table 3. Construction Phase Emissions (TPY)

Mobile Emissions (TPY Average)

Emission Type	Average Level
NO _x	2.4599349
CO	60.361635
SO ₂	0.00663915
PM _{2.5}	0.0379077
CO ₂	6726.846551

Table 4. Operations Emissions of VEC.

Summary of Emissions for Project

Emissions Type	SO ₂ Total (TPY)	CO Total (TPY)	NO _x Total (TPY)	PM Total (TPY)	CO ₂ Total (TPY)
Construction Equipment Emissions	3.97E-03	0.16	0.01	1.52E-04	257
Construction Commuter Emissions*	-	3.89	0.06	-	397
Construction Hauling Emissions	3.80E-04	0.14	0.30	0.01	138
Operations Emissions	0.007	60.36	2.46	0.038	6727
Total Emissions for Criteria Pollutants	0.01	64.56	2.83	0.05	7,519

Assumptions

* No emissions from SO ₂ and PM for gasoline vehicles, emissions apply only to diesel engines
5% of passenger vehicles contain diesel engines
VEC will be open 359 days per year
Most staff commute avg. 30 miles one-way to work

Table 5. Total Project Emissions (TPY)

8. Comparison

8.1 De Minimis Emission Rates

The *de minimis* emissions threshold for NO_x, CO, SO₂, and PM_{2.5} are 100 tons per year (TPY). If a project exceeds these thresholds, a general conformity determination is required to be completed for the project. Neither construction nor operations emissions are anticipated to exceed *de minimis* thresholds and therefore the project is exempt from a general conformity determination and further air quality review.

8.2 GHG Evaluation

The GHG emissions from the project are a result of the combustion of diesel fuel that produces emissions of CO₂ (carbon dioxide), CH₄ (methane), and N₂O (nitrous oxide). GHGs (CO₂, CH₄ and N₂O) are usually

presented as CO₂ equivalent or “CO₂e”, which is based on the specific Global Warming Potential (GWP). Heavy duty vehicles (trucks) contribute significantly to global air pollution and are the largest mobile source of NO_x, and the second largest source of GHG emissions in the transportation sector. The analysis focused on CO₂ emissions. The annual CO₂ emissions associated with the construction activities range from 376 to 416 TPY. The CO₂ emissions associated with operations would be around 6,726 TPY. There is not a threshold emission limit for GHG reporting for mobile sources, only stationary sources, at this time. There are national emission standards for mobile sources such as cars and light-duty trucks. The CO₂ emissions for all vehicles were calculated using the following equation:

$$CO_2 \text{ (metric tons)} = \text{fuel type } CO_2 \text{ emission rate (g/gal)} * \text{miles} / \text{vehicle fuel consumption (miles/gal)}$$

9. Conclusion

Because the emissions do not exceed any of the threshold limits for the criteria pollutants for the proposed area, no mitigation measures are required for the project. Based on the project scope and operations, the emissions associated with the construction and vehicle operations (commuter cars and buses) for visitation to the new 9/11 Pentagon Memorial VEC would not be a significant source of air pollution within the Washington metropolitan area.

10. References

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Appendix A - Emissions Calculations

A-1. Supporting Data

Table A-1a. Mode Split Data (Source: MMTA Report, *Table 7: Mode Splits Proposed for MMTA by Visitor Type*)

Visitor Type	Mode				
	Auto	Transit	Bike	Walk	Other (Private Bus/Shuttle)
Visitor Center Attendees - Tour Groups	0%	0%	0%	0%	100%
Non-Group Visitor Center Attendees (Residents)	60%	25%	0%	0%	15%
Non-Group Visitor Center Attendees (Tourists)	65%	30%	1%	4%	0%
Event and Facility Rental Attendees (Daytime Events)	65%	30%	1%	4%	0%
Event and Facility Rental Attendees (Nighttime Events)	65%	30%	1%	4%	0%
Staff/Employees	30%	61%	3%	6%	0%

Table A-1b. Vehicular Occupancy by Visitor Type (Source: MMTA Report, *Table 8: Vehicular Occupancy by Vehicle Type*)

	Visitor Center Attendees - Tour Groups	Non-Group Visitor Center Attendees		Event and Facility Rental Attendees		Staff/Employees
		Residents	Tourists	Daytime	Nighttime	
Vehicular Occupancy (people per vehicle)	48 ppl/veh ¹	30 ppl/veh ¹ (School Groups) 2.10 ppl/veh ² (Other Resident Visitors)	2.10 ppl/veh ²	1.18 ppl/veh ²	1.18 ppl/veh ²	1.18 ppl/veh ²

Sources:

1. Based on Tour Group sizes Visitor Education Center Attendance Potential Study (March 2023) prepared by ConsultEcon, Inc. A weighted average of school and adult tour group sizes was used for the Tour Group vehicular occupancy.
2. 2017 National Household Travel Survey, Table 16

Table A-1c. VEC Attendance Potential (Source: Visitorship Study, *Table VI-1: Group Tour Attendance Potential*)

Group Tour Attendance Potential

Data in **Table VI-1** provide a summary of an analysis of the VEC attendance potential from pre-formed school and adult groups whose origin is from beyond fifty miles of the site.

<i>Estimate of Number of Daily Buses by Type During High Season</i> ^{1/}		Average Number of Daily Bus Loads		
		During Peak Season ^{2/}		
Preformed Group Tourists	Factors	Low Range	Mid Range	High Range
School Group Tours ^{3/}		8	12	16
Adult Group Tours		3	4.5	6
Total ^{4/}		11	16.5	22
<i>Estimate of Number of Daily Bus Attendees by Type During High Season</i>		Number of Buses and Bus Occupancy Translated to Average Daily Attendance		
		Low Range Attendance	Mid Range Attendance	High Range Attendance
School Group Tours	Average Group Size 50	400	600	800
Adult Group Tours	40	120	180	240
Total		520	780	1,040
<i>Estimate of Number of Bus Attendees by Type During High Season</i>		Number of Buses and Bus Occupancy Translated to Annual Attendance in High Season		
		Low	Mid	High
School Group Tours	Weeks of High Season 16	44,800	67,200	89,600
Adult Group Tours	16	13,440	20,160	26,880
Total		58,240	87,360	116,480
<i>Note:</i>				
Bus Days Per Week	7			
Assumed Days During High Season	112			
<i>Additional Off Season Bus Tours (Outside of High Season)</i>		Estimate of Off-Season Bus Attendance		
		Low	Mid	High
School Group Tours	10%	4,480	6,720	8,960
Adult Group Tours	25%	3,360	5,040	6,720
Total		7,840	11,760	15,680
Total Group Attendance Potential		Low Range Attendance	Mid Range Attendance	High Range Attendance
School Group Tours		49,280	73,920	98,560
Adult Group Tours		16,800	25,200	33,600
Total Tourist Group Attendees		66,080	99,120	132,160
Rounded		66,000	99,000	132,000

Table A-1d. General Tourist Attendance Potential (Source: Visitorship Study, *Table VI-2: General Tourist Attendance Potential*)

General Tourist Attendance Potential

Data in **Table VI-2** provide a summary of an analysis of the attendance potential from general tourists who reside beyond fifty or more miles from the site or who are staying overnight in the area. Given the large tourist markets to Washington DC and northern Virginia, the approach to estimating the market opportunity from the general tourists is to focus on the segment who are visiting Arlington National Cemetery because these tourists have made the choice of crossing over the Potomac River from Washington DC and the core attractions on the mall.

Table VI-2
Attendance Scenario - General Tourists
VEC - Stable Year of Operations

	Estimated Market Size	Estimated Market Capture Rate For Audience Segment			Low Range Attendance	Mid Range Attendance	High Range Attendance
		Low	Mid	High			
General Tourists to ANC ^{1/2/}	1,750,000	4.00%	6.00%	8.00%	70,000	105,000	140,000
Additional: Other Tourists Who Do Not Visit ANC ^{3/}	33%	Of Tourists Who Do Visit ANC			23,100	34,650	46,200
Total					93,100	139,650	186,200
Rounded (000)					93,000	140,000	186,000

1/ General Tourists are a segment of total ANC visitors defined for this study as the estimated ANC visitors who: reside outside of 50 miles from the site plus all overnight travelers; are not attending a ceremony, event or facility rental; and, those who do not arrive in a structured group. These include leisure and business travelers. Based on data from ANC, non-group "tourists" represent about half of all ANC visitors prior to COVID pandemic. This level of visitation is targeted in the future.

2/ Estimated based on data provided by ANC and Arlington Convention and Visitors Service

This is attendance drawn from the annual visitation to D.C. and to Arlington only who do not visit ANC. Currently, for instance, some 9/11 Pentagon Memorial Visitor visitors do not visit ANC. Also the new VEC will draw other visitors from D.C. and Arlington. This segment is estimated based on the distinct historical topics being presented and the presence of a full visitor center which ANC does not offer. This segment's attendance is limited by the parking resources and accessibility of the site.

3/ Note: Tourist market attendance includes people who are traveling on business and for meetings. This includes such travelers to nearby areas and in particular the Pentagon.

Source: ConsultEcon, Inc.

Table A-1e. General Tourist Attendance Potential (Source: Visitorship Study, *Table VI-3: Attendance Scenario – Resident Market*)

Attendance Scenario - Resident Market
VEC - Stable Year of Operations

Resident Market Area	Estimated 2027 Market Population ^{1/}	Estimated Market Capture Rates by Market Area			Resident Market Visitation Potential Range		
		Low	Mid	High	Low Range Attendance	Mid Range Attendance	High Range Attendance
Primary Market Area (0-10 mile ring)	2,108,700	1.00%	1.50%	2.00%	21,087	31,631	42,174
Secondary Market Area (10- to 30-mile ring)	3,935,600	0.75%	1.13%	1.50%	29,517	44,276	59,034
Tertiary Market Area (30- to 50-mile ring)	2,881,800	0.25%	0.38%	0.50%	7,205	10,807	14,409
Total	8,926,100	0.65%	0.97%	1.30%	57,809	86,713	115,617
Rounded (000)					57,800	86,700	115,600
School Group Market Segment of Resident Attendance							
Percent of Resident Market Attendance in School Groups					10%	15%	20%
Number of Resident Market Attendance in School Groups					5,780	13,005	23,120
Avg Individuals per School Group	30						
Estimated Number of School Groups					193	434	771
High Season as a % of Year Groups	75%						
Average School Groups During High Season					145	325	578
Average Days during High Season	112						
Estimated Daily Resident Market School Groups During High Season					1.3	2.9	5.2

^{1/} Source: ESRI.

Note: The resident market attendance includes people who are employed nearby, and in particular Pentagon employees.

Source: ConsultEcon, Inc.

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Table A-2. Construction Activity Emissions Year 1 and Year 2 (TPY)

Component	Equipment	Equipment/ day ¹	Hrs/Day ¹	Number of Days ¹	Load Factor	SO ₂ (g/hr) ²	SO ₂ (lbs/year)	SO ₂ Total (tons)	CO (g/hr) ²	CO (lbs/year)	CO Total (tons)	NO _x (g/hr) ²	NO _x (lbs/day)	NO _x Total (tons)	PM (g/hr) ²	PM (lbs/year)	PM Total (tons)	CO ₂ (g/hr) ²	CO ₂ (lbs/year)	CO ₂ Total (tons)
Construction	Air Compressors	2	8	40	0.6	0.05000	0.071	0.000	22.69000	32.01	0.010	72.70000	0.59	0.000	0.01	0.000	0.000	20455	28861	7.855
	Plate Compactor	2	8	20	0.6	0.00701	0.005	0.000	7.36797	5.20	0.002	13.48195	1.46	0.000	0.0012	0.00	0.000	30456	21486	5.848
	Welders	4	8	40	0.6	0.02076	0.059	0.000	30.68827	86.60	0.026	37.39866	4.22	0.001	0.0037	0.01	0.000	6417	18107	4.928
	Lifts	4	8	160	0.6	0.08423	0.951	0.000	6.81160	76.89	0.023	60.14621	10.44	0.003	0.0065	0.07	0.000	31799	358934	97.686
	Loader	2	8	60	0.6	0.21000	0.444	0.000	54.97000	116.34	0.035	176.74000	3.09	0.001	0.01	0.02	0.000	77266	163528	44.505
	Paving Equipment	1	8	5	0.6	0.09	0.008	0.000	21.85	1.93	0.001	69.59	0.04	0.000	1	0.09	0.000	30456	2686	0.731
	Roller Compactor	1	8	15	0.6	0.01	0.002	0.000	7.37	1.95	0.001	13.48	0.02	0.000	1	0.26	0.000	30456	8057	2.193
	Excavator	2	8	60	0.6	0.14833	0.314	0.000	15.87538	33.60	0.010	58.06579	0.49	0.000	0.0017	0.00	0.000	54734	115842	31.527
	Dump Trucks	30	8	60	0.6	0.67	21.323	0.000	72.71	2308.19	0.000	704.86	63.93	0.000	1.47	46.67	0.000	248064	7875165	0.000
	Temporary Generator	1	8	20	0.6	0.04	0.014	0.000	27.80	9.80	0.003	2.73	0.02	0.000	0.0022	0.00	0.000	12114	4273	1.163
	Skid Steer	2	8	80	0.6	0.21000	0.593	0.000	54.97000	155.12	0.047	176.74000	6.71	0.002	0.01	0.03	0.000	77266	218038	59.340
	Concrete Truck	8	8	20	0.6	0.67	1.895	0.000	72.71	205.17	0.000	704.86	5.68	0.000	1.47	4.15	0.000	248064	700015	0.000
	Concrete Pump	1	8	20	0.6	0.04	10.782	0.003	30.57	10.78	0.003	77.49	0.08	0.000	0.0028	0.00	0.000	12883	4544	1.237
Hauling and Commuter Calculations																				
Commuter Component	Offsite Vehicle	Roundtrip Mileage per Day ³	Number of Working Days ¹			SO ₂ (g/mile) ⁴	SO ₂ (lbs/year)	SO ₂ Total (tons/year)	CO (g/mile) ⁴	CO (lbs/year)	CO Total (tons)	NO _x (g/mile) ⁴	NO _x Total (lbs/year)	NO _x Total (tons)	PM (g/mile) ⁴	PM (lbs/year)	PM Total (tons)	CO ₂ (g/mile) ⁵	CO ₂ Total (lbs/year)	CO ₂ Total (tons/year)
Construction	Cars	33.8	26400			-	-	-	3.956	7782.35	3.891	0.0647	127	0.064	-	-	-	404	794759.5134	397
	First Year Total																			
	Second Year Total																			
Hauling Component	Offsite Vehicle	Round Trip Mileage/ Day	Hauling Trips	Total VMT		SO ₂ (g/mile) ⁴	SO ₂ (lbs/year)	SO ₂ Total (tons)	CO (g/mile) ⁴	CO (lbs/year)	CO Total (tons)	NO _x (g/mile) ⁴	NO _x (lbs/day)	NO _x Total (tons)	PM (g/mile) ⁴	PM (lbs/year)	PM Total (tons)	CO ₂ (g/mile) ⁵	CO ₂ (lbs/year)	CO ₂ Total (tons)
Construction	HD Trucks	50	1300	65,000		0.0053	0.759		2.000	287		4.169	597		0.106	15		1924.39	275765	
								SO ₂ Total			CO Total			NO _x Total			PM Total			CO ₂ Total
Project Total Equipment Emissions *																				
Project Total Commuter Emissions																				
Project Total Hauling Emissions																				
Project Estimated Emissions (tons)																				
EPA De Minimis Thresholds (tons/year)																				
First Year Estimated Annual Emissions (tons/year)																				
Second Year Estimated Annual Emissions (tons/year)																				
Significant (Yes/No)																				

Notes:

* Project components have overlapping construction schedules. The total emissions in lbs/day assumes all equipment running at the same time, regardless of schedule, resulting in conservative maximum daily emission estimates.

* Project total emissions shown in Tons is for the complete project, which occurs over more than one year, resulting in conservative emission estimates. EPA De Minimis Thresholds are based on Tons/Year.

Source Data:

¹ Equipment assumptions provided by Davis Construction staff based on similar past construction projects; load factors provided by EPA (2010) *Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emission Modeling*.

² Motor Vehicle Emission Simulator Version 3.0 (MOVES) Emission Factors in g/operating hour listed by SCC Generated on 08/09/2021 16:12:46. Equipment is assumed to be diesel for conservative emission estimates.

³ Estimate for commuter distance from project site found in the Metropolitan Washington Council of Governments State of the Commute Survey Report.

⁴ USDOT Table 4-43: Estimated National Average Vehicle Emissions Rates per Vehicle by Vehicle Type using Gasoline and Diesel (Grams per mile) accessed August 2020 at <https://www.bts.gov/content/estimated-national-average-vehicle-emissions-rates-vehicle-type-using-gasoline-and-diesel>

⁵ USEPA Greenhouse Gas Emissions from a Typical Passenger Vehicle accessed August 2021 at <https://www.epa.gov/greenvehicles/greenhouse-gas-emissions-typical-passenger-vehicle#driving>.

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Table A-3. Operations Emissions for VEC (TPY)

Operations Emissions															GHG		
Vehicle Types	vehicles per Year	Miles per trip	SO ₂ - Diesel engines only			CO			"NOX"			PM - Diesel engines only			CO ₂ Emission ² (g/mile)	CO ₂ (lbs/day)	CO ₂ Total (tons/year)
			SO ₂ Emission Factor ¹ (g/mile)	SO ₂ (lbs/year)	SO ₂ Total (tons/ year)	CO Emission Factor ¹ (g/mile)	CO (lbs/year)	CO Total (tons/ year)	N ₂ O Emission Factor ¹ (g/mile)	N ₂ O (lbs/day)	N ₂ O Total (tons)	PM Emission Factor ¹ (g/mile)	PM (lbs/day)	PM Total (tons)			
cars	18879.97768	10	-	-	-	3.956	1646.6129	0.82330643	0.0647	26.9302	0.0134651	-	-	-	404	168157.63	84.0788163
	137261.573	30	-	-	-	3.956	35913.708	17.9568542	0.0647	587.3653	0.2936826	-	-	-	404	3667628.5	1833.81423
	6450.457589	50	-	-	-	3.956	2812.8758	1.40643789	0.0647	46.00431	0.0230022	-	-	-	404	287260.32	143.630159
	84233.33333	100	-	-	-	3.956	73463.906	36.7319528	0.0647	1201.495	0.6007476	-	-	-	404	7502380.6	3751.19032
diesel cars	993.6830357	10	0.0031	0.0679115	3.39557E-05	3.640	79.741243	0.03987062	0.129	2.825995	0.001413	0.002	0.0438139	2.191E-05	462.7272727	10136.936	5.06846813
	7224.293317	30	0.0031	1.4811944	0.000740597	3.640	1739.2089	0.86960446	0.129	61.6368	0.0308184	0.002	0.9556093	0.0004778	462.7272727	221093.24	110.54662
	339.4977679	50	0.0031	0.1160119	5.80059E-05	3.640	136.22037	0.06811018	0.129	4.82759	0.0024138	0.002	0.0748464	3.742E-05	462.7272727	17316.725	8.65836265
	4433.333333	100	0.0031	3.0298828	0.001514941	3.640	3557.6688	1.77883439	0.129	126.0822	0.0630411	0.002	1.9547631	0.0009774	462.7272727	452261.09	226.130546
diesel bus	439.3125	10	0.0125	0.1210646	6.05323E-05	2.000	19.370342	0.00968517	4.169	40.37748	0.0201887	0.106	1.0266282	0.0005133	1641.935484	15902.426	7.95121316
	614.9375	30	0.0125	0.5083888	0.000254194	2.000	81.342211	0.04067111	4.169	169.5578	0.0847789	0.106	4.3111372	0.0021556	1641.935484	66779.331	33.3896655
	150.09375	50	0.0125	0.2068123	0.000103406	2.000	33.089968	0.01654498	4.169	68.97604	0.034488	0.106	1.7537683	0.0008769	1641.935484	27165.797	13.5828983
	2811.2	100	0.0125	7.7470347	0.003873517	2.000	1239.5255	0.61976277	4.169	2583.791	1.2918955	0.106	65.694854	0.0328474	1641.935484	1017610.5	508.805245
Total					0.00663915			60.361635			2.4599349			0.0379077			6726.84655

Appendix C

Federal Consistency Determination Coastal Zone Management Act



Commonwealth of Virginia

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

www.deq.virginia.gov

Travis A. Voyles
Secretary of Natural and Historic Resources

Michael S. Rolband, PE, PWD, PWS Emeritus
Director

August 14, 2024

Mr. Scott Lonesome
Department of the Army
Arlington National Cemetery
Sent via email: scott.l.lonesome.civ@army.mil

RE: Department of the Army Arlington National Cemetery Draft Environmental Assessment and Federal Consistency Determination: 9/11 Pentagon Memorial Visitor Education Center, Arlington County (DEQ 24-101F)

Dear Mr. Lonesome:

The Commonwealth of Virginia has completed its review of the draft Environmental Assessment (EA) and a federal consistency determination (FCD) for the above-referenced project. The Department of Environmental Quality (DEQ) is responsible for coordinating Virginia's review of federal environmental documents prepared pursuant to the National Environmental Policy Act (NEPA) and responding to appropriate federal officials on behalf of the Commonwealth. DEQ is also responsible for coordinating state reviews of FCDs submitted under the Coastal Zone Management Act. This letter is in response to the above-referenced EA, received on June 27, 2024 and FCD, received on June 24, 2024. On June 27, 2024, Arlington National Cemetery agreed to a 60-day, concurrent review of the EA and FCD (email, Scott Lonesome). The following agencies participated in this review:

Department of Environmental Quality
Department of Conservation and Recreation
Department of Health

The Department of Wildlife Resources, Department of Historic Resources, Department of Transportation, Northern Virginia Regional Commission and Arlington County also were invited to comment.

PROJECT DESCRIPTION

Arlington National Cemetery (ANC) submitted an EA and FCD for the proposed construction of a visitor education center (VEC) at the 9/11 Pentagon Memorial in Arlington County. The Pentagon Memorial Fund intends to construct and operate the visitor education center on land owned by Army National Military Cemeteries and located on the grounds of Arlington National Cemetery (ANC) in Arlington County. The ANC proposes to grant a license to the Pentagon Memorial Fund for use of the site. The proposed 3.71-acre project site, which is immediately southwest of the Pentagon and the existing 9/11 Pentagon Memorial, would contain a building and a parking lot with approximately 100 spaces. The building would require a site footprint of between 25,000 and 30,000 square feet to support a program area between 46,500 and 50,000 square feet. In addition to the no-build alternative, four build alternatives are being considered. All build alternatives are on the same parcel of land, which is bound by realigned Columbia Pike, South Joyce Street and South Washington Boulevard. The preferred alternative (Alternative 3) locates the VEC at the low end of the site to the north, requiring that the building have two fronts, one from the southern parking area and the other from the north. The structure is oriented towards both the Pentagon Memorial site and the parking area. The height of the building at the first floor is approximately 36' and the maximum elevation of the building under this alternative is 91', resulting in this being the alternative with the lowest elevation. According to the EA, this alternative provides a more direct procession through the site and with the Pentagon Memorial.

FEDERAL CONSISTENCY UNDER THE COASTAL ZONE MANAGEMENT ACT

This FCD is submitted pursuant to the federal consistency regulation 15 Code of Federal Regulations Part 930 Subpart C Section 930.31. Pursuant to the Coastal Zone Management Act of 1972, as amended, federal activities located inside or outside of Virginia's designated coastal management area that can have reasonably foreseeable effects on coastal resources or coastal uses must, to the maximum extent practicable, be implemented in a manner consistent with the Virginia Coastal Zone Management (CZM) Program. The Virginia CZM Program consists of a network of programs administered by several agencies. In order to be consistent with the Virginia CZM Program, the project activities must be consistent with the enforceable policies of the Virginia CZM Program and all the applicable permits and approvals listed under the enforceable policies of the Virginia CZM Program must be obtained prior to commencing the project. DEQ coordinates the review of FCDs with agencies administering the enforceable and advisory policies of the Virginia CZM Program.

PUBLIC PARTICIPATION

In accordance with 15 CFR §930.2, a public notice of this proposed action was published in the DEQ Office of Environmental Impact Review Program Public Notice Bulletin and on the DEQ website from July 1, 2024 to July 24, 2024. No public comments were received in response to the notice.

FEDERAL CONSISTENCY CONCURRENCE

The FCD states that the project is consistent to the maximum extent practicable with the enforceable policies of the Virginia CZM Program. The reviewing agencies that are responsible for the administration of the enforceable policies generally agree with the FCD. Based on the review of the FCD and the comments submitted by agencies administering the enforceable policies of the Virginia CZM Program, DEQ concurs that the proposed project is consistent to the maximum extent practicable with the Virginia CZM Program, provided all applicable permits and approvals are obtained as described below. However, other state approvals which may apply to this project are not included in this FCD. Therefore, the federal agency must also ensure that this project is constructed and operated in accordance with all applicable federal, state and local laws and regulations. In addition, in accordance with 15 CFR Part 930, subpart C, § 930.39(c), we recommend that the responsible party consider the Advisory Policies of the Virginia CZM Program (<https://www.deq.virginia.gov/our-programs/environmental-impact-review/federal-consistency>).

If, prior to construction, the project should change significantly and any of the enforceable policies of the Virginia CZM Program would be affected, pursuant to 15 CFR 930.46, the federal agency must submit supplemental information to DEQ for review and approval.

ENVIRONMENTAL IMPACTS AND MITIGATION

1. Point Source Air Pollution. The EA (page 19) states that based on the project scope and operations, the emissions associated with the construction and vehicle operations (commuter cars and buses) for visitation to the new 9/11 Pentagon Memorial VEC would not be a significant source of air pollution within the Washington metropolitan area.

1(a) Agency Jurisdiction. The DEQ Air Division, on behalf of the State Air Pollution Control Board, is responsible for developing regulations that implement Virginia's Air Pollution Control Law (Virginia Code §10.1-1300 et seq.). DEQ is charged with carrying out mandates of the state law and related regulations as well as Virginia's federal obligations under the Clean Air Act as amended in 1990. The objective is to protect and enhance public health and quality of life through control and mitigation of air pollution. The division ensures the safety and quality of air in Virginia by monitoring and analyzing air quality data, regulating sources of air pollution, and working with local, state and federal agencies to plan and implement strategies to protect Virginia's air quality. The appropriate DEQ regional office is directly responsible for the issuance of necessary permits to construct and operate all stationary sources in the region as well as monitoring emissions from these sources for compliance. As a part of this mandate, environmental impact reviews (EIRs) of projects to be undertaken in the state are also reviewed. In the case of certain projects, additional evaluation and demonstration must be made under the general conformity provisions of state and federal law.

The Air Division regulates emissions of air pollutants from industries and facilities and implements programs designed to ensure that Virginia meets national air quality standards. The most common regulations associated with projects are:

- Open burning: 9 VAC 5-130 *et seq.*
- Fugitive dust control: 9 VAC 5-50-60 *et seq.*
- Permits for fuel-burning equipment: 9 VAC 5-80-1100 *et seq.*

1(b) Requirements. The following requirements may be applicable to the proposed project.

1(b)(i) Fugitive Dust. During land-disturbing activities, fugitive dust must be kept to a minimum by using control methods outlined in 9VAC5-50-60 *et seq.* of the Regulations for the Control and Abatement of Air Pollution. These precautions include, but are not limited to, the following:

- Use, where possible, of water or suitable chemicals for dust control during the proposed demolition and construction operations and from material stockpiles;
- Installation and use of hoods, fans and fabric filters to enclose and vent the handling of dusty materials;
- Covering of open equipment for conveying materials; and
- Prompt removal of spilled or tracked dirt or other materials from paved streets and removal of dried sediments resulting from soil erosion.

1(b)(ii) Open Burning. Should any open burning or use of special incineration devices be employed in the disposal of land clearing debris during demolition and construction, the operation would be subject to the Open Burning Regulation 9 VAC 5-130-10 through 9 VAC 5-130-60 and 9 VAC 5-130-100. The regulations provide for, but do not require, the local adoption of a model ordinance concerning open burning. Contact officials with the locality to determine what local requirements, if any, exist.

1(b)(iii) Fuel-Burning Equipment. Fuel-burning equipment (generators, compressors, etc.) or any other air-pollution-emitting equipment may be subject to registration or permitting requirements.

1(b)(iv) Stationary Source. Stationary air emissions sources constructed at this location may be subject to 9 VAC 5-80-1120. The regulation requires obtaining an air permit before starting actual construction of, or operation of any new stationary source. Any changes that affect the impact of the facilities on air quality may require an air permit.

1(c) Conclusion. Provided the project complies with applicable requirements, it would be consistent to the maximum extent practicable with the point source air pollution enforceable policy of the Virginia CZM Program.

2. Tidal and Non-Tidal Wetlands. The EA (page 26) states that for any build alternative, there would be no direct or indirect impacts to wetlands or waters of the U.S. as these resources are not present on-site.

2(a) Agency Jurisdiction. The State Water Control Board promulgates Virginia's water regulations covering a variety of permits to include the [Virginia Pollutant Discharge Elimination System Permit](#) regulating point source discharges to surface waters, Virginia Pollution Abatement Permit regulating sewage sludge, storage and land application of biosolids, industrial wastes (sludge and wastewater), municipal wastewater, and animal wastes, the [Surface and Groundwater Withdrawal Permit](#), and the [Virginia Water Protection \(VWP\) Permit](#) regulating impacts to streams, wetlands, and other surface waters. The VWP permit is a state permit which governs activities in state surface waters including wetlands, and certain surface water withdrawals, diversion, and impoundments. It also may serve as Section 401 Water Quality Certification of the federal licenses and permits under the Clean Water Act. The VWP Permit Program is under the Office of Wetlands and Stream Protection, within the DEQ Division of Water Permitting. Six DEQ regional offices perform permit application reviews and issue permits or coverages for the covered activities.

- Clean Water Act Sections 404 and 401 (33 U.S.C. § 1251 *et seq.*);
- Section 404(b)(i) Guidelines Mitigation Memorandum of Agreement (2/90) (40 CFR Part 230);
- State Water Control Law, Chapter 3.1 of Title 62.1 of the Code of Virginia; and
- State Water Control Board regulations 9VAC25-210 *et seq.*; 9VAC25-660 *et seq.*; 9VAC25-670 *et seq.*; 9VAC25-680 *et seq.*; and 9VAC25-690 *et seq.*

2(b) Agency Findings. The DEQ Northern Regional Office (NRO) states that measures should be taken to avoid and minimize impacts to surface waters and wetlands during construction activities. Even if there will be no intentional placement of fill material in jurisdictional waters, potential water quality impacts resulting from construction site surface runoff must be minimized. This can be achieved by using Best Management Practices (BMPs).

2(c) Requirements. The project manager is reminded that a Virginia Water Protection (VWP) Permit from DEQ may be required should impacts to surface waters be necessary. The disturbance of surface waters or wetlands may require prior approval by DEQ and/or the U.S. Army Corps of Engineers (Corps). The Corps is the authority for an official confirmation of whether there are federal jurisdictional waters, including wetlands, which may be impacted by the proposed project. DEQ may confirm additional waters as jurisdictional beyond those under

federal authority. Review of National Wetland Inventory maps or topographic maps for locating wetlands or streams may not be sufficient; there may need to be a site-specific review of the site by a qualified professional.

If construction activities will occur in or along any streams (perennial, intermittent, or ephemeral), open water or wetlands, the applicant should contact DEQ NRO VWP Permit Program to determine the need for any permits prior to commencing work that could impact surface waters or wetlands. Upon receipt of a Joint Permit Application for the proposed surface water impacts, DEQ VWP Permit staff will review the proposed project in accordance with the VWP permit program regulations and current VWP permit program guidance. VWP staff reserve the right to provide comment upon receipt of a permit application requesting authorization to impact state surface waters, and at such time that a wetland delineation has been conducted and associated jurisdiction determination made by the Corps.

2(d) Conclusion. Provided adherence any applicable requirements, the project would be consistent to the maximum extent practicable with the tidal and non-tidal wetlands enforceable policy of the Virginia CZM Program.

3. Chesapeake Bay Preservation Areas. The FCD (page 12) states that the proposed action would not result in development of any Chesapeake Bay Preservation Areas designated by Arlington County. However, the EA (page 26) states that during the scoping process and in coordination with DEQ, it was determined that the project must adhere to all requirements related to land development on RMA lands.

3(a) Agency Jurisdiction. The DEQ Office of Watershed and Local Government Assistance Programs administers the Chesapeake Bay Preservation Act (Virginia Code §62.1-44.15:67 *et seq.*) and Chesapeake Bay Preservation Area Designation and Management Regulations (9VAC25-830-10 *et seq.*). Each Tidewater locality must adopt a program based on the Chesapeake Bay Preservation Act and the Chesapeake Bay Preservation Area Designation and Management Regulations. The Act and regulations recognize local government responsibility for land use decisions and are designed to establish a framework for compliance without dictating precisely what local programs must look like. Local governments have flexibility to develop water quality preservation programs that reflect unique local characteristics and embody other community goals. Such flexibility also facilitates innovative and creative approaches in achieving program objectives. The regulations address nonpoint source pollution by identifying and protecting certain lands called Chesapeake Bay Preservation Areas. The regulations use a resource-based approach that recognizes differences between various land forms and treats them differently.

3(b) Chesapeake Bay Preservation Area. In Arlington County, the areas protected by the Chesapeake Bay Preservation Act, as locally implemented, require conformance with

performance criteria. These areas include Resource Protection Areas (RPAs) and Resource Management Areas (RMAs) as designated by each locality. RPAs include tidal wetlands, certain non-tidal wetlands and tidal shores. RPAs also include a 100-foot vegetated buffer area located adjacent to and landward of these features and along both sides of any water body with perennial flow. All areas of the county not included in the RPA are designated as RMAs.

3(c) Agency Findings. The DEQ Office of Watershed and Local Government Assistance Programs (OWLGAP) states that while lands analogous to RPA are not present on site, Arlington County's jurisdiction-wide RMA means that lands analogous to RMAs are present within the proposed project area.

3(d) Requirements. Pursuant to the *Coastal Zone Management Act of 1972*, as amended, federal activities affecting Virginia's coastal resources or coastal uses must be conducted in a manner "consistent to the maximum extent practicable" and be consistent with Virginia's Coastal Zone Management Program (see § 307(c)(1) of the Coastal Zone Management Act and 15 CFR Part 930, sub-part C of the *Federal Consistency Regulations*).

While Chesapeake Bay Preservation Areas (CBPA) are not locally designated on federal lands, this does not relieve federal agencies of their responsibility to be consistent with the provisions of the Regulations, 9VAC25-830-10 *et seq.*, as one of the enforceable programs of the CZM Program. Federal actions on installations located within Tidewater Virginia are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated CBPA's. Projects that include land disturbing activity must adhere to the general performance criteria, especially with respect to minimizing land disturbance (including access and staging areas), retaining indigenous vegetation and minimizing impervious cover. For land disturbance over 2,500 square feet, the project must comply with the requirements of the current version of the *Virginia Erosion and Sediment Control Handbook*. Additionally, stormwater management criteria consistent with water quality protection provisions of the *Virginia Stormwater Management Regulations* shall be satisfied.

3(e) Conclusion. Provided the project adheres to the above-referenced requirements, the project would be consistent to the maximum extent practicable with the Chesapeake Bay Preservation Areas enforceable policy of the Virginia CZM Program.

4. Erosion and Sediment Control and Stormwater Management. The EA (page 26) states that permits would be required for construction (e.g., VPDES permit for Stormwater Discharges from Construction Activities), and design of the VEC must meet both the Virginia Stormwater Management Program (VSMP) Regulation (9 VAC 25-870) and Virginia Erosion and Sediment Control Regulations.

4(a) Agency Jurisdiction. The DEQ Office of Stormwater Management (OSM) administers the following laws and regulations governing construction activities:

- Virginia Erosion and Sediment Control Law (VESCL) (§ 62.1-44.15:51 *et seq.*);
- Virginia Stormwater Management Act (VSMA) (§ 62.1-44.15:24 *et seq.*);
- Virginia Erosion and Stormwater Management Regulation (9VAC25-875 *et. seq.*) and
- 2024 General Virginia Pollutant Discharge Elimination System (VPDES) Permit for Discharges of Stormwater from Construction Activities (9VAC25-875 *et. seq.*).

In addition, DEQ is responsible for VSMP General Permit for Stormwater Discharges from Construction Activities related to Municipal Separate Storm Sewer Systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program (9VAC25-890-40).

4(b) Requirements.

4(b)(i) Erosion and Sediment Control and Stormwater Management Plans. The applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with Virginia Erosion and Stormwater Management Regulation and associated laws, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Clearing and grading activities, installation of staging areas, parking lots, roads, buildings, utilities, borrow areas, soil stockpiles, and related land-disturbing activities that result in the total land disturbance of equal to or greater than 2,500 square feet on lands analogous to a Chesapeake Bay Preservation Area would be regulated by Virginia Erosion and Stormwater Management Regulation. Accordingly, the applicant must prepare and implement an erosion and sediment control (ESC) plan to ensure compliance with state law and regulations. Land-disturbing activities that result in the total land disturbance of equal to or greater than 2,500 square feet on lands analogous to a Chesapeake Bay Preservation Area would be regulated by the Virginia Erosion and Stormwater Management Regulation and associated laws. Accordingly, the applicant must prepare and implement a stormwater management (SWM) plan to ensure compliance with state law and regulations. The ESC/SWM plan should be submitted to the DEQ regional office that serves the area where the project is located for review and compliance. The applicant is ultimately responsible for achieving project compliance through oversight of on-site contractors, regular field inspection, prompt action against non-compliant sites, and other mechanisms consistent with agency policy (Reference: VESCL 62.1-44.15 *et seq.*).

4(b)(ii) General Permit for Stormwater Discharges from Construction Activities (VAR10). DEQ is responsible for the issuance, denial, revocation, termination and enforcement of the Virginia Stormwater Management Program (VSMP) General Permit for Stormwater

Discharges from Construction Activities related to municipal separate storm sewer systems (MS4s) and construction activities for the control of stormwater discharges from MS4s and land disturbing activities under the Virginia Stormwater Management Program.

The owner or operator of projects involving land-disturbing activities of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project-specific Stormwater Pollution Prevention Plan. Construction activities requiring registration also include land disturbance of less than one acre of total land area that is part of a larger common plan of development or sale if the larger common plan of development will collectively disturb equal to or greater than one acre. The SWPPP must be prepared prior to submission of the registration statement for coverage under the general permit and the SWPPP must address water quality and quantity in accordance with the VSMP Permit Regulations (Reference: Virginia Stormwater Management Act 62.1-44.15 *et seq.*; VSMP Permit Regulations 9VAC25-880 *et seq.*).

4(c) Agency Recommendations. DEQ NRO states that consideration should also be given to using permeable paving for parking areas and walkways where appropriate, and denuded areas should be promptly revegetated following construction work.

4(d) Conclusion. Assuming adherence to the applicable above-reference requirements, the project would be consistent to the maximum extent practicable with the nonpoint source pollution control management enforceable policy of the Virginia CZM Program.

5. Public Drinking Water. The EA (page 59) states that two underground lines provide potable water in the project area.

5(a) Agency Jurisdiction. The Virginia Department of Health (VDH) Office of Drinking Water (ODW) reviews projects for the potential to impact public drinking water sources (groundwater wells, springs and surface water intakes). VDH administers both federal and state laws governing waterworks operation.

5(b) Agency Findings. The VDH ODW states that there are no apparent impacts to public drinking water sources due to this project.

6. Pesticides and Herbicides. In general, when pesticides or herbicides must be used, their use should be strictly in accordance with manufacturers' recommendations. In addition, DEQ recommends that the responsible agent use the least toxic pesticides or herbicides effective in controlling the target species. For more information on pesticide or herbicide use, please contact the Virginia Department of Agriculture and Consumer Services (804-371-6560).

7. Natural Heritage Resources. The EA (page 29) states that the project area is currently a mowed area inside the southwest cloverleaf of the Washington Boulevard (Route 27)/Columbia Pike interchange. This cloverleaf serves as the southbound off-ramp from Washington Boulevard to eastbound Columbia Pike, leading to the entrance to the Pentagon just to the east. There are a few small trees and shrubs in the cloverleaf's northeast corner adjacent to the Washington Boulevard overpass of Columbia Pike. The habitat value of the site is negligible.

7(a) Agency Jurisdiction.

7(a)(i) The Virginia Department of Conservation and Recreation's (DCR) Division of Natural Heritage (DNH): DNH's mission is conserving Virginia's biodiversity through inventory, protection and stewardship. The Virginia Natural Area Preserves Act (Virginia Code §10.1-209 through 217), authorized DCR to maintain a statewide database for conservation planning and project review, protect land for the conservation of biodiversity, and to protect and ecologically manage the natural heritage resources of Virginia (the habitats of rare, threatened and endangered species, significant natural communities, geologic sites, and other natural features).

7(a)(ii) The Virginia Department of Agriculture and Consumer Services (VDACS): The Endangered Plant and Insect Species Act of 1979 (Virginia Code Chapter 39 §3.1-1020 through 1030) authorizes VDACS to conserve, protect and manage endangered and threatened species of plants and insects. Under a Memorandum of Agreement established between VDACS and the DCR, DCR represents VDACS in comments regarding potential impacts on state-listed threatened and endangered plant and insect species.

7(b) Agency Findings – Natural Heritage. According to the information currently in the Biotics Data System, natural heritage resources have not been documented within the submitted project boundary, including a 100-foot buffer. The absence of data may indicate that the project area has not been surveyed, rather than confirm that the area lacks natural heritage resources. In addition, the project boundary does not intersect any of the predictive models identifying potential habitat for natural heritage resources.

7(c) Agency Findings – Threatened and Endangered Plant and Insect Species. The current activity will not affect any documented state-listed plants or insects.

7(d) Agency Findings – State Natural Area Preserves. There are no State Natural Area Preserves under DCR's jurisdiction in the project vicinity.

7(e) Agency Recommendations. Contact the DCR DNH and resubmit project information and a map if the scope of the project changes and/or six months has passed before it is utilized.

8. Solid and Hazardous Waste Management. The EA (pages 65-66) states that the southwestern portion of the VEC site along S. Joyce Street is located in an area previously within the Navy Annex area. As documented in the Southern Expansion EA, hazardous materials including petroleum products, above ground storage tanks, underground storage tanks, and buildings with asbestos containing materials were present in the Navy Annex area prior to demolition in 2013. Subsequent to demolition efforts, the Washington Headquarters Services completed a limited soil remediation of asbestos containing materials in 2015 due to their presence in soils. Additional soil sampling was performed in 2016 to assess potential environmental impacts during construction of the Southern Expansion project, which indicated low levels of arsenic, chromium, and polycyclic aromatic hydrocarbons (PAH) in the soil. The risk of exposure to previously documented hazardous materials in the southwestern portion of the site is low based on remedial efforts completed to date. Should contaminated soils be encountered during soil investigations and construction activities, these soils would be handled per federal and state regulations. Both construction and operations phases of the VEC would result in the generation of solid waste.

8(a) Agency Jurisdiction. On behalf of the Virginia Waste Management Board, the DEQ Division of Land Protection and Revitalization is responsible for carrying out the mandates of the Virginia Waste Management Act (Virginia Code §10.1-1400 *et seq.*), as well as meeting Virginia's federal obligations under the Resource Conservation and Recovery Act (RCRA) and the Comprehensive Environmental Response Compensation Liability Act (CERCLA), commonly known as Superfund. The DEQ Division of Land Protection and Revitalization also administers those laws and regulations on behalf of the State Water Control Board that govern Petroleum Storage Tanks (Virginia Code §62.1-44.34:8 *et seq.*), including Aboveground Storage Tanks (9VAC25-91 *et seq.*) and Underground Storage Tanks (9VAC25-580 *et seq.* and 9VAC25-580-370 *et seq.*), also known as Virginia Tank Regulations, and § 62.1-44.34:14 *et seq.* which covers oil spills.

Virginia:

- Virginia Waste Management Act, Virginia Code § 10.1-1400 *et seq.*
- Virginia Solid Waste Management Regulations, 9VAC20-81
 - (9VAC20-81-620 applies to asbestos-containing materials)
- Virginia Hazardous Waste Management Regulations, 9VAC20-60
 - (9VAC20-60-261 applies to lead-based paints)
- Virginia Regulations for the Transportation of Hazardous Materials, 9VAC20-110.

Federal:

- Resource Conservation and Recovery Act (RCRA), 42 U.S. Code sections 6901 *et seq.*
- U.S. Department of Transportation Rules for Transportation of Hazardous Materials, 49 Code of Federal Regulations, Part 107

- Applicable rules contained in Title 40, Code of Federal Regulations.

8(b) Database Search. The DEQ Division of Land Protection and Revitalization (DLPR) conducted a search (200-foot radius) of the project area of solid and hazardous waste databases (including petroleum releases) to identify waste sites in close proximity to the project area. DLPR identified one (1) petroleum release site within the project area which might impact the project: PC Number 19954100, Navy Annex Gas Station, 801 S Joy St, Arlington, Virginia, Release Date: 10/19/1994, Status: Closed.

8(c) Agency Recommendations. Evaluate the identified petroleum release to determine if it may affect project site, if not already conducted. DEQ encourages all projects to implement pollution prevention principles, including:

- the reduction, reuse and recycling of all solid wastes generated; and
- the minimization and proper handling of generated hazardous wastes.

8(d) Requirements.

- The project manager is reminded that if any solid or hazardous waste is generated/encountered during construction, the project manager would follow applicable federal, state, and local regulations for their disposal.
- The removal, relocation or closure or installation/operation of any regulated petroleum storage tanks, aboveground storage tank (AST) or underground storage tank (UST), must be conducted in accordance with the requirements of the Virginia Tank Regulations 9 VAC 25-91-10 *et seq.* (AST) and / or 9 VAC 25-580-10 *et seq.* (UST). Submit appropriate documentation to DEQ.
- Test and dispose of any soil/sediment that is suspected of contamination or wastes that are generated during construction-related activities in accordance with applicable federal, state, and local laws and regulations.
- Any future site activities involving excavation or disturbance of formerly petroleum contaminated soils and or groundwater must be reported to DEQ, as authorized by Virginia Code § 62.1-44.34.8 through 9 and 9 VAC 25-580-10 *et seq.*
- Petroleum-contaminated soils and ground water generated during implementation of this project must be properly characterized and disposed of properly.
- All construction and demolition waste, including any excess soil, must be characterized in accordance with the Virginia Hazardous Waste Management Regulations and disposed of at an appropriate facility as applicable.
- If evidence of a petroleum release is discovered during implementation of this project, it must be reported to DEQ, as authorized by Code of Virginia 62.1-44.34.8 through 19 and 9VAC 25-580-10 *et seq.*

9. Floodplain Management. The EA (page 25) states that the project is not within 100-year or 500-year floodplains.

9(a) Agency Jurisdiction. DCR is the lead coordinating agency for the Commonwealth's floodplain management program and the National Flood Insurance Program (Code of Virginia § 10.1-602).

9(b) Agency Findings. The National Flood Insurance Program (NFIP) is administered by Federal Emergency Management Agency (FEMA) and communities who elect to participate in this voluntary program manage and enforce the program on the local level through that community's local floodplain ordinance. Each local floodplain ordinance must comply with the minimum standards of the NFIP, outlined in 44 CFR 60.3; however, local communities may adopt more restrictive requirements in their local floodplain ordinance, such as regulating the 0.2% annual chance flood zone (Shaded X Zone).

The DCR Floodplain Management Program does not have regulatory authority for projects in the Special Flood Hazard Area (SFHA). The applicant/developer must contact the local floodplain administrator for an official floodplain determination and comply with the community's local floodplain ordinance, including receiving a local permit. Failure to comply with the local floodplain ordinance could result in enforcement action from the locality. For federal projects, the applicant/developer is encouraged to contact the local floodplain administrator and comply with the community's local floodplain ordinance.

9(c) Requirements. The following may be applicable:

- All development within a SFHA, as shown on the locality's Flood Insurance Rate Map (FIRM), must be permitted and comply with the requirements of the local floodplain ordinance.
- Projects conducted by federal agencies within the SFHA must comply with federal Executive Order 11988: Floodplain Management.

10. Point Source Water Pollution. The EA (page 26) states that water quality and quantity treatment requirements would be met on site prior to discharge to existing conveyances.

10(a) Agency Jurisdiction. The policy is administered by DEQ to protect existing high quality state waters and restore all other state waters to permit all reasonable public uses and support the propagation and growth of all aquatic life. Legal authority is granted by the National Pollutant Discharge Elimination System (NPDES) permit program established pursuant to Section 402 of the federal Clean Water Act and administered by DEQ as the Virginia Pollutant Discharge Elimination System (VPDES) permit program (*Virginia Code § 62.1-44.2; 9 VAC § 25-31-20*).

10(b) Requirements. DEQ NRO states that a construction project may require coverage under the VAG83 permit for discharges from petroleum contaminated sites, groundwater remediation, and hydrostatic tests for any hydrostatics tests on any new piping installed, or for any potential dewatering during construction if petroleum contamination is encountered.

10(d) Conclusion. Provided the project adheres to any requirements, it would be consistent to the maximum extent practicable with the point source water pollution enforceable policy of the Virginia CZM Program.

REGULATORY AND COORDINATION NEEDS

1. Air Quality Regulations. The following regulations may apply during construction or operation:

- fugitive dust and emissions control (9VAC5-50-60 *et seq.*)
- permits for fuel-burning equipment (9VAC5-80-110 *et seq.*)
- open burning restrictions (9VAC5-130 *et seq.*)
- stationary air emissions (9 VAC 5-80-1120)

Contact officials with the appropriate locality for information on any local requirements pertaining to open burning if necessary. Contact DEQ NRO (David Hartshorn at 571.408.1778 or r.david.hartshorn@deq.virginia.gov) for additional information as necessary.

2. Water Quality and Wetlands. If construction activities will occur in or along any streams (perennial, intermittent, or ephemeral), open water or wetlands, the applicant should contact the DEQ NRO VWP Permit Program (Margaret Dannemann at 571-866-6485 or margaret.dannemann@deq.virginia.gov) to determine the need for any permits prior to commencing work that could impact surface waters or wetlands.

3. Chesapeake Bay Preservation Areas. While Chesapeake Bay Preservation Areas are not locally designated on federal lands, this does not relieve federal agencies of their responsibility to be consistent with the provisions of the Chesapeake Bay Preservation Area Designation and Management Regulations (Regulations), 9VAC25-830-10 *et seq.*, as one of the enforceable programs of the Virginia CZM Program. Federal actions on installations located within Tidewater Virginia are required to be consistent with the performance criteria of the Regulations on lands analogous to locally designated CBPAs. Projects that include land disturbing activity must adhere to the general performance criteria, especially with respect to minimizing land disturbance (including access and staging areas), retaining indigenous vegetation and minimizing impervious cover. For land disturbance over 2,500 square feet, the project must comply with the requirements of the current version of the *Virginia Erosion and Sediment Control Handbook*. Additionally, stormwater management criteria consistent with water quality protection provisions

of the *Virginia Stormwater Management Regulations* shall be satisfied. For questions, contact the DEQ Office of Watersheds and Local Government Assistance Programs (Daniel Moore at Daniel.Moore@deq.virginia.gov).

4. Erosion and Sediment Control and Stormwater Management Plans. The applicant and its authorized agents conducting regulated land-disturbing activities on private and public lands in the state must comply with Virginia Erosion and Stormwater Management Regulation, including coverage under the general permit for stormwater discharge from construction activities, and other applicable federal nonpoint source pollution mandates (e.g. Clean Water Act-Section 313, federal consistency under the Coastal Zone Management Act). Submit the ESC and SWM plans to DEQ NRO (Reference: Virginia Erosion and Stormwater Management Regulation, 9VAC25-875 *et. seq.*). Coordinate with DEQ NRO (Mark Remsberg at 703-583-3874 or mark.remmsberg@deq.virginia.gov).

5. General Permit for Stormwater Discharges from Construction Activities (VAR10). The operator or owner of a construction activity involving land disturbance of equal to or greater than 1 acre is required to register for coverage under the General Permit for Discharges of Stormwater from Construction Activities and develop a project specific stormwater pollution prevention plan (SWPPP). Coordinate with DEQ NRO (Mark Remsberg at 703-583-3874 or mark.remmsberg@deq.virginia.gov) as necessary.

6. Natural Heritage Resources. Contact the DCR DNH (804-371-2708) about its recommendation to re-submit project information and a map for an update on natural heritage information if the scope of the project changes and/or six months has passed before it is utilized.

7. Solid Waste and Hazardous Substances. All solid waste, hazardous waste, and hazardous materials must be managed in accordance with all applicable federal, state, and local environmental regulations. If free product, discolored soils, or other evidence of contaminated soils are encountered, contact DEQ NRO (Jim Datko at 571-866-6446 or james.datko@deq.virginia.gov). Any future site activities involving excavation or disturbance of formerly petroleum contaminated soils and or groundwater must be reported to DEQ, as authorized by Code of Virginia 62.1-44.34.8 through 19 and 9VAC25-580-10 *et seq.*

8. Floodplain. As applicable, the federal agency should ensure compliance with applicable floodplain requirements. To find community NFIP participation and local floodplain administrator contact information, use DCR's Local Floodplain Management Directory: www.dcr.virginia.gov/dam-safety-and-floodplains/floodplain-directory.

9. Point Source Water Pollution. Coordinate with DEQ NRO (Rebecca Johnson at rebecca.johnson@deq.virginia.gov) for coverage under the VAG83 permit as necessary.

Thank you for the opportunity to comment on this EA and FCD. The detailed comments of reviewers are attached. If you have questions, please feel free to contact me or Julia Wellman at (804) 774-8237.

Sincerely,



Bettina Rayfield, Manager
Environmental Impact Review and Long Range Priorities Program
Virginia Department of Environmental Quality
(804) 659-1915
Bettina.Rayfield@deq.virginia.gov
Central Office
1111 E. Main St., Suite 1400
Richmond, VA 23219
(804) 698-4000

cc: Lee Brann, DWR
Allison Tillett, DCR
Arlene Warren, VDH
Roger Kirchen, DHR
Allison Wishon, VDOT
Roger Lazaro, Northern Virginia Regional Commission
Mark Schwartz, Arlington County

Appendix D

Biological Resources Coordination



United States Department of the Interior

U.S. Fish & Wildlife Service
Chesapeake Bay Field Office
177 Admiral Cochrane Drive
Annapolis, MD 21401
410/573 4575



Online Certification Letter

Today's date

Project

Dear Applicant for online certification:

Thank you for using the U.S. Fish and Wildlife Service (Service) Chesapeake Bay Field Office online project review process. By printing this letter in conjunction with your project review package, you are certifying that you have completed the online project review process for the referenced project in accordance with all instructions provided, using the best available information to reach your conclusions. This letter, and the enclosed project review package, completes the review of your project in accordance with the Endangered Species Act of 1973 (16 U.S.C. 1531-1544, 87 Stat. 884), as amended (ESA). This letter also provides information for your project review under the National Environmental Policy Act of 1969 (P.L. 91-190, 42 U.S.C. 4321-4347, 83 Stat. 852), as amended. A copy of this letter and the project review package must be submitted to this office for this certification to be valid. This letter and the project review package will be maintained in our records.

Based on this information and in accordance with section 7 of the Endangered Species Act (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.), we certify that except for occasional transient individuals, no federally listed endangered or threatened species are known to exist within the project area. Therefore, no Biological Assessment or further section 7 consultation with the U.S. Fish and Wildlife Service is required. Should project plans change, or if additional information on the distribution of listed or proposed species becomes available, this determination may be reconsidered.

This response relates only to federally protected threatened or endangered species under our jurisdiction. For additional information on threatened or endangered species in Maryland, you should contact the Maryland Wildlife and Heritage Division at (410) 260-8573. For information in Delaware you should contact the Delaware Division of Fish and Wildlife, Wildlife Species Conservation and Research Program at (302) 735-8658. For information in the District of Columbia, you should contact the National Park Service at (202) 339-8309.

The U.S. Fish and Wildlife Service also works with other Federal agencies and states to minimize loss of wetlands, reduce impacts to fish and migratory birds, including bald eagles, and restore habitat for wildlife. Information on these conservation issues and how development projects can avoid affecting these resources can be found on our website (www.fws.gov/chesapeakebay)

We appreciate the opportunity to provide information relative to fish and wildlife issues, and thank you for your interest in these resources. If you have any questions or need further assistance, please contact Chesapeake Bay Field Office Threatened and Endangered Species program at (410) 573-4527.

Sincerely,

Genevieve LaRouche
Field Supervisor



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694 Fax: (804) 693-9032



In Reply Refer To:

November 09, 2023

Project Code: 2024-0014985

Project Name: 9/11 Pentagon Memorial Visitor Education Center

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf>

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see <https://www.fws.gov/program/migratory-bird-permit/what-we-do>.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see <https://www.fws.gov/library/collections/threats-birds>.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit <https://www.fws.gov/partner/council-conservation-migratory-birds>.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Project Code in the header of this

letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office

6669 Short Lane

Gloucester, VA 23061-4410

(804) 693-6694

PROJECT SUMMARY

Project Code: 2024-0014985

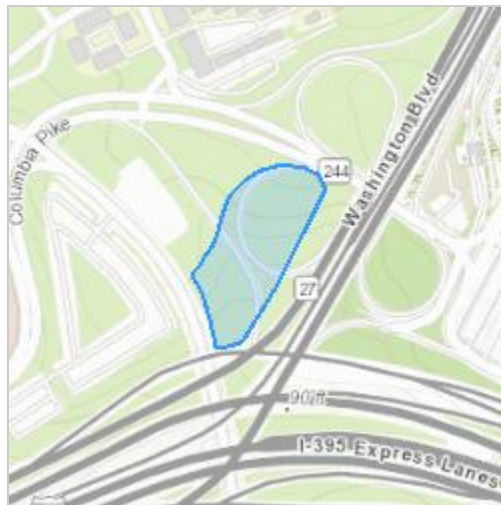
Project Name: 9/11 Pentagon Memorial Visitor Education Center

Project Type: Recreation - New Construction

Project Description: The purpose of the Proposed Action is to construct and operate a VEC to support visitors of the 9/11 Pentagon Memorial. In addition to various facilities, the proposed VEC will provide interactive exhibits and educational programs that will give visitors a sense of the broad impact of the tragedy from a variety of perspectives. Stories of the courage and resilient spirit demonstrated by Pentagon employees, first responders, and residents of the area will be shared throughout the exhibits.

Project Location:

The approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@38.8690173,-77.06265462549976,14z>



Counties: Arlington County, Virginia

ENDANGERED SPECIES ACT SPECIES

There is a total of 1 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries¹, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

-
1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

INSECTS

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the [National Wildlife Refuge](#) system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act¹ and the Migratory Bird Treaty Act².

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats³, should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

-
1. The [Bald and Golden Eagle Protection Act](#) of 1940.
 2. The [Migratory Birds Treaty Act](#) of 1918.
 3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are bald and/or golden eagles in your project area.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read the supplemental information and specifically the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)

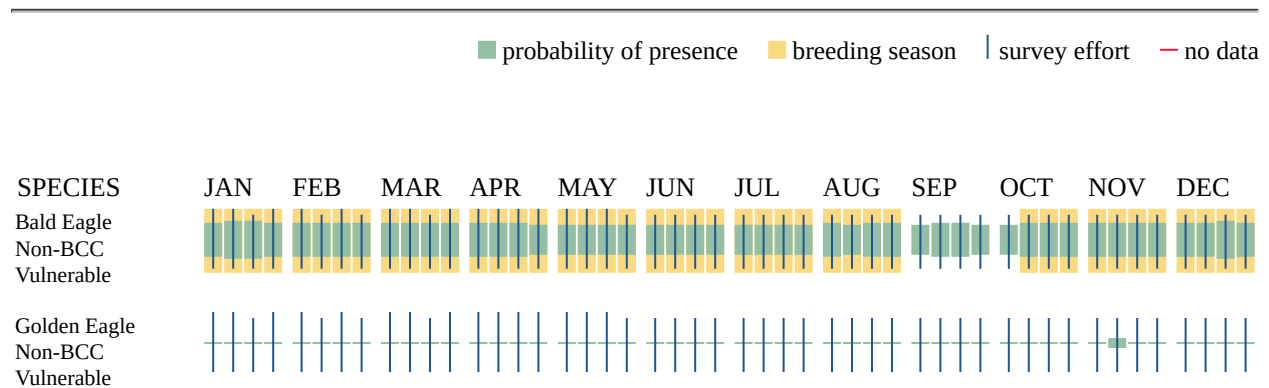
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)

Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (—)

A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incident-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act¹ and the Bald and Golden Eagle Protection Act².

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats³ should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

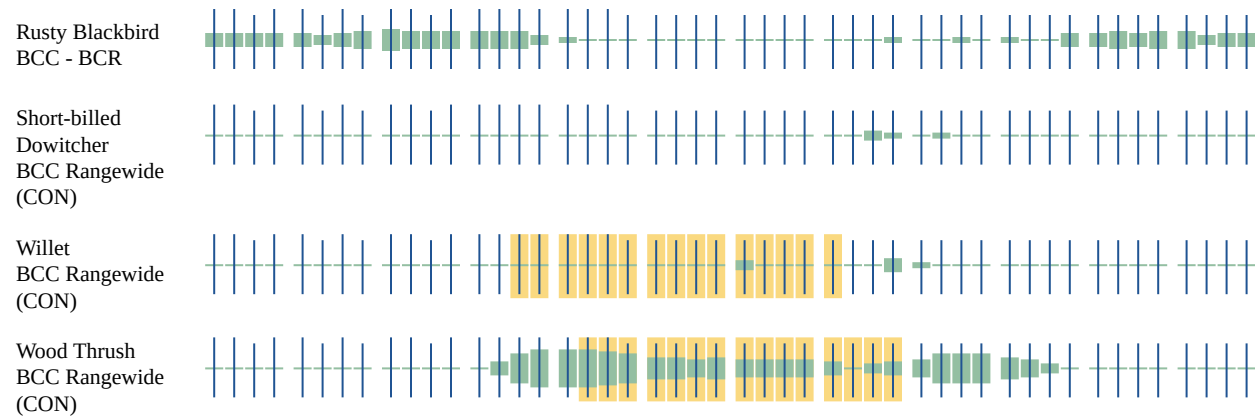
1. The [Migratory Birds Treaty Act](#) of 1918.
2. The [Bald and Golden Eagle Protection Act](#) of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle <i>Haliaeetus leucocephalus</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Oct 15 to Aug 31
Black-billed Cuckoo <i>Coccyzus erythrophthalmus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9399	Breeds May 15 to Oct 10
Blue-winged Warbler <i>Vermivora pinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9509	Breeds May 1 to Jun 30
Bobolink <i>Dolichonyx oryzivorus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9454	Breeds May 20 to Jul 31
Canada Warbler <i>Cardellina canadensis</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9643	Breeds May 20 to Aug 10
Cerulean Warbler <i>Dendroica cerulea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/2974	Breeds Apr 29 to Jul 20
Chimney Swift <i>Chaetura pelagica</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will <i>Antrostomus vociferus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10678	Breeds May 1 to Aug 20
Golden Eagle <i>Aquila chrysaetos</i> This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds elsewhere

NAME	BREEDING SEASON
Kentucky Warbler <i>Oporornis formosus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9443	Breeds Apr 20 to Aug 20
King Rail <i>Rallus elegans</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8936	Breeds May 1 to Sep 5
Lesser Yellowlegs <i>Tringa flavipes</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Pectoral Sandpiper <i>Calidris melanotos</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9561	Breeds elsewhere
Prairie Warbler <i>Dendroica discolor</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9513	Breeds May 1 to Jul 31
Prothonotary Warbler <i>Protonotaria citrea</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker <i>Melanerpes erythrocephalus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Ruddy Turnstone <i>Arenaria interpres morinella</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/10633	Breeds elsewhere
Rusty Blackbird <i>Euphagus carolinus</i> This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere
Short-billed Dowitcher <i>Limnodromus griseus</i> This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9480	Breeds elsewhere





Additional information can be found using the following links:

- Eagle Management <https://www.fws.gov/program/eagle-management>
- Measures for avoiding and minimizing impacts to birds <https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds>
- Nationwide conservation measures for birds <https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf>
- Supplemental Information for Migratory Birds and Eagles in IPaC <https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action>

IPAC USER CONTACT INFORMATION

Agency: Army
Name: Rhiannon Flickinger
Address: 40 Wight Ave
City: Hunt Valley
State: MD
Zip: 21030
Email: rflickinger@jmt.com
Phone: 4105682694

LEAD AGENCY CONTACT INFORMATION

Lead Agency: Army

Known or likely to occur within a **5 mile radius around point 38.8692100 -77.0621197**
in **013 Arlington County, 059 Fairfax County, 510 Alexandria City, 610 Falls Church City, VA**

[View Map of
Site Location](#)

748 Known or Likely Species ordered by Status Concern for Conservation
(displaying first 33) (33 species with Status* or Tier I** or Tier II**)

BOVA Code	Status*	Tier**	Common Name	Scientific Name
050022	FEST	Ia	Bat, northern long-eared	Myotis septentrionalis
010032	FESE	Ib	Sturgeon, Atlantic	Acipenser oxyrinchus
060029	FTST	IIa	Lance, yellow	Elliptio lanceolata
050020	SE	Ia	Bat, little brown	Myotis lucifugus
050027	FPSE	Ia	Bat, tri-colored	Perimyotis subflavus
060006	SE	Ib	Floater, brook	Alasmodonta varicosa
030062	ST	Ia	Turtle, wood	Glyptemys insculpta
040096	ST	Ia	Falcon, peregrine	Falco peregrinus
040293	ST	Ia	Shrike, loggerhead	Lanius ludovicianus
040379	ST	Ia	Sparrow, Henslow's	Centronyx henslowii
100155	ST	Ia	Skipper, Appalachian grizzled	Pyrgus wyandot
040292	ST		Shrike, migrant loggerhead	Lanius ludovicianus migrans
100079	FC	IIIa	Butterfly, monarch	Danaus plexippus
030063	CC	IIIa	Turtle, spotted	Clemmys guttata
030012	CC	IVa	Rattlesnake, timber	Crotalus horridus
010077		Ia	Shiner, bridle	Notropis bifrenatus
040040		Ia	Ibis, glossy	Plegadis falcinellus
040306		Ia	Warbler, golden-winged	Vermivora chrysoptera
100248		Ia	Fritillary, regal	Speyeria idalia idalia
040213		Ic	Owl, northern saw-whet	Aegolius acadicus
040052		IIa	Duck, American black	Anas rubripes
040033		IIa	Egret, snowy	Egretta thula
040029		IIa	Heron, little blue	Egretta caerulea caerulea
040036		IIa	Night-heron, yellow-crowned	Nyctanassa violacea violacea
040181		IIa	Tern, common	Sterna hirundo
040320		IIa	Warbler, cerulean	Setophaga cerulea
040140		IIa	Woodcock, American	Scolopax minor
060071		IIa	Lampmussel, yellow	Lampsilis cariosa
040203		IIb	Cuckoo, black-billed	Coccyzus erythrophthalmus
040105		IIb	Rail, king	Rallus elegans

040304		IIC	Warbler, Swainson's	Limnothlypis swainsonii
070020		IIC	Amphipod, Pizzini's	Stygobromus pizzinii
100154		IIC	Butterfly, Persius duskywing	Erynnis persius persius

To view **All 748 species** [View 748](#)

*FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; ST=State Threatened; FP=Federal Proposed;
FC=Federal Candidate; CC=Collection Concern

**I=VA Wildlife Action Plan - Tier I - Critical Conservation Need; II=VA Wildlife Action Plan - Tier II - Very High Conservation Need;
III=VA Wildlife Action Plan - Tier III - High Conservation Need; IV=VA Wildlife Action Plan - Tier IV - Moderate Conservation Need
Virginia Wildlife Action Plan Conservation Opportunity Ranking:

a - On the ground management strategies/actions exist and can be feasibly implemented.;

b - On the ground actions or research needs have been identified but cannot feasibly be implemented at this time.;

c - No on the ground actions or research needs have been identified or all identified conservation opportunities have been exhausted.

Anadromous Fish Use Streams (3 records)

[View Map of All
Anadromous Fish Use Streams](#)

Stream ID	Stream Name	Reach Status	Anadromous Fish Species			View Map
			Different Species	Highest TE *	Highest Tier **	
C25	Fourmile run	Confirmed	2			Yes
C64	Potomac river	Confirmed	6		IV	Yes
P42	Cameron run	Potential	0			Yes

Impediments to Fish Passage (1 records)

[View Map of All
Fish Impediments](#)

ID	Name	River	View Map
1155	BARCROFT DAM	HOLMES RUN	Yes

Threatened and Endangered Waters

N/A

Managed Trout Streams

N/A

Bald Eagle Concentration Areas and Roosts

N/A

Bald Eagle Nests (1 records)

[View Map of All Query Results
Bald Eagle Nests](#)

Nest	N Obs	Latest Date	DGIF Nest Status	View Map

AR0801	3	Apr 9 2008	Unknown	Yes
------------------------	---	------------	---------	---------------------

Displayed 1 Bald Eagle Nests

Habitat Predicted for Aquatic WAP Tier I & II Species (1 Reach)

[View Map Combined Reaches from Below of Habitat Predicted for WAP Tier I & II Aquatic Species](#)

Stream Name	Tier Species						View Map
	Highest TE [*]	BOVA Code, Status [*] , Tier ^{**} , Common & Scientific Name					
Holmes Run (20700102)		010077		Ia	Shiner, bridge	Notropis bifrenatus	Yes

Habitat Predicted for Terrestrial WAP Tier I & II Species (2 Species)

[View Map of Combined Terrestrial Habitat Predicted for 2 WAP Tier I & II Species Listed Below](#)

ordered by Status Concern for Conservation

BOVA Code	Status [*]	Tier ^{**}	Common Name	Scientific Name	View Map
040105		Iib	Rail, king	Rallus elegans	Yes
040038			Bittern, American	Botaurus lentiginosus	Yes

Virginia Breeding Bird Atlas Blocks (10 records)

[View Map of All Query Results](#)
[Virginia Breeding Bird Atlas Blocks](#)

BBA ID	Atlas Quadrangle Block Name	Breeding Bird Atlas Species			View Map
		Different Species	Highest TE [*]	Highest Tier ^{**}	
54194	Alexandria, CE	49		II	Yes
54193	Alexandria, CW	27		IV	Yes
54192	Alexandria, NE	32		II	Yes
54191	Alexandria, NW	58		III	Yes
53194	Annandale, CE	49		III	Yes
53192	Annandale, NE	49		II	Yes
53204	Falls Church, CE	54		III	Yes
53206	Falls Church, SE	60		III	Yes
54203	Washington West, CW	28		III	Yes
54205	Washington West, SW	65		III	Yes

Public Holdings: (6 names)

Name	Agency	Level
Arlington House National Historical Site	National Park Service	Federal
George Washington Memorial National Parkway	National Park Service	Federal
Arlington National Cemetery	U.S. Dept. of Army	Federal
Cameron Station Military Reservation	U.S. Dept. of Army	Federal

Fort Myer Military Reservation	U.S. Dept. of Army	Federal
The Pentagon	U.S. Dept. of Army	Federal

Summary of BOVA Species Associated with Cities and Counties of the Commonwealth of Virginia:

FIPS Code	City and County Name	Different Species	Highest TE	Highest Tier
013	Arlington	458	FESE	I
059	Fairfax	559	FESE	I
510	Alexandria City	475	FESE	I
610	Falls Church City	440	FESE	I

USGS 7.5' Quadrangles:

Annandale
Falls Church
Alexandria
Washington West

USGS NRCS Watersheds in Virginia:

N/A

USGS National 6th Order Watersheds Summary of Wildlife Action Plan Tier I, II, III, and IV Species:

HU6 Code	USGS 6th Order Hydrologic Unit	Different Species	Highest TE	Highest Tier
PL24	Potomac River-Pimmit Run	68	FCSE	I
PL25	Potomac River-Fourmile Run	67	FCST	I
PL26	Cameron Run	69	ST	I
PL28	Potomac River-Little Hunting Creek	71	ST	I

Appendix E

Visual Impact Assessment

March 2023
Updated October 2023

Visual Impact Assessment

Pentagon Memorial Fund Visitor Education Center



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Introduction

The Pentagon Memorial Fund (PMF) is proposing to construct a Visitor Education Center (VEC) on land owned by Arlington National Cemetery (ANC). The proposed site falls entirely within the Southern Expansion site that was first proposed in 2016 to accommodate the increasing requirements for interment space at the cemetery. The VEC site involves the use of approximately 3.71 acres and is currently bound by the existing Air Force Memorial to the west, Columbia Pike, Joyce Avenue and Interstate 395 on the south (Figure 1).

This document describes the methodology used to develop the Area of Potential Effect (APE), the resources that were identified within the APE, the visibility between the existing resources and the proposed VEC, and the impact of the proposed VEC on the identified historic resources.

The project location is within the area studied for the Southern Expansion of Arlington National Cemetery (ANC) therefore, the *Viewshed Study and Impact Assessment*¹ completed to support that undertaking was used as a reference. Other guidance that contributed to the development of this document includes the ANC *Integrated Cultural Resources Management Plan* (ICRMP) and the Programmatic Agreement (PA) between ANC, Virginia State Historic Preservation Officer (VDHR), and the Advisory Council on Historic Preservation (ACHP) dated 2014. Information for the specific historic resources identified as potentially effected was gathered from Virginia Cultural Resource Inventory System (VCRIS) as well as Washington DC Planning websites.

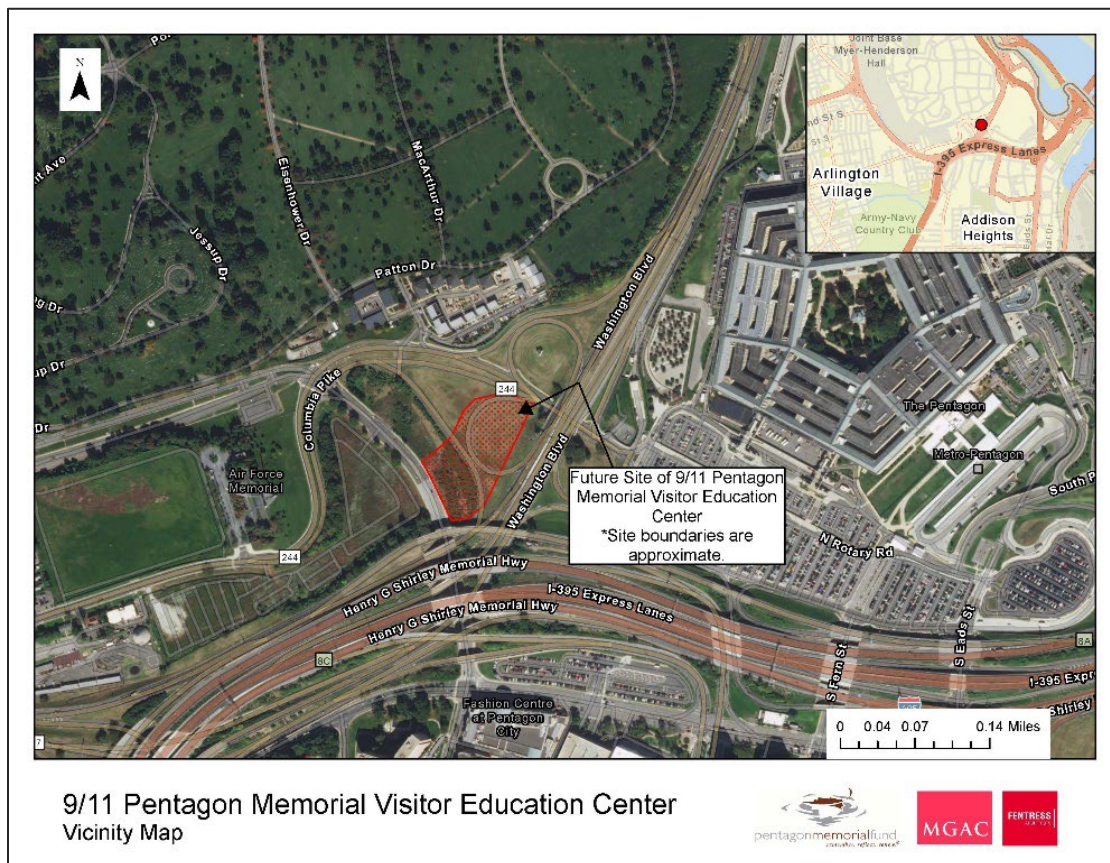


Figure 1: Project location map for the Pentagon Memorial Visitor Education Center

¹ Wanner, "Arlington National Cemetery Southern Expansion Site – Viewshed Study and Impact Assessment."

Study Purpose

The Pentagon Memorial Fund (PMF) is proposing to construct a Visitor Education Center (VEC) on land owned by Arlington National Cemetery (ANC).

In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended) (NHPA), the potential direct and indirect effects on historic resources must be evaluated.

As defined by 36CFR800.16(d), an APE 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. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking". The APE identifies all historic properties within a radius of the project location. This APE not only considers potential direct effects on resources, but also indirect effects such as impacts to viewsheds and vistas.

Additionally, this report identifies all resources within the APE that are listed in or are eligible for listing in the National Register of Historic Places (NRHP) and therefore have the potential to be impacted by the construction of the VEC. JMT completed on-site documentation with digital photography on February 22, 2023, and March 9, 2023. The result of the digital photography provided insight that allowed JMT to assess the potential visual impacts of the proposed VEC on the historic resources.

The information gathered in this report will support the findings of the EA as well as the completion of the Section 106 process, which will fully evaluate potential effects of the proposed undertaking on surrounding resources in accordance with the NHPA of 1966 as amended.

Proposed Action

PMF proposes to construct and operate a VEC that will support visitors of the 9/11 Pentagon Memorial. ANC will provide a license to the PMF to permit use of the land owned by ANC (Figure 1).

The proposed VEC would include exhibits and programs to engage visitors and educate them as to the effects and broad impact of the tragedy from a variety of perspectives. While a memorial exists that honors the 184 lives that were lost as a result of the attack on the Pentagon, there is no Visitor Education Center that provides an understanding of the events of that day, the lives lost, and the historic significance of the 9/11 Pentagon Memorial Site. The proposed VEC would provide details of the 184 individuals who lost their lives on 9/11, interpretive displays discussing the symbolism of the memorial design, permanent restrooms, shelter for visitors, a café, bookstore, and conference space.

The proposed VEC would occupy approximately 3.71 acres adjacent to the Southern Expansion of ANC. After reconfiguration of these roadways resulting from the Federal Highway Administration's Defense Access Roadway project, the VEC would be bounded by Columbia Pike, East Joyce Street, and Washington Boulevard. In accordance with the NHPA, ANC is initiating the Section 106 process to receive concurrence on the Area of Potential Effect (APE) and proposed consulting parties to be included in the process.

The proposed undertaking would include the construction of a new building with an approximate absolute elevation of 95-feet at the highest point at the southeast corner of the building, which includes the rooftop mechanical enclosure. The absolute elevation of the remaining building will be 81-feet to the top of the parapet. At this time, the exact siting of the facility on the parcel has yet to be finalized, however, the building is anticipated to be constructed at the northern end of the site with a building footprint ranging from 25,000 to 30,000 square feet. Up to 100 parking spaces are anticipated and would be located to the south of the building. An entrance on South Joyce Street will serve as the access point for cars, buses, and service vehicles (Figure 2).

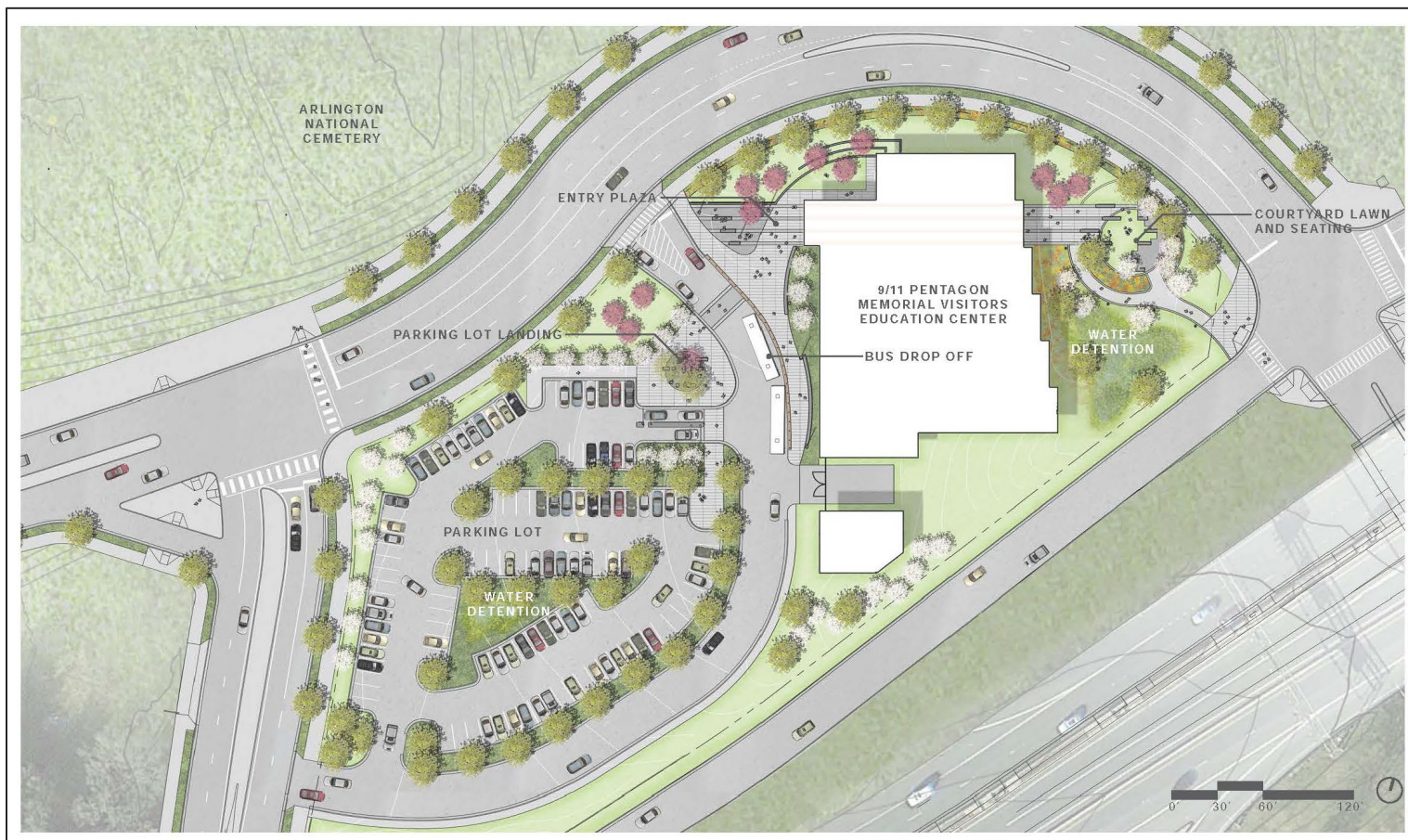


Figure 2: Proposed site plan as of March 2023 (Source: Fentress Architects)

Methodology

The APE was developed using a combination of findings from the 2016 *Viewshed Study and Impact Assessment* completed by EAC/A, Inc., ArcGIS (to create an initial Digital Elevation Model (DEM)), Google Earth Pro to evaluate line-of-sight to and from the project location, and on-site survey. The APE was established to encompass all areas with the potential to be directly or indirectly affected by the proposed undertaking.

DIGITAL ELEVATION MODEL (DEM)

The DEM is a projection that gathers information about the topographic surroundings of the project location. DEMs can be derived from topographic maps as well as high resolution Light Detection and Ranging (LiDAR) data. JMT developed the DEM using 2-foot contour data as the LiDAR data for Arlington County was not publicly accessible. The gathered contour data was transformed with ArcGIS Pro using the spatial analyst tool. With the DEM developed, JMT then utilized the ArcGIS Pro Viewshed spatial analyst tool after a focal point, generally in the center of the proposed VEC site, was identified and included the proposed 95-feet and 81-feet top heights of the building.

According to the United States Geological Survey (USGS) website, a DEM “represents the bare ground topographic surface of the earth excluding trees, buildings, and any other surface objects.” These omissions therefore result in the capture of a larger viewshed than what would be visible in reality. The result of this DEM projected visibility of the proposed site reaching as far as approximately three miles (Figure 3). Similarly, the DEM for the Southern Expansion returned a viewshed which included resources as far away as four miles.

Given this information and the findings of both the VEC and Southern Expansion DEMs, it was determined that further evaluation and refinement was required to determine the distance from which the VEC will be seen from nearby resources and vice versa.

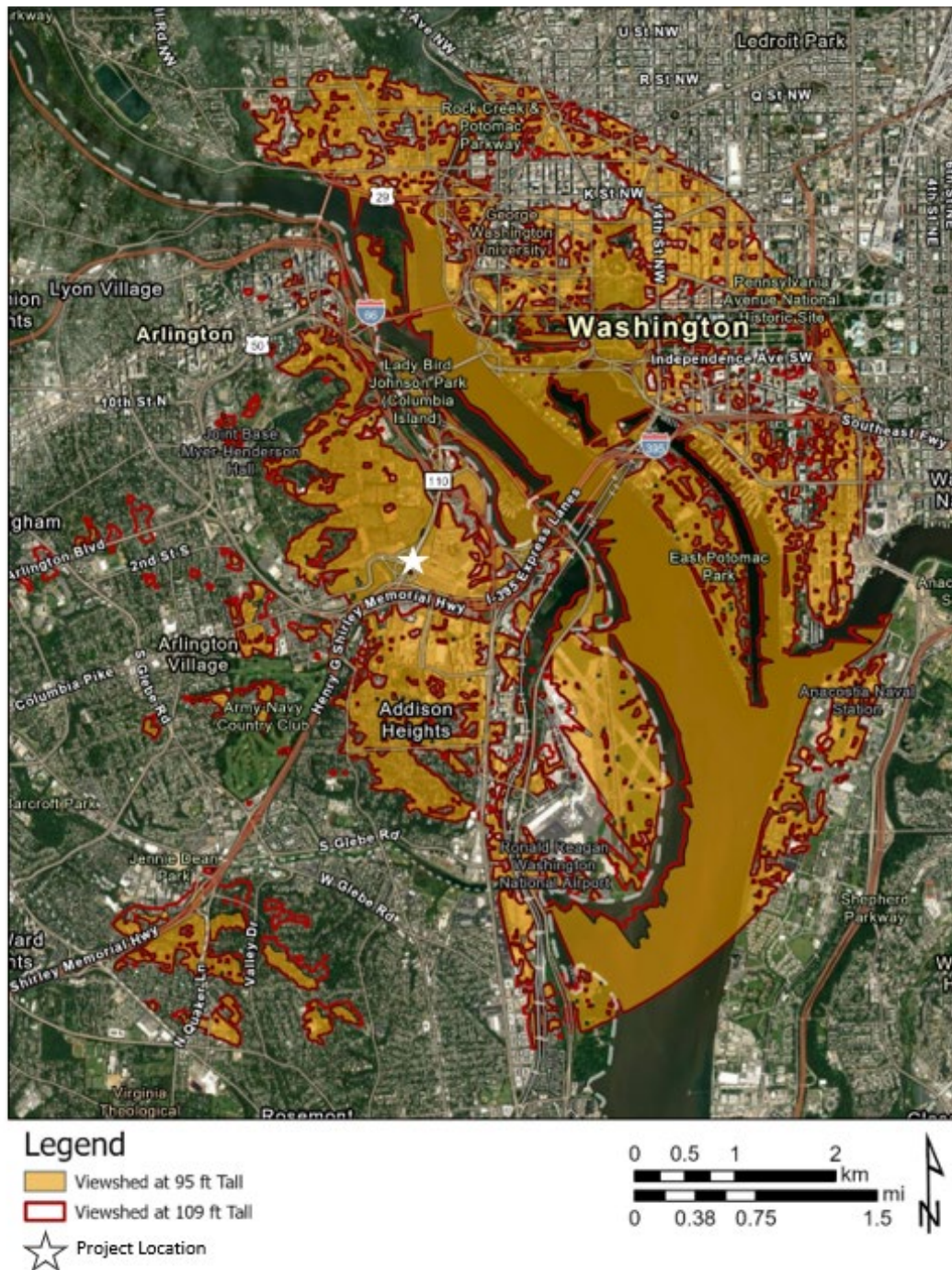


Figure 3: Digital Elevation Model (DEM) showing potential visibility from proposed VEC location.

LINE-OF-SIGHT ASSESSMENTS

To further refine the viewshed and therefore the APE, line-of-sight assessments were developed using vantage points identified through the DEM. The Southern Expansion *Viewshed Study and Impact Assessment* similarly addressed DEM inaccuracies with line-of-sight projections. Given that the proposed VEC site falls within the high point of the area assessed for the Southern Expansion, it is likely the line-of-sight projections would be similar.

When the omitted flora and built environment were considered in concert with the DEMs, lines-of-sight would frequently be impacted, ultimately decreasing the distance from which potential effects needed to be considered. The dense development of buildings and infrastructure throughout downtown Washington and surrounding neighborhoods, and Arlington, Virginia, blocks visibility of the proposed VEC site. The areas to the north, west, and south of Arlington National Cemetery are characterized by an extensive infrastructure system including raised roadways and dense building development of varying heights. Additionally, the mature landscaping that characterizes the cemetery further obscures lines-of-sight to and from the VEC site and historic resources.

The most significant factor that will affect the lines-of-sight to and from the VEC is the relatively low elevation of the proposed building. The preferred alternative for the undertaking involves the construction of the VEC at the lowest point within the proposed boundaries of the site. These circumstances will lessen potential visibility and impact of the two-story building from historic resources, thereby minimizing effects.

JMT assessed line-of-sight visibility using the elevation profile tool in Google Earth Pro supported by on-site photography. This tool provides a visual interpretation of the elevation changes between two points. If there is a point between the two locations with a higher elevation, the line-of-sight will be obscured. Figure 4 - Figure 9 are examples of elevation profiles from various locations identified in the DEM projection. Photograph 1 - Photograph 4 supplement the elevation profiles.

While the DEM projected the project would be visible well beyond a mile of the project site, JMT assessed that the line-of-sight between the proposed VEC and various points throughout Washington, DC and Arlington, VA were blocked from view based on the presence of visual obstructions. As a result, it was determined that many historic resources would not have visibility of the VEC site therefore, JMT was able to further shrink the viewshed.

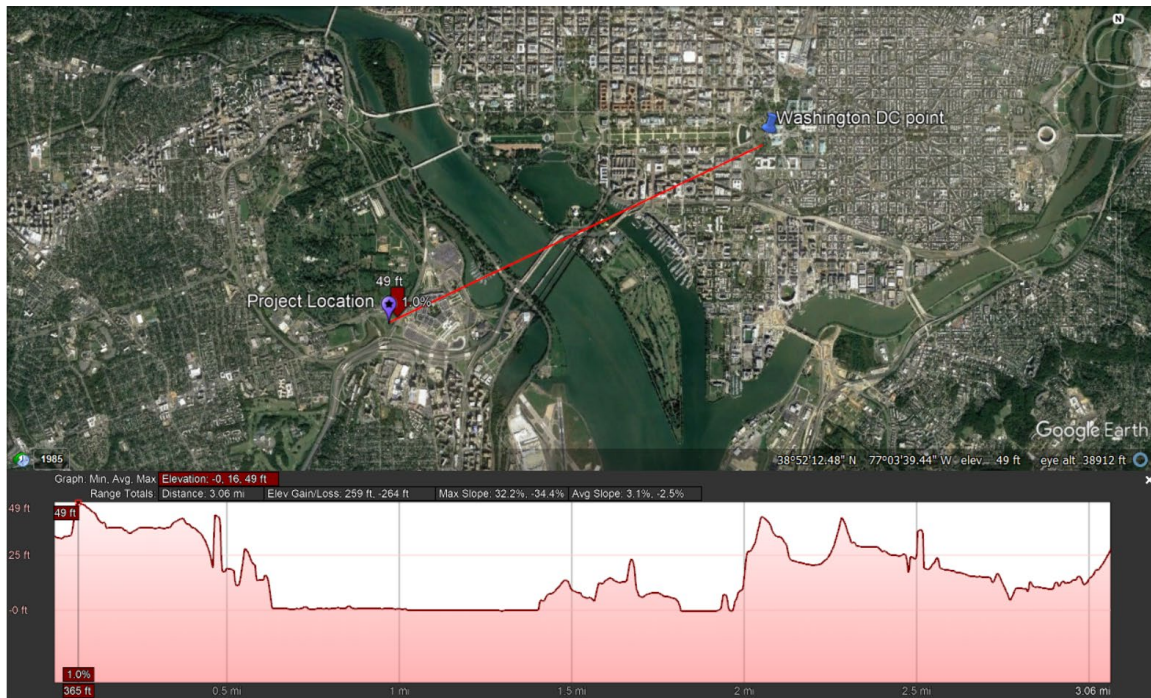


Figure 4: Elevation profile from the proposed site of the VEC to one of the furthest points identified in the DEM near the US Capitol. Note a location approximately 365 feet from the VEC has a higher elevation (49-feet) than the VEC and terminus point, blocking the line-of-sight.

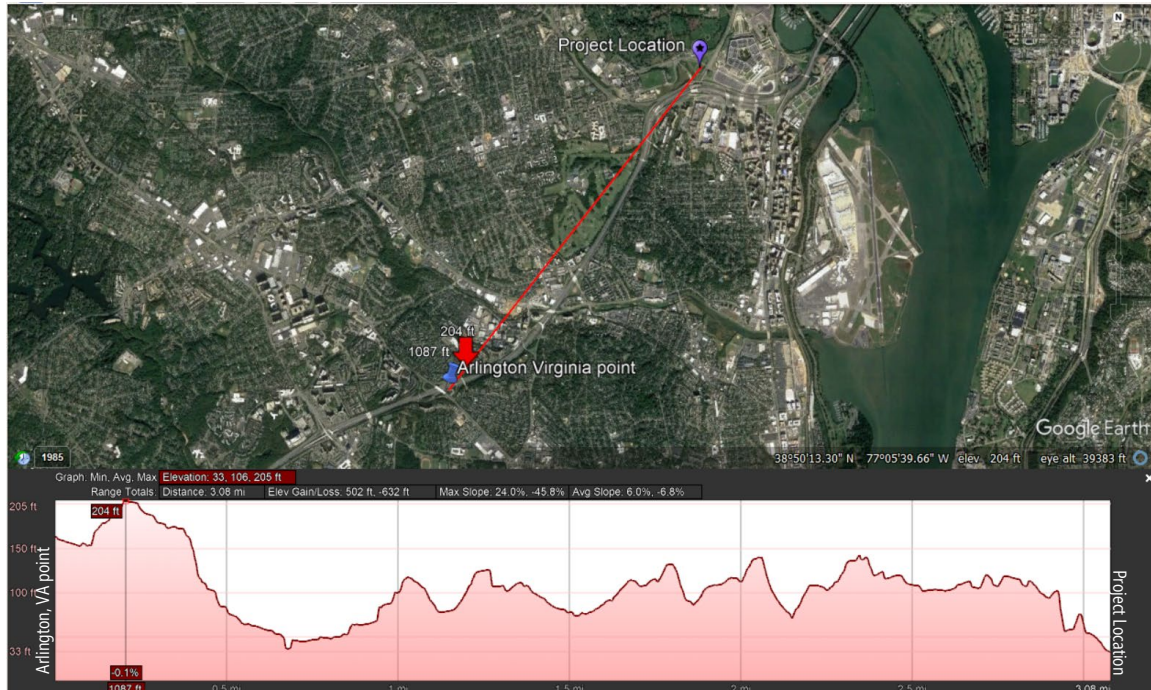


Figure 5: Elevation profile from one of the furthest points identified in the DEM in Arlington, VA near where King Street (Route 7) passes over 395, to the proposed VEC site. Note a location approximately 0.2-mile from the Arlington point has a higher elevation (204-feet) than the starting point and VEC, blocking the line-of-sight.

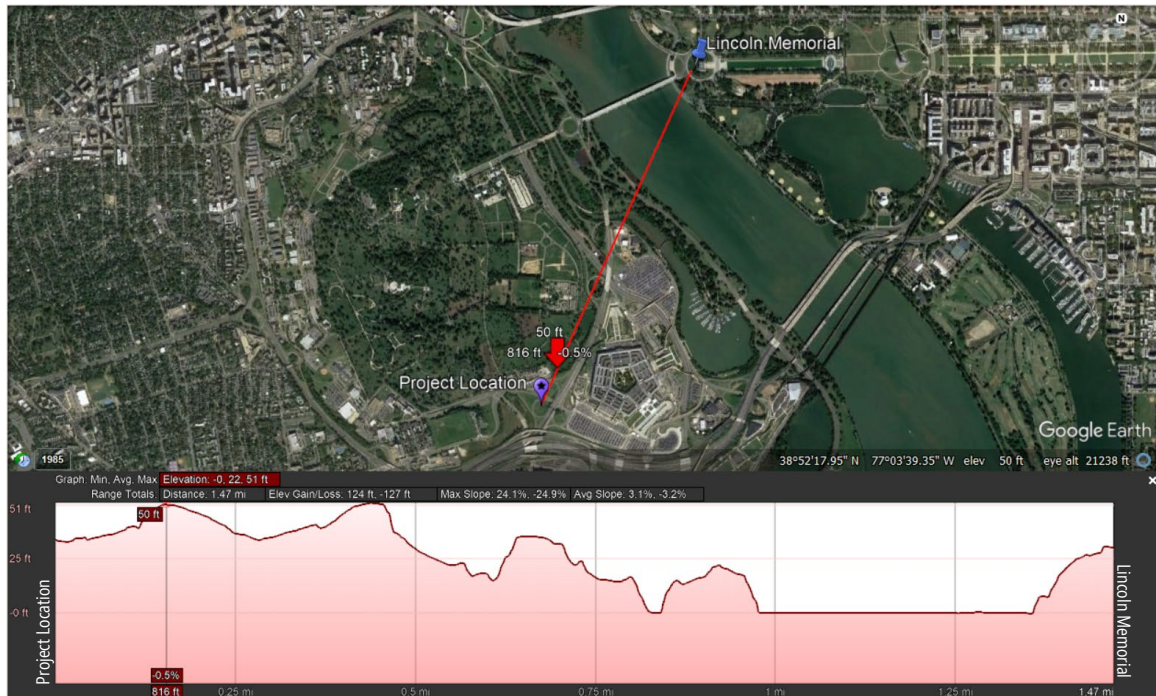


Figure 6: Elevation profile from the proposed site of the VEC to the Lincoln Memorial. The line-of-sight is interrupted approximately 816-feet from the proposed VEC site by a point with a 50-foot elevation.



Photograph 1: View from the rear of the Lincoln Memorial towards proposed VEC location; looking south-southwest.

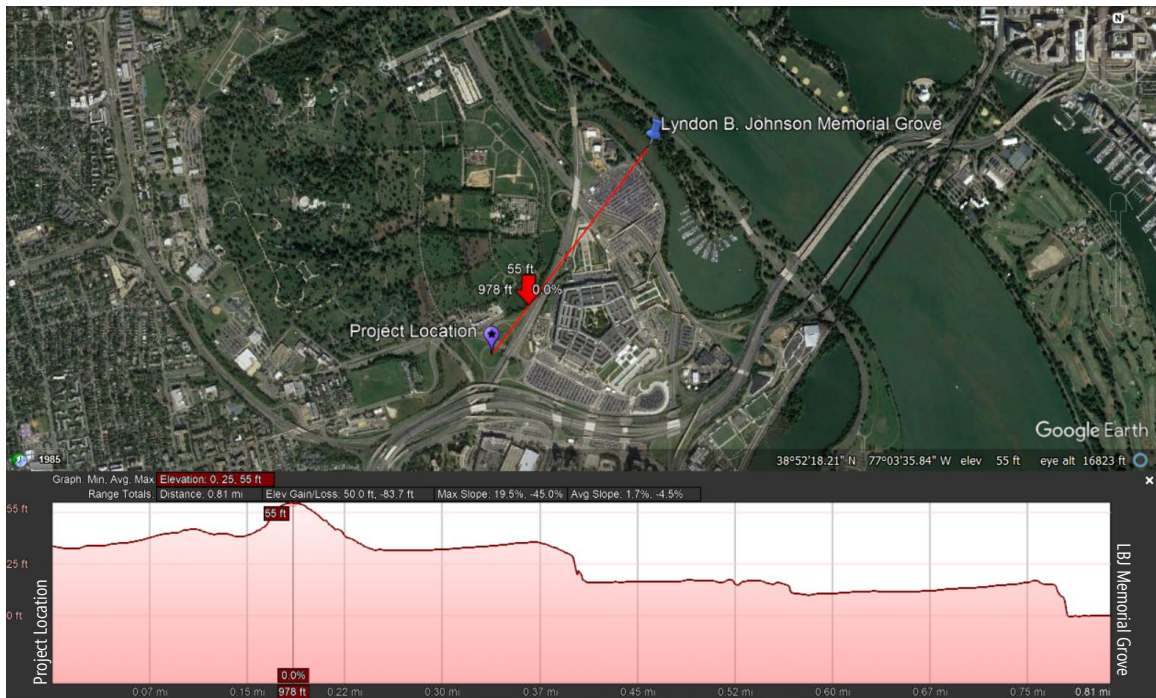


Figure 7: Elevation profile from the proposed site of the VEC to the Lyndon B. Johnson (LBJ) Memorial Grove. The line of site is interrupted approximately 978-feet from the proposed VEC site by a point with a 55-foot elevation.



Photograph 2: View from the LBJ Memorial Grove towards proposed VEC location; looking southwest.

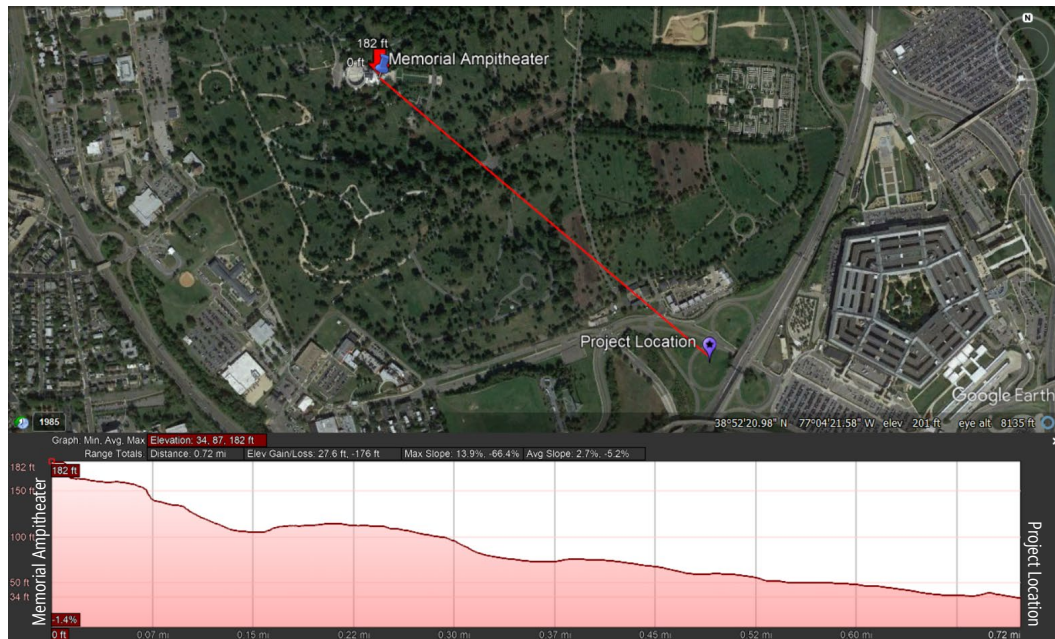


Figure 8: Elevation profile from the Memorial Amphitheater to the VEC. Although the line appears uninterrupted, the line-of-sight is likely interrupted by mature trees and buildings near the proposed VEC site.



Photograph 3: View from the Memorial Amphitheater towards the proposed VEC location; looking southeast.

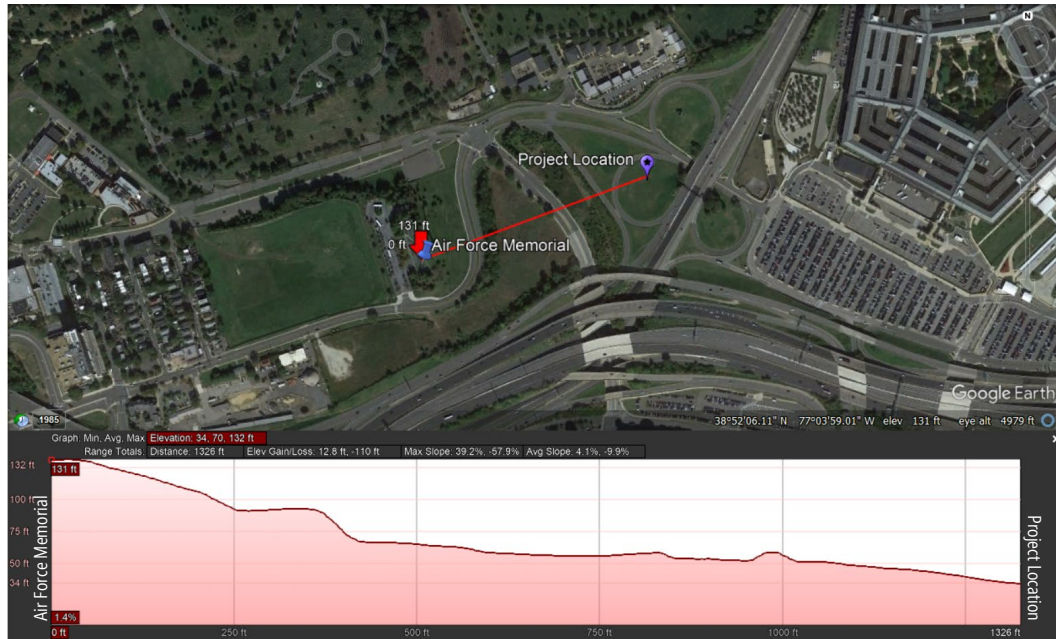


Figure 9: Elevation profile from the Air Force Memorial to the VEC. The line of sight appears interrupted.



Photograph 4: View from the Air Force Memorial towards the proposed VEC location; looking east.

FINAL APE

JMT refined the APE by analyzing the DEM, elevation models, and supporting photography in combination with the proposed scale of the VEC, surrounding built environment, and foliage. As a result, JMT determined that a visual APE of 0.25-mile is sufficient to capture the potential visual effects of the proposed undertaking. This APE includes all areas in which the proposed VEC may introduce visual elements that diminish or alter the setting, including the landscape, of extant historic resources.

Potential temporary impacts to the resources within the APE include haul routes, construction noise, and dust. The effects of these impacts will be mitigated by the presence of Washington Boulevard, Columbia Pike, and the Arlington National Cemetery service complex. Once construction is complete, impacts from maintenance activities and events at the site will be similar in nature to the Air Force Memorial and the Cemetery.

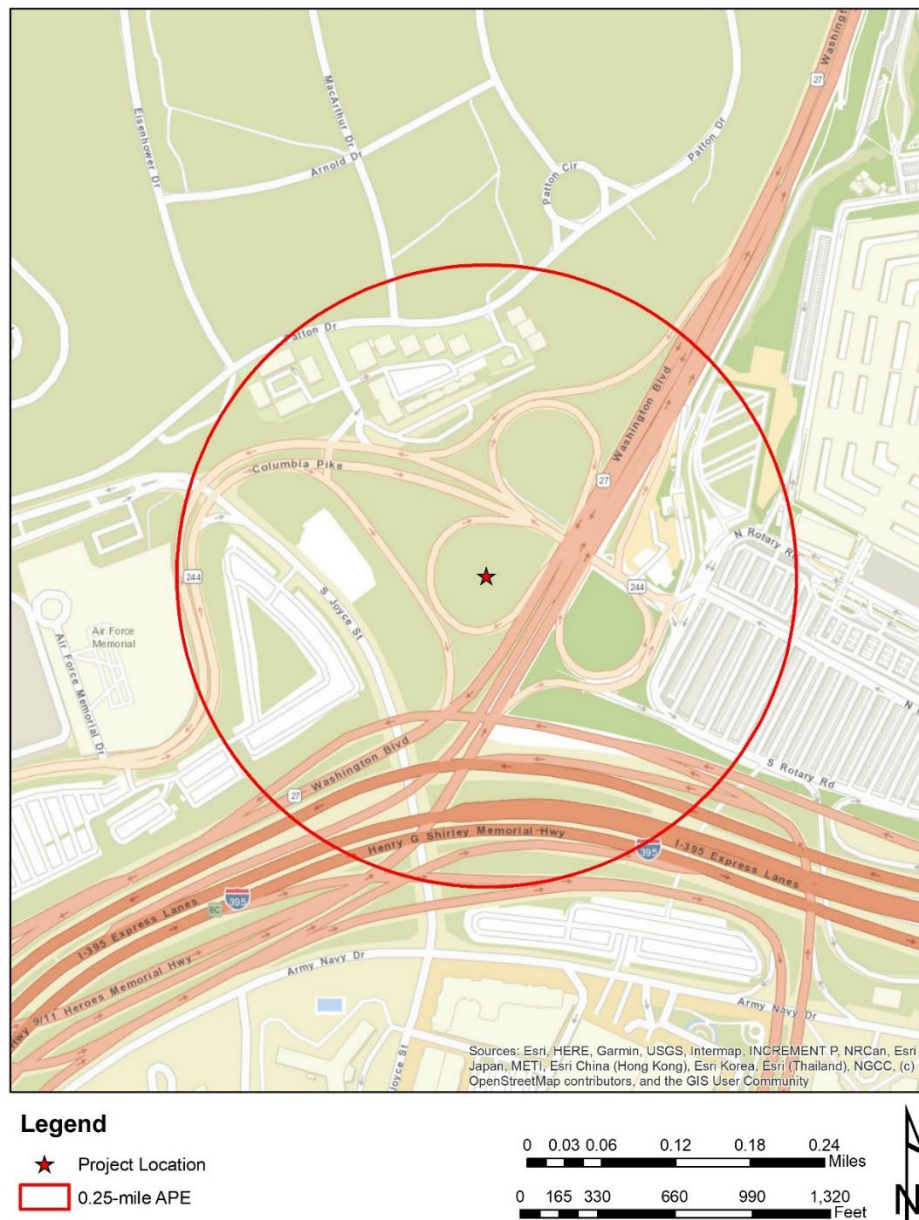


Figure 10: APE map.

Fieldwork Findings

Using VCRIS and the ANC ICRMP, JMT gathered information about historic resources that fall within the final visual APE (Figure 12, Figure 14, and Figure 14). According to VCRIS, there are three previously identified resources eligible for or listed in the National Register of Historic Places within the 0.25-mile APE: the Pentagon Office Building Complex, the Air Force Memorial, and Arlington National Cemetery (Table 1). Additionally, there is one ANC contributing view/vista, per ANC ICRMP, with the potential to be affected by the VEC, the view towards Air Force Memorial (Table 2). No resources that contribute to Arlington National Cemetery are located within the APE².

The following pages demonstrate the view to and from the proposed VEC site to the extant historic resources within the APE.

Table 1: Previously identified historic resources within the visual APE according to VCRIS.

RESOURCE ID NUMBERS	RESOURCE NAME	ELIGIBILITY	PHOTOGRAPHS
000-0072	Pentagon Office Building Complex	Listed	5-6
000-9821	Air Force Memorial	Potentially Eligible	7-8
000-0042	Arlington National Cemetery	Listed	3, 9-10

² Three non-contributing resources are within the APE however were not evaluated for this report.

Pentagon Memorial Fund Visitor Education Center
Visual Impact Assessment

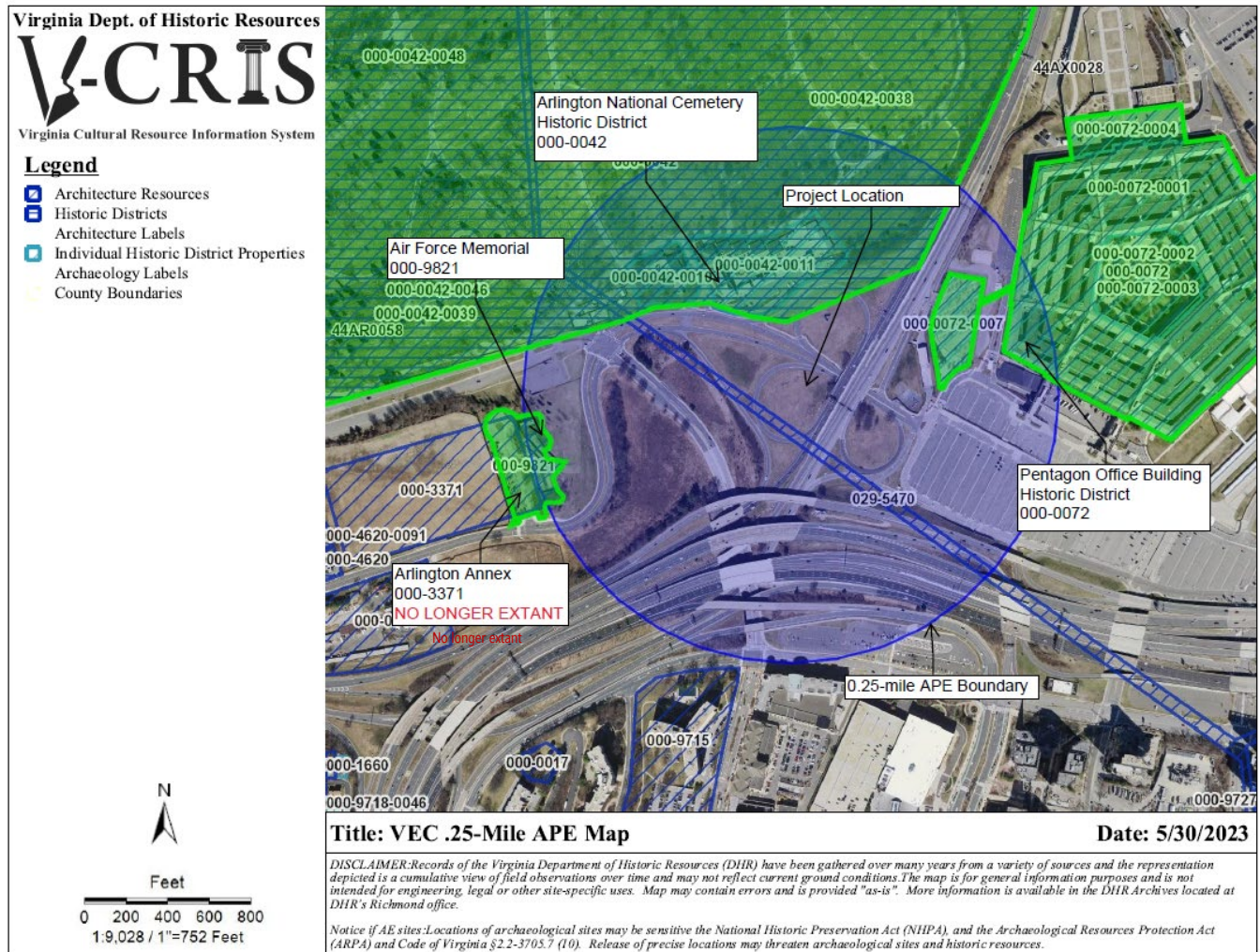


Figure 11: Previously identified resource map from VCRIS.

PENTAGON OFFICE BUILDING COMPLEX (Listed Resource)



Photograph 5: View from proposed VEC site towards Pentagon Office Building Complex (000-0072); looking east.



Photograph 6: View from the Pentagon Office Building Complex towards the proposed VEC site looking west.

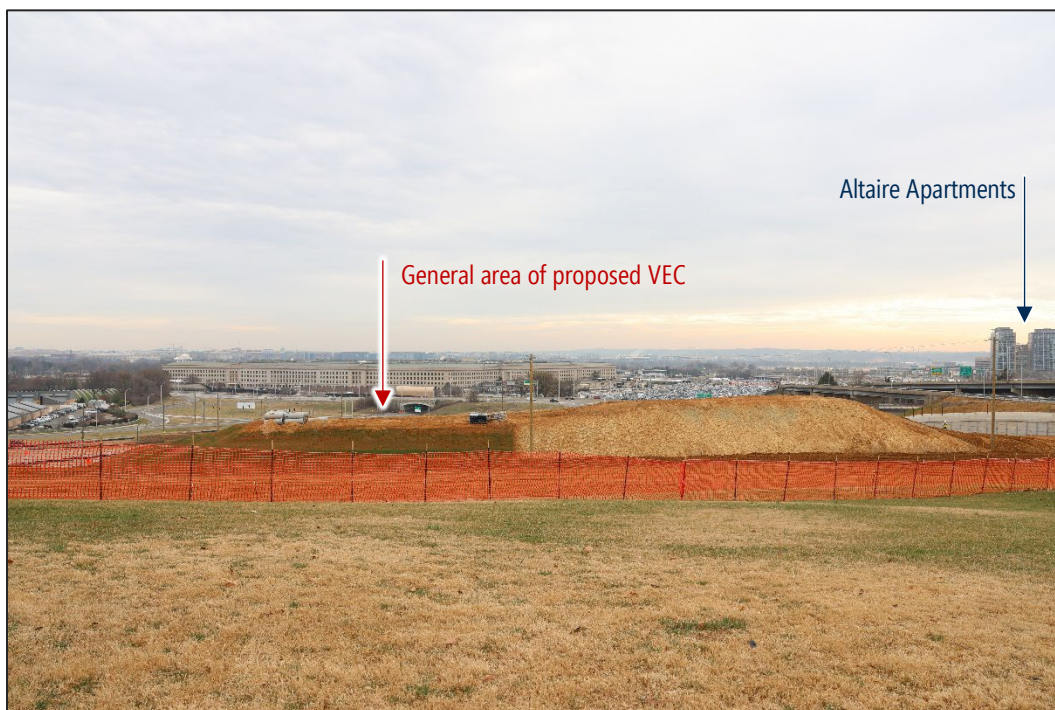
DETERMINATION

The current view from the Pentagon Office Building Complex towards the proposed VEC site includes a combination of infrastructure including Washington and South Washington Boulevards and aboveground utilities, the Sheraton Pentagon City, and the Air Force Memorial resulting in a cluttered viewshed. While the proposed building will augment the built features within the viewshed, the lower ground elevation of the site relative to the Pentagon combined with the interference of Washington Boulevard prevents a direct view between the sites. The construction of the VEC will have no adverse effect on the Pentagon Office Building Complex.

AIR FORCE MEMORIAL (Potentially Eligible Resource)



Photograph 7: View from proposed VEC site towards the Air Force Memorial (000-9821) (000-3371); looking west.



Photograph 8: View from the Air Force Memorial towards the proposed VEC; looking east.

DETERMINATION

While the proposed VEC will be visible from the Air Force Memorial, it will have a lower absolute elevation than the memorial and other buildings in the viewshed including the Pentagon and the Altaire apartment complex to the east. The comparatively low height of the proposed VEC will serve to minimize its effect on the viewshed. Furthermore, the sensitive design of the VEC will blend with the surrounding landscape to further diminish its consequence on the landscape. The construction of the VEC will have no adverse effect on the Air Force Memorial.

ARLINGTON NATIONAL CEMETERY (Listed)



Photograph 9: View from VEC site towards Arlington National Cemetery; looking northwest.



Photograph 10: View from Arlington National Cemetery toward the VEC site; looking southwest.

DETERMINATION

The views towards the proposed VEC from the closest boundaries of ANC will be disrupted by the cemetery's service complex and the treeline adjacent to South Washington Boulevard to the east of the service complex. Similarly, west of the service complex the line-of-sight will be broken by mature foliage, Southgate Road, and Columbia Pike. Additionally, the low absolute elevation of the proposed VEC will further diminish its visibility from the cemetery. The construction of the VEC will have no adverse effect on ANC.

Table 2: ANC contributing view, per ANC ICRMP, with the potential to be affected by the VEC.

RESOURCE	STATUS	PHOTOGRAPHS
View towards Air Force Memorial (View 1)	Contributing, Criterion A for military association	9-10

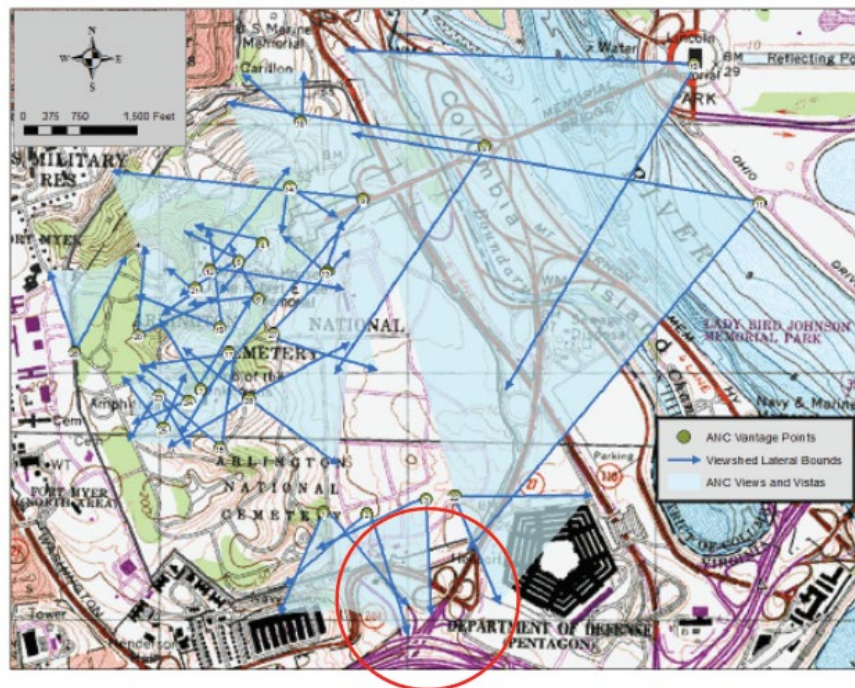


Figure 12: 0.25-mile APE identified by red circle on ICRMP map of ANC views and vistas.

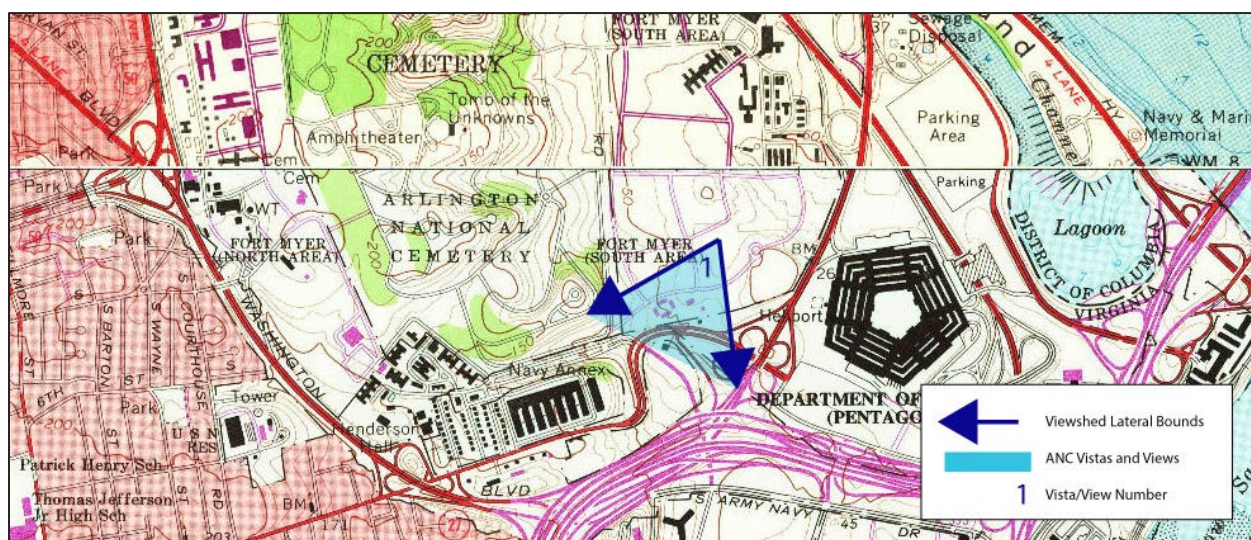
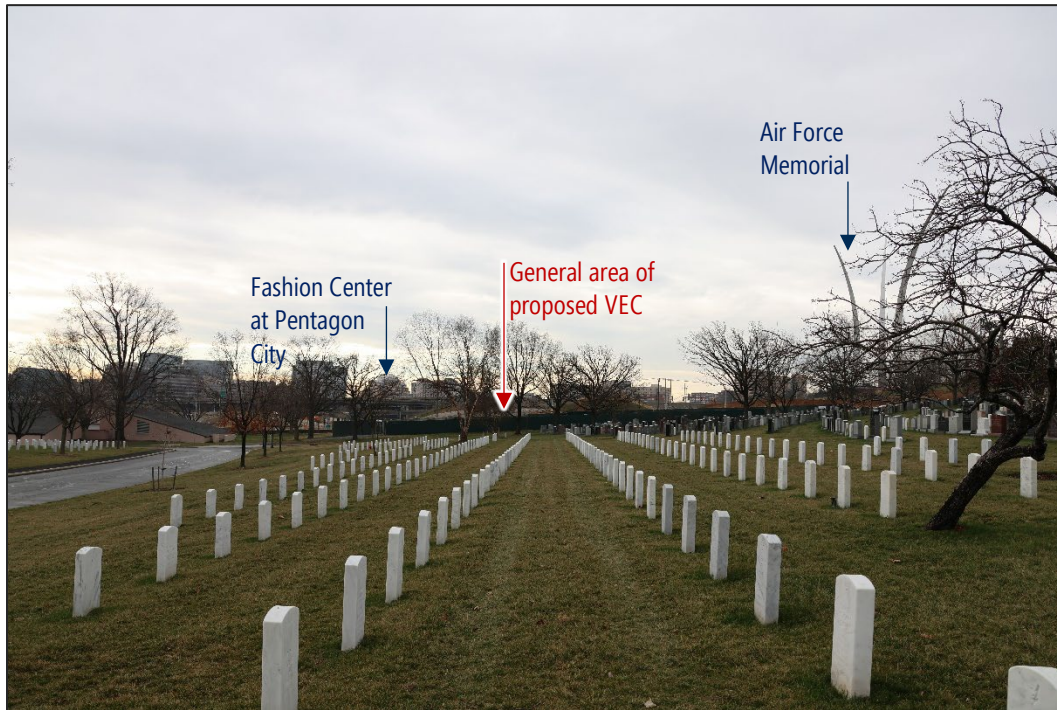


Figure 13: Arlington Nation Cemetery contributing view with the potential to be affected by the proposed VEC (Source: ANC ICRMP).

VIEW TOWARDS AIR FORCE MEMORIAL (Contributing)



Photograph 11: View towards Air Force Memorial, looking southwest.



Photograph 12: View towards Air Force Memorial, looking southwest.

DETERMINATION

The view towards the Air Force Memorial from Section 68 is identified in the ANC ICRMP as a contributing view to the Arlington National Cemetery Historic District. It is the only contributing view that includes the proposed VEC site. The view was evaluated to determine if the proposed building would affect its integrity as a contributing resource. Mature trees and the service complex completely block the line-of-sight therefore the construction of the VEC will have no effect on the view towards the Air Force Memorial.

Conclusions

This viewshed study was prepared in order to assess potential effects of the proposed construction of the on the property of the Arlington National Cemetery (ANC). The VEC is meant to provide exhibit space and support of visitors of the 9/11 Pentagon Memorial.

In order to develop an accurate APE, effects were first considered through the creation of a Digital Elevation Model (DEM), fine-tuned using line-of-sight assessments, and finalized with on-site photography. With a 0.25-mile APE, Virginia Cultural Resource Inventory System (VCRIS) and the ANC Integrated Cultural Resources Management Plan (ICRMP) were consulted to determine what previously identified resources were located within the APE. Four resources were identified: the Pentagon Office Building Complex (000-0072, Listed Resource), Air Force Memorial (000-9821, Potentially Eligible Resource), Arlington National Cemetery (000-0042, Listed Resource), and the View towards Air Force Memorial (Contributing Resource to ANC). No resources that contribute to Arlington National Cemetery are located within the APE.

Site visits took place on February 22, 2023, and March 9, 2023, so any vegetation was at its thinnest, providing the most potential for visibility between the The goal of the visits was to determine the potential impacts of the proposed VEC on historic resources within the 0.25-mile visual APE. The area surrounding the project location is characterized by a variety of development, both modern and historic, with a complex infrastructure system. All of the photographs were taken during the day, consequently this analysis did not take into account potential light pollution brought on by the proposed VEC building and parking lot.

Topography, infrastructure, buildings, and foliage serve to minimize or block views in many instances also justifying the 0.25-mile APE. After evaluating the views between the resources and the proposed VEC site, it was determined that the VEC will have no adverse effect to extant historic resources.

Bibliography

National Historic Preservation Act of 1966, Pub. L. No. 89–665, § 300101, 54 U.S.C.: National Park Service and Related Programs (1966).

Wanner, Robert. "Arlington National Cemetery Southern Expansion Site – Viewshed Study and Impact Assessment." Baltimore, Maryland: EAC/A, Inc., November 14, 2016.

Appendix A

The Arlington House, The Robert E. Lee Memorial Line of Sight Assessment

The Arlington House, The Robert E. Lee Memorial is an individually listed resource within the Arlington National Cemetery Historic District. Among its significant features, the viewshed from the house looking towards the Washington, DC skyline is particularly important. JMT completed onsite documentation and a line-of-sight assessment using Google Earth to assess any potential impacts the proposed VEC could have on this important viewshed, as well as to assess the proposed VEC's overall potential visibility from the Arlington House.

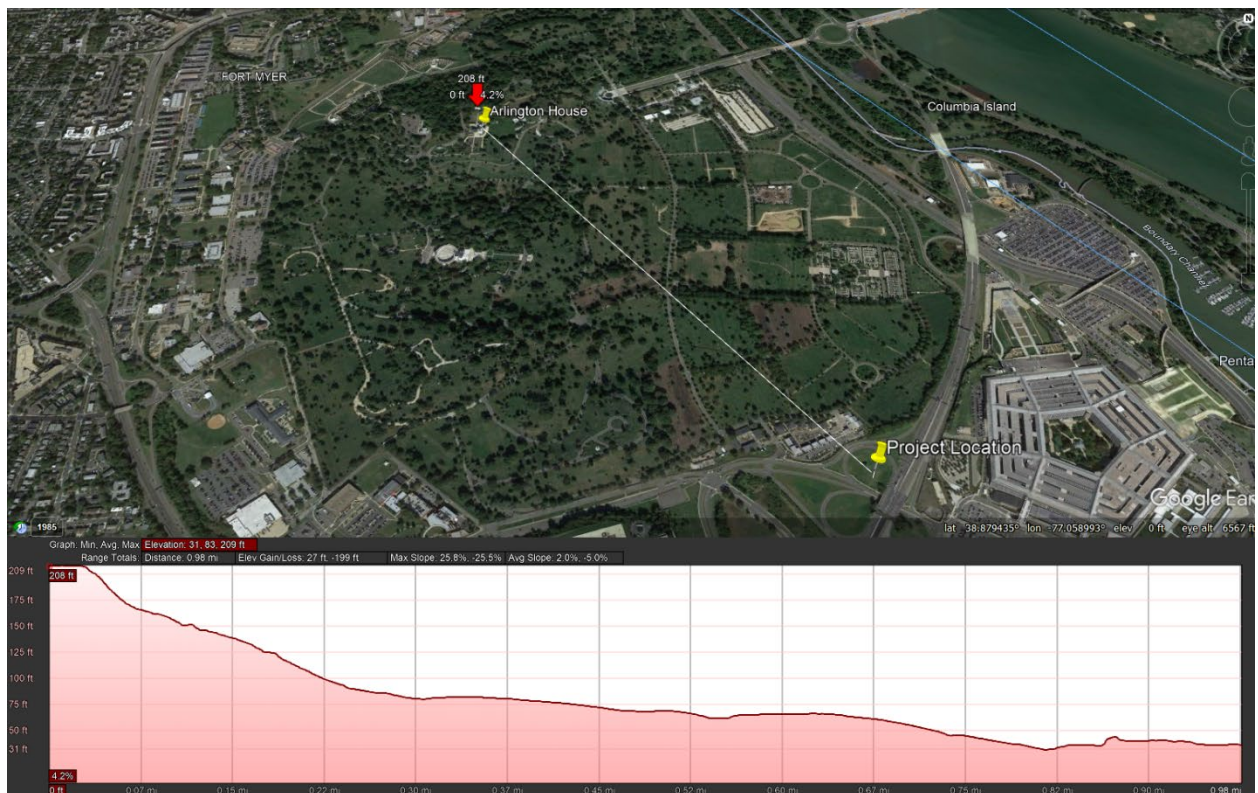


Figure 1: Elevation profile between the Arlington House and proposed VEC site.

The lack of apparent obstruction between the two points indicates the potential for visibility of the VEC from The Arlington House. However, the proposed VEC is not within Arlington House's significant viewshed towards Washington, D.C. The photographic documentation confirms the lack of impact from the proposed VEC on the character defining viewshed and indicates that visibility from the Arlington House towards the proposed VEC will be highly obstructed by

An aerial photograph of the Robert E. Lee Memorial, also known as Arlington House. The image shows the large, light-colored building complex situated on a hill. To the left of the main building is a circular driveway and a smaller structure. To the right is a large, circular green lawn. The surrounding area is filled with trees and a cemetery with many small, white headstones. A red arrow points from a text box labeled 'Arlington House, The Robert E. Lee Memorial' to the main building. Six other red arrows, numbered 1 through 6, point to specific areas: 1 points to the main building, 2 points to a smaller building to the right, 3 points to a small structure on the roof, 4 points to a small structure on the roof, 5 points to a small structure on the roof, and 6 points to a small structure on the roof. A north arrow is located in the bottom right corner of the image.



Photo 1: View looking northeast towards Washington, DC from the Arlington House, The Robert E. Lee Memorial.



Photo 2: View looking east towards Washington, DC from the Arlington House, The Robert E. Lee Memorial.



Photo 3: View looking southeast towards Washington, DC from the Arlington House, The Robert E. Lee Memorial.



Photo 4: View looking east towards Washington, DC from the Arlington House, The Robert E. Lee Memorial.



Photo 5: View looking south-southeast towards the proposed VEC site from the Arlington House, The Robert E. Lee Memorial. This is not an identified significant viewshed.



Photo 6: View looking south-southeast towards proposed VEC site from the Arlington House, The Robert E. Lee Memorial. This is not an identified significant viewshed.

Appendix F

Section 106 Consultation

Pentagon Memorial Visitor Education Center – Section 106 Consulting Parties List

9/11 Families United

Advisory Committee on Arlington National Cemetery

Advisory Council on Historic Preservation

Air Force Sergeants Association: Division 2

Air Force Washington District (AFDW/CC)

American Legion: General Billy Mitchell VA Post 85

American Legion: Dorie Miller VA Post 194

American Legion: VA Post 139

American Legion: VA Post 46

Arlington County Department of Environmental Services

Arlington County Historic Preservation Program

Arlington County Historical Affairs and Landmark Review Board

Arlington Historical Society

Arlington House Family Circle

Arlington Ridge Civic Association

Aurora Highlands Civic Association

Catawba Indian Nation (aka Catawba Indian Tribe of South Carolina)

Chickahominy Indian Tribe - Eastern Division

Delaware Nation, Oklahoma

Environmental Protection Agency, Region 3

Foxcroft Heights Neighborhood Association

Metropolitan Washington Council of Governments

Monacan Indian Nation

Nansemond Indian Nation

National Association of American Veterans, Inc.

National Capital Planning Commission

National Park Service

National Park Service, George Washington Memorial Parkway

National Register & National Historic Landmarks Program, National Park Service

Pamunkey Indian Tribe

Preservation Virginia

Rappahannock Tribe, Inc.

September 11th Families Association

September 11th Families for Peaceful Tomorrows

The Black Heritage Museum of Arlington

The Guild of Professional Tour Guides of Washington, DC

United States Commission of Fine Arts

Upper Mattaponi Tribe

Virginia Department of Environmental Quality

Washington Headquarters Services

Veterans of Foreign Wars



DEPARTMENT OF THE ARMY
ARMY NATIONAL MILITARY CEMETERIES
ARLINGTON NATIONAL CEMETERY
ARLINGTON, VIRGINIA 22211-5003

March 25, 2023

Julie V. Langan
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

ATTN: Adrienne Birge-Wilson
Project Review Architectural Historian
Review & Compliance Division

Dear Ms. Langan:

Army National Military Cemeteries (ANMC) would like to take this opportunity to formally initiate the consultation process with the Virginia Department of Historic Resources in accordance with Section 106 of the National Historic Preservation Act, 16 U.S.C. § 470f, and its implementing regulations, 36 C.F.R. Part 800. The Pentagon Memorial Fund (PMF), with Army National Military Cemeteries (ANMC) as the lead federal agency, is proposing the construction of a Visitor's Education Center (VEC) on Arlington National Cemetery (ANC) property for the existing 9/11 Pentagon Memorial. The proposed project is considered a federal undertaking with the potential to cause adverse effects on historic properties pursuant to 36 C.F.R. 800.3(a).

The proposed VEC would include exhibits and programs to engage visitors and educate the public as to the effects and broad impact of the tragedy from a variety of perspectives. While a memorial exists that honors the 184 lives that were lost as a result of the attack on the Pentagon, there is no Visitor Education Center that provides an understanding of the events of that day, the lives lost, and the historic significance of the 9/11 Pentagon Memorial Site. The proposed VEC would provide details of the 184 individuals who lost their lives on 9/11, interpretive displays discussing the symbolism of the memorial design, permanent restrooms, shelter for visitors, a café, bookstore, and conference space.

The proposed VEC would be sited on a parcel of approximately 3.71 acres within the ANC Southern Expansion site. After the reconfiguration of roadways from the Federal Highway Administration's Defense Access Roadway project, the VEC would be bounded by Columbia Pike, East Joyce Street, and Washington Boulevard (see attached map). In accordance with the National Historic Preservation Act (NHPA) of 1966, as amended, ANMC is initiating the Section 106 process to receive concurrence on the Area of Potential Effect (APE) and proposed consulting parties to be included in

the process. In addition, ANMC finds that this potential undertaking affects National Register of Historic Places and National Register eligible historic properties, and that there are no properties within the APE that have not been previously evaluated for National Register eligibility.

The proposed undertaking would include the construction of a new building with an approximate absolute elevation of 109 feet at the highest point at the SE corner of the building, which includes the rooftop mechanical enclosure. The absolute elevation of the remaining building will be 95 feet. At this time, the exact siting of the facility on the parcel has yet to be finalized, however, the building is anticipated to be constructed at the northeastern end of the site with a building footprint ranging from 25,000 and 30,000 square feet. Up to 100 parking spaces are anticipated and would be located to the south of the building. An entrance on South Joyce Street will serve as the access point for cars, buses, and service vehicles.

In accordance with Section 106, ANMC proposes a 0.25-mile APE surrounding the VEC based on the height of the building and surrounding topography. This quarter-mile boundary considers the potential direct and indirect visual impacts of the building, on the landscape and nearby resources listed in or eligible for listing in the National Register of Historic Places (NRHP). There are four previously listed or potentially eligible historic resources within the APE. The listed resources are the Arlington National Cemetery Historic District (000-0042), the Pentagon Office Building Historic District (000-0072), and the Arlington Annex (000-3371). The potentially eligible resource within the APE is the Air Force Memorial (000-9821). No archaeological resources are located within the APE.

Per 36 CFR § 800.3(c), ANMC plans to involve consulting parties in the Section 106 process. ANMC's initial coordination will include corresponding with the consulting parties identified below notifying them of the availability of the Section 106 Package and Visual Impact Assessment on the ANMC and PMF website providing them with a 30-day review period. Once the project reaches the assessment of effects phase, consulting parties will be notified of and invited to a public meeting. Finally, should the project result in an adverse effect and require mitigation, consulting parties will be notified of a 30-day period for which input will be collected.

Proposed consulting parties include the following:

- Air Force District of Washington
- Arlington County government, including the Historic Preservation Program & the Historical Affairs and Landmark Review Board (HALRB)
- Arlington Historical Society
- The Black Heritage Museum of Arlington
- The Commission of Fine Arts
- DC Historic Preservation Office
- Department of Defense (DoD)
- Descendant communities connected to ANC, Arlington House, and the greater Arlington community, including descendants of the enslaved people at Arlington

House (Syphax, Gray, Branham, Parks, and other families), the Lee and Custis families, the residents of Freedman's Village and Queen City

- George Washington Memorial Parkway (GWMP)
- The Guild of Professional Tour Guides of Washington, DC
- National Capital Planning Commission
- National Park Service (NPS)
- Preservation Virginia
- Washington Headquarters Services (WHS)

Federally recognized Native American Tribes have also been identified as potential consulting parties. These tribes include:

- Delaware Tribe of Indians
- Cherokee Nation
- Oneida Tribe of Indians in Wisconsin
- Seneca-Cayuga Tribe of Oklahoma
- Pamunkey Indian Tribe
- Catawba Indian Nation
- Tuscarora Nation
- Eastern Band of Cherokee Indians
- Oneida Nation
- Seneca Nation of Indians
- Saint Regis Mohawk Tribe
- Eastern Shawnee Tribe of Oklahoma
- Delaware Nation
- Tonawanda Band of Seneca
- United Keetowah Band of Cherokee Indians
- Cayuga Nation
- Absentee-Shawnee Tribe of Indians of Oklahoma

The following documents are enclosed with this submission:

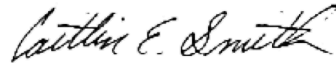
1. Section 106 Initiation Document: Project Description, Identification of Consulting Parties, Identification of Historic Properties, & Area of Potential Effects
2. Draft Visual Impact Assessment
3. Southern Expansion Reference Documents:
 - a. Environmental Assessment for the Southern Expansion and Associated Roadway Realignment, 2019
 - b. Archaeological and Historical Evaluations for the Arlington National Cemetery Southern Expansion Project, 2016
 - c. Memorandum of Agreement for the Southern Expansion Project, 2019

By way of this submission, ANMC requests the DHR:

1. Assign a project review number to the project.
2. Respond to ANMC's request for review of finding of effect on historic properties.
3. Provide concurrence or comments on the determined APE.
4. Provide concurrence or comments on the identified potential consulting parties.

Army National Military Cemeteries looks forward to beginning the Section 106 consultation process with our agency partners, consulting parties, and the public. Should there be any questions, please contact Caitlin Smith, ANMC Cultural Resources Program Manager, usarmy.pentagon.hqda-anc-osa.mbx.cultural-resources@army.mil. Thank you for your support.

Sincerely,

A handwritten signature in black ink, reading "Caitlin E. Smith". The signature is written in a cursive, flowing style.

CAITLIN E. SMITH
Cultural Resources Program Manager
Engineering, Planning & Resources
Army National Military Cemeteries

**Notice of Public Meeting
for Section 106 Public Consultation
Regarding the Construction of the
Pentagon Memorial Fund (PMF) Visitor Education Center (VEC)
on the Grounds of
Arlington National Cemetery
Department of the Army**

The Pentagon Memorial Fund (PMF), with Army National Military Cemeteries (ANMC) as the lead federal agency, is proposing to construct and operate a Visitor Education Center (VEC) for the existing 9/11 Pentagon Memorial on the grounds of Arlington National Cemetery (ANC). PMF is hosting a Section 106 consulting party/public meeting to provide background information on the project and solicit feedback from interested parties. There will be a presentation on the project then attendees will have the opportunity to ask questions and provide comments.

DATE: September 6, 2023

TIME: 5:30 PM to 7:30 PM

LOCATION: MGAC Offices located at 730 11th Street NW, Washington, DC 20001

The closest Metro stop is Metro Center. Masks for COVID-19 protection are optional. The meeting location is accessible to persons with disabilities and arrangements can be made to accommodate most needs. Seating is limited to the first 25 attendants; however, virtual attendance via Microsoft Teams will also be available. Please contact Sara McLaughlin of JMT for more details.

Meeting materials are available on PMF's website at <https://pentagonmemorial.org> as well as ANC's website at www.arlingtoncemetery.mil/About/Policies-and-Public-Notices/Public-Notices.

Written comments may be submitted by mail to:

Sara McLaughlin
Johnson, Mirmiran and Thompson
1600 Market St Ste 520,
Philadelphia, PA 19103

Comments may also be submitted by email to smclaughlin@jmt.com. Comments will be received through September 27, 2023.



DEPARTMENT OF THE ARMY
ARMY NATIONAL MILITARY CEMETERIES
ARLINGTON NATIONAL CEMETERY
ARLINGTON, VIRGINIA 22211-5003

November 16, 2023

Ms. Jennifer Bellville-Marion
Project Review Archaeologist
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

SUBJECT: National Historic Preservation Act Section 106 for the Operation and Construction of the Pentagon Memorial Fund Visitor Education Center on the grounds of Arlington National Cemetery, Arlington, Virginia

Dear Ms. Bellville-Marion:

The Army National Military Cemeteries (ANMC) together with the Pentagon Memorial Fund (PMF) are continuing the Section 106 process for the proposed construction of the Visitor's Education Center (VEC) that will support the existing Pentagon Memorial (DHR File No. 2023-4078).

In a previous correspondence, ANMC introduced the undertaking for the construction of the proposed VEC. The goal of the building would be to provide details of the 184 individuals who lost their lives on 9/11, interpretive displays discussing the symbolism of the memorial design, permanent restrooms, shelter for visitors, a café, store, and conference space. The proposed undertaking would include the construction of a new building with an approximate absolute elevation of 91 feet at the highest point at the SE corner of the building, which includes the rooftop mechanical enclosure. The absolute elevation of the remaining building will be 75 feet. The building is expected to be constructed at the northeastern end of the site with a building footprint ranging from 25,000 and 30,000 square feet. Up to 100 parking spaces are expected and would be located to the south of the building. An entrance on South Joyce Street will serve as the access point for cars, buses, and service vehicles. This conceptual design has received approval from both the National Capital Planning Commission (NCPC) and the U.S. Commission of Fine Arts (CFA) in the interim between now and when the undertaking was first initiated with you/ your organization.

Per 36 CFR § 800.3(c), ANMC is involving consulting parties in the Section 106 process. Please refer to Attachment B for a full list of consulting parties. A Consulting Parties Meeting was held on September 6, 2023, and many parties were present both in person and virtually. A recording of the meeting has been made available online and is located on the ANC and PMF websites. The meeting included a presentation about the undertaking, followed by a forum allowing for questions and comments. In addition to the comments received during the meeting, additional comments were submitted in the subsequent comment period. The recording can be found here: <https://www.youtube.com/watch?v=jXiKFm61J7o>

Based on these comments, ANMC feels that the appropriate way to proceed with the Section 106 consultation is to reopen the comment period for additional consulting parties and to provide all parties with the opportunity to review new information in response to comments received. This new information includes an updated Visual Impact Assessment, updated conceptual design drawings, and conceptual design approval letters from the U.S. Commission of Fine Arts (CFA) and the National Capital Planning Commission (NCPC). The new information can be found online at the PMF website:

<https://pentagonmemorial.org/>. The information is also available on the Arlington National Cemetery website: <https://www.arlingtoncemetery.mil/About/Policies-and-Public-Notices/Public-Notices>.

In addition to the comments received during the Consulting Parties Meeting, ANMC is responding to comments received from the Virginia Department of Historic Resources. The comments, received in response to the Section 106 initiation letter dated June 27, 2023, requested additional information on the massing and height of the proposed building, along with its location on the site. In the time since these comments were received, the proposed conceptual design and site plan for the VEC has been reviewed by CFA and NCPC, receiving approval from both entities.

In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), ANMC is soliciting interest from potential consulting parties for this project and is seeking comments on the determined area of potential effects (APE) and the identification of historic properties. A list of current consulting parties is included for reference with this letter.

Please provide your comments on the updated information regarding the undertaking within fifteen (15) days of receipt of this letter. All comments on the enclosed documents should be sent to Sara McLaughlin of JMT, via email: smclaughlin@jmt.com.

Sincerely,

CAITLIN E. SMITH
Cultural Resources Program Manager
Engineering, Planning & Resources
Army National Military Cemeteries

Attachments:

- A Map of Area of Potential Effects
- B Consulting Party List

Selected project background information:

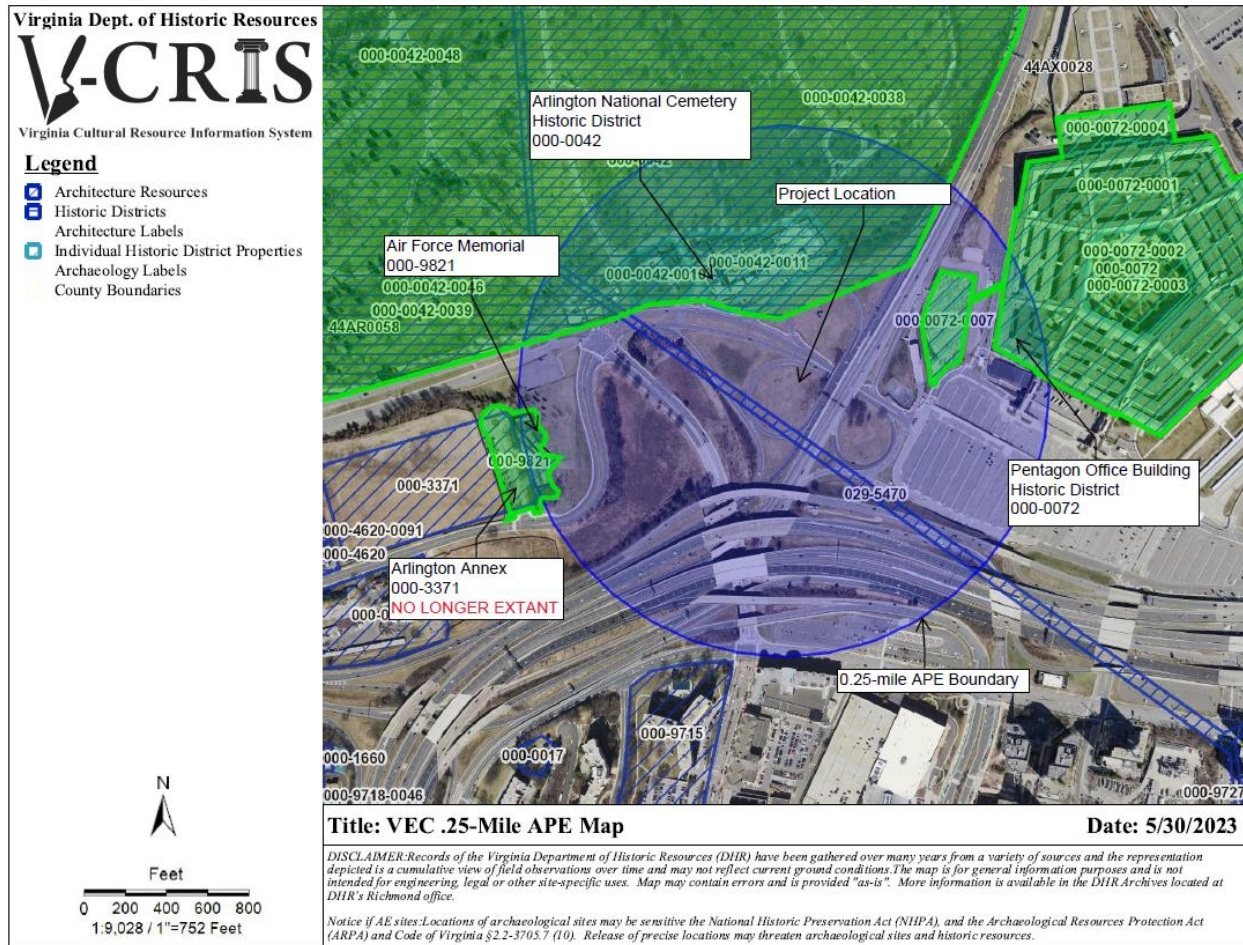
- [PMF VEC: Section 106 Initiation Letter](#)
- [PMF VEC: Section 106 Initiation Package](#)
- [Project Overview and Scoping Boards](#)
- [Public Notice: Public/Agency Scoping Meeting, December 12, 2022](#)
Commission of Fine Arts Letter Approving the PM VEC Concept Design (Sept. 27, 2023)
- [Commission of Fine Arts PM VEC Concept Design Presentation \(Sept. 21, 2023\)](#)
- [National Capital Planning Commission Letter Approving Comments on the PM VEC Concept Design \(July 6, 2023\)](#)
- [Visual Impact Assessment: Pentagon Memorial Visitor Education Center \(Updated October 2023\)](#)
- [PM VEC Consulting Party Meeting Minutes \(Sept. 6, 2023\)](#)
- PM VEC Consulting Parties Meeting Video Recording (Sept. 6, 2023)
- [Consulting Party Letter: Attachment B- List of Consulting Parties \(Nov. 2023\)](#)

Arlington National Military Cemetery Historic District National Register Report can be downloaded at:
<https://www.dhr.virginia.gov/historic-registers/000-0042/>

Information about Section 106 of the National Historic Preservation Act can be found here:
<https://www.achp.gov/protecting-historic-properties>

Information about the ongoing compliance process can be found on the ANC Public Notices page of the ANC website at: <https://www.arlingtoncemetery.mil/About/Policies-and-Public-Notices/Public-Notices>

Attachment A: Map of Area of Potential Effects





DEPARTMENT OF THE ARMY
ARMY NATIONAL MILITARY CEMETERIES
ARLINGTON NATIONAL CEMETERY
ARLINGTON, VIRGINIA 22211-5003

November 29, 2023

SUBJECT: National Historic Preservation Act Section 106 for the Operation and Construction of the Pentagon Memorial Fund Visitor Education Center on the grounds of Arlington National Cemetery, Arlington, Virginia

Dear Consulting Party:

The Pentagon Memorial Fund (PMF), with Army National Military Cemeteries (ANMC) as the lead federal agency, is proposing the construction of a Visitor's Education Center (VEC) on Arlington National Cemetery (ANC) property for the existing 9/11 Pentagon Memorial. The proposed VEC would include exhibits and programs to engage visitors and educate the public as to the effects and broad impact of the tragedy from a variety of perspectives. While a memorial exists that honors the 184 lives that were lost as a result of the attack on the Pentagon, there is no VEC that provides an understanding of the events of that day, the lives lost, and the historic significance of the 9/11 Pentagon Memorial Site. The proposed VEC would provide details of the 184 individuals who lost their lives on 9/11, interpretive displays discussing the symbolism of the memorial design, permanent restrooms, shelter for visitors, a café, bookstore, and conference space.

The proposed VEC would be sited on a parcel of approximately 3.71 acres within the ANC Southern Expansion site. After the reconfiguration of roadways from the Federal Highway Administration's Defense Access Roadway project, the VEC would be bounded by Columbia Pike, South Joyce Street, and Washington Boulevard (see attached map). In accordance with the National Historic Preservation Act (NHPA) of 1966, as amended, on May 25, 2023, ANMC initiated the Section 106 process to receive concurrence on the Area of Potential Effect (APE) and proposed consulting parties to be included in the process (Attachment A). In addition, ANMC found that this potential undertaking affects National Register of Historic Places and National Register eligible historic properties, and that there are no properties within the APE that have not been previously evaluated for National Register eligibility.

The proposed undertaking would include the construction of a new building with an approximate absolute elevation of 91 feet at the highest point at the SE corner of the building, which includes the rooftop mechanical enclosure. The absolute elevation of the remaining building will be 75 feet. The building is expected to be constructed at the northeastern end of the site with a building footprint ranging from 25,000 and 30,000 square feet. Up to 100 parking spaces are expected and would be located to the south of the building. An entrance on South Joyce Street will serve as the access point for cars, buses, and service vehicles. This conceptual design has received approval from both the National Capital Planning Commission (NCPC) and the U.S. Commission of Fine Arts (CFA) in the interim between now and when the undertaking was first initiated with you/ your organization.

In accordance with Section 106, ANMC proposes a 0.25-mile APE surrounding the VEC based on the height of the building and surrounding topography. This quarter-mile boundary considers the potential direct and indirect visual impacts of the building, on the landscape and nearby resources listed in or

eligible for listing in the National Register of Historic Places (NRHP). There are four previously listed or potentially eligible historic resources within the APE. The listed resources are the Arlington National Cemetery Historic District (000-0042), the Pentagon Office Building Historic District (000-0072), and the Arlington Annex (000-3371). The potentially eligible resource within the APE is the Air Force Memorial (000-9821). No archaeological resources are located within the APE.

Per 36 CFR § 800.3(c), ANMC is involving consulting parties in the Section 106 process. Please refer to Attachment B for a full list of consulting parties. Supporting documents for the proposed undertaking have been made available for public review on ANMC and PMF websites. These documents include the proposed conceptual design of the building and site, a Visual Impact Assessment, additional background documentation developed for the Southern Expansion project, and the Section 106 initiation package submitted to the Virginia Department of Resources (DHR). Please view the documents here: <https://www.arlingtoncemetery.mil/About/Policies-and-Public-Notices/Public-Notices>. The documents are also available on the PMF website: <https://pentagonmemorial.org/>.

In accordance with 36 CFR § 800.3(c), ANMC hosted a Consulting Parties Meeting on September 6, 2023, and many parties were present both in person and virtually. A recording of the meeting has been made available online and is located on the ANC and PMF websites. The meeting included a presentation about the undertaking, followed by a forum allowing for questions and comments. In addition to the comments received during the meeting, additional comments were submitted in the subsequent comment period. A recording of the meeting can be found on both the PMF and ANC websites.

To address the comments that were received at this public meeting, ANMC is initiating a secondary comment period to allow for review of updated documentation and the inclusion of additional consulting parties. You/Your organization is formally invited to participate in the Section 106 process as a consulting party for this undertaking. The updated documentation includes an updated Visual Impact Assessment, updated conceptual design drawings, and conceptual design approval letters from the U.S. Commission of Fine Arts (CFA) and the National Capital Planning Commission (NCPC). For reference, the most recent presentation of the proposed building design and site plan is available on both the PMF and ANC websites.

In addition to the comments received during the Consulting Parties Meeting, ANMC is responding to comments received from the Virginia Department of Historic Resources. The comments, received in response to the Section 106 initiation letter dated June 27, 2023, requested additional information on the massing and height of the proposed building, along with its location on the site. In the time since these comments were received, the proposed conceptual design and site plan for the VEC has been reviewed by CFA and NCPC, receiving approval from both entities.

In accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), ANMC is soliciting interest from potential consulting parties for this project and is seeking comments on the determined area of potential effects (APE) and the identification of historic properties. A list of current consulting parties is included for reference with this letter.

Please notify Ms. McLaughlin of JMT of your/your organization's interest in being a consulting party for this project. Please provide your comments on the updated information regarding the undertaking within fifteen (15) days of receipt of this letter. All comments on the enclosed documents should be sent to Sara McLaughlin of JMT, via email: smclaughlin@jmt.com.

Sincerely,

CAITLIN E. SMITH
Cultural Resources Program Manager
Engineering, Planning & Resources
Army National Military Cemeteries

Attachments:

- A Map of Area of Potential Effects
- B Consulting Party List

Selected project background information:

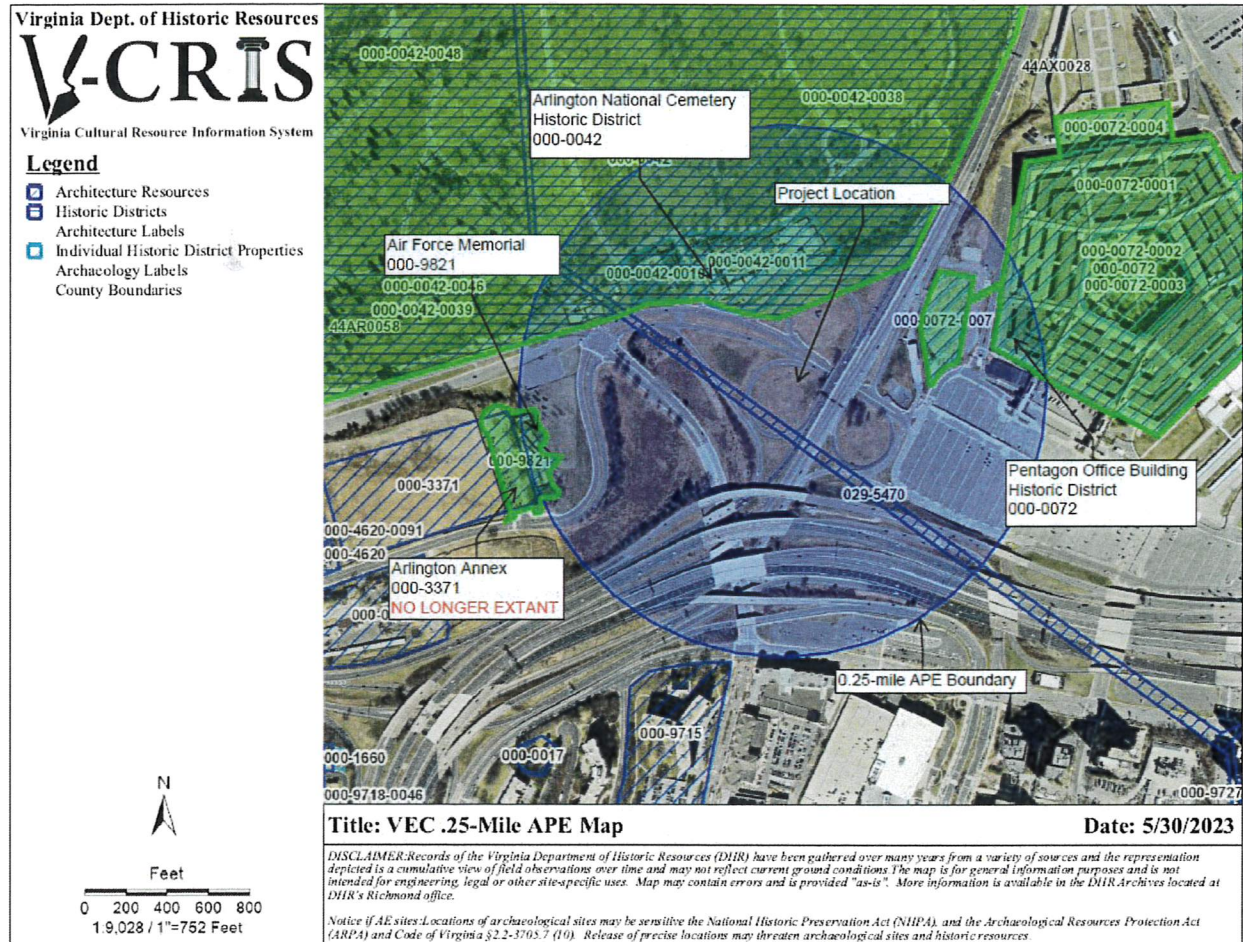
- [PMF VEC: Section 106 Initiation Letter](#)
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- [Project Overview and Scoping Boards](#)
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- [PM VEC Consulting Parties Meeting Video Recording \(Sept. 6, 2023\)](#)
- [Consulting Party Letter: Attachment B- List of Consulting Parties \(Nov. 2023\)](#)

Arlington National Military Cemetery Historic District National Register Report can be downloaded at:
<https://www.dhr.virginia.gov/historic-registers/000-0042/>

Information about Section 106 of the National Historic Preservation Act can be found here:
<https://www.achp.gov/protecting-historic-properties>

Information about the ongoing compliance process can be found on the ANC Public Notices page of the ANC website at: <https://www.arlingtoncemetery.mil/About/Policies-and-Public-Notices/Public-Notices>

Attachment A: Map of Area of Potential Effects





DEPARTMENT OF THE ARMY
ARMY NATIONAL MILITARY CEMETERIES
ARLINGTON NATIONAL CEMETERY
ARLINGTON, VIRGINIA 22211-5003

April 2, 2024

SUBJECT: Public Comment Period for National Historic Preservation Act Section 106 for the Operation and Construction of the Pentagon Memorial Fund Visitor Education Center on the grounds of Arlington National Cemetery, Arlington, Virginia

On 25 March 2023, Army National Military Cemeteries (ANMC), together with the Pentagon Memorial Fund (PMF), initiated the consultation process with the Virginia State Historic Preservation Office (SHPO) in accordance with Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470f, and its implementing regulations, 36 C.F.R. Part 800. ANMC notified the Virginia Department of Historic Resources (DHR) of the proposed undertaking to construct and operate a Visitor's Education Center (VEC) to support the existing 9/11 Pentagon Memorial. In the following year, ANMC and PMF held a meeting for the public and consulting parties and facilitated several comment periods. This allowed the public and interested parties to review and comment on the agency's finding of effect on historic properties, identification of the area of potential effects, and identification of consulting parties.

With this notice, ANMC informs consulting parties and the public that, in accordance with Section 106 of the NHPA, the agency has applied the criteria of adverse effects (36 CFR § 800.5[a][1]) to the undertaking and finds that the proposed project would have no adverse effects to the three historic properties located in the undertaking's Area of Potential Effects (APE). The public can view the Assessment of Effects (AOE) documentation submitted to the DHR on both the ANC and PMF websites: <https://www.arlingtoncemetery.mil/About/Policies-and-Public-Notices/Public-Notices> (ANC) and <https://www.pentagonmemorial.org/public-notices/> (PMF). The documentation includes all consultation records to date, and an assessment of potential effects to the three historic properties in the APE. In addition, the public can view correspondence between the DHR and ANMC, consulting party meeting records, and reviews and approvals from the the U.S. Commission of Fine Arts (CFA) and the National Capital Planning Commission (NCPC).

With this notice, ANMC also initiates a 30-day comment period on the AOE. ANMC welcomes all interested parties and members of the public to share their input on the agency's Section 106 process findings. Comments are due no later than May 2, 2024.

Please send your comments by mail or email to:
Sara McLaughlin
Johnson, Mirmiran and Thompson
1600 Market St Ste 520,
Philadelphia, PA 19103
smclaughlin@jmt.com

Thank you for your interest in Arlington National Cemetery.



DEPARTMENT OF THE ARMY
ARMY NATIONAL MILITARY CEMETERIES
ARLINGTON NATIONAL CEMETERY
ARLINGTON, VIRGINIA 22211-5003

April 2, 2024

SUBJECT: National Historic Preservation Act Section 106 for the Operation and Construction of the Pentagon Memorial Fund Visitor Education Center on the grounds of Arlington National Cemetery, Arlington, Virginia (DHR Project No. 2023-4078)

Ms. Jennifer Bellville-Marion
Project Review Archaeologist
Virginia Department of Historic Resources
2801 Kensington Avenue
Richmond, VA 23221

Dear Ms. Bellville-Marion:

Army National Military Cemeteries (ANMC) together with the Pentagon Memorial Fund (PMF) are continuing the Section 106 compliance process for the proposed construction and operation of a Visitor's Education Center (VEC) to support the existing 9/11 Pentagon Memorial (DHR File No. 2023-4078). With this letter, ANMC notifies Virginia Department of Historic Resources (DHR) that, in accordance with Section 106 of the National Historic Preservation Act (NHPA), the agency has applied the criteria of adverse effects (36 CFR § 800.5[a][1]) to the undertaking and finds that the proposed project would have **no adverse effects** to historic properties in the Area of Potential Effects (APE).

In previous correspondence ANMC introduced the undertaking for the construction of the proposed VEC. The goal of the building would be to provide details of the 184 individuals who lost their lives on 9/11, interpretive displays discussing the symbolism of the memorial design, permanent restrooms, shelter for visitors, a café, store, and conference space. The proposed undertaking would include the construction of a new building with an approximate absolute elevation of 91 feet at the highest point at the SE corner of the building, which includes the rooftop mechanical enclosure. The absolute elevation of the remaining building will be 75 feet. The building is expected to be constructed at the northeastern end of the site with a building footprint ranging from 25,000 and 30,000 square feet. Up to 100 parking spaces are expected and would be located to the south of the building. An entrance on South Joyce Street will serve as the access point for cars, buses, and service vehicles. This conceptual design has received approval from both the National Capital Planning Commission (NCPC) and the U.S. Commission of Fine Arts (CFA). The design package included proposed façade renderings, site plans, material selections, and renderings providing visualization of the

proposed building from different viewpoints of the surrounding area. The design submissions and approval letters can be viewed on the ANC and PMF websites: <https://www.arlingtoncemetery.mil/About/Policies-and-Public-Notices/Public-Notices> and <https://www.pentagonmemorial.org/public-notices/>.

Per 36 CFR § 800.3(c), ANMC included the public in the Section 106 consultation process. All relevant project materials were made available online in two locations, the ANC and PMF websites listed above. The online information included a list of consulting parties, products related to the public scoping meeting and the consulting party meeting, Section 106 documentation, a Visual Impact Assessment (VIA), design approval letters from both the CFA and the NCP, and the approved conceptual design drawings. All parties were invited to participate in two comment periods and a public meeting with a public forum to comment on the undertaking, identification of the project APE and historic properties, and the VIA. Overall, ANMC received 45 comments during these periods, and has responded accordingly. Please refer to Attachment C for a compilation of all comments received as a part of the Section 106 consultations phase.

After consideration of all comments received from VDHR, consulting parties and the public, ANMC has assessed potential effects of the project on each of the three above-ground historic properties in the APE. While there are no eligible archaeological resources within the project APE, ANMC has also assessed potential effects of the VEC project to unknown archaeological resources. ANMC finds that there are **no adverse effects** to the characteristics that qualify the three historic properties in the undertaking's APE for inclusion in or eligibility for the National Register of Historic Places (NRHP):

- Arlington National Cemetery Historic District (000-0042)
- Pentagon Office Building Complex (000-0072)
- Air Force Memorial (000-9821)

Construction and operation of the proposed VEC will be outside the boundaries of the three historic properties in the undertaking's APE. Nonetheless, the construction and operation of the VEC will have direct impacts on all three. The roadways immediately surrounding the site will be temporarily impacted by construction, and in the long-term increased traffic is anticipated due to the addition of a public building / community facility. There are no long-term impacts to land use or public access, as the project area for the proposed undertaking is within the grounds of a government facility. Arlington County categorizes the land use for the project area as government / community facility. The surrounding area is categorized as government / community facility and residential. The site of the proposed VEC is zoned S-3A, Special Districts by Arlington County. The proposed VEC would be considered a permitted use under Section 3.A.3 of the County's Zoning ordinance as "Public buildings and properties of a cultural, recreational administrative or service type, including libraries, fire stations, museums and art galleries but not including repair garages, storage or repair yards or warehouses."

There will be viewshed changes for the three historic properties in the undertaking's APE. The VEC will be visible from portions of each site, however, the impacts are minimized by siting the VEC at the lowest elevation within the licensed parcel, by integrating the building into the surrounding hillside, and limiting the first-floor building height to approximately 36'-0" and the maximum elevation of the building to 91'-0". As such, the VEC will not completely block or obstruct views to or from the three historic properties. Washington, DC is still prominently visible from within each site. The VEC's elevation is below that of the surrounding highways, which obscure views of the building from the south and east. See Attachment D: Section 106 Process Submission: Assessment of Effects, for supporting documentation. In addition, landscaping plans for both the Southern Expansion and VEC projects include maintaining existing vegetation and planting additional trees along their boundaries, adjacent to the roadways. This provides additional visual screening between the VEC and the surrounding historic properties.

The NRHP nominations for all three historic properties state their significant representation of themes related to military commemoration, architecture, landscape architecture, politics and government. They are also representative of the design and development of the monumental core that connects Arlington, VA, and Washington, DC. The interconnected viewsheds are an important part of the location, design, setting, feeling, and association of these three sites. The VEC design takes this into consideration and mitigates the impacts to these historic properties. Furthermore, the NRHP nominations for all three sites categorize them as commemorative properties. The proposed VEC, with its connection to the National 9/11 Pentagon Memorial, the commemorative nature of its landscape and structure, is compatible with the location, design, setting, materials, feeling, and association of the historic properties.

The VEC design avoids and/or minimizes the direct, indirect, and cumulative effects to above- and below- ground historic properties and contributing elements in the undertaking's APE. There will be no adverse effects to the integrity of the historic properties that would diminish their historical and architectural significance. There are no adverse impacts to the characteristics that qualify the historic properties for inclusion in or eligibility for the National Register of Historic Places (NRHP).

As explained in Attachment D and the VIA, the potential visibility of the proposed VEC from the Arlington National Cemetery Historic District will be negligible. The Arlington National Cemetery Historic District will retain its historic views and vistas within the cemetery after construction of the VEC. The building will not be visible from most parts of the cemetery, due to its height and setting at the lowest elevation within the licensed parcel. It may impact the contributing viewsheds and vistas from within the ANC historic district's southern end, around sections 8, 66, and 67, looking towards the Air Force Memorial. These impacts, however, are mitigated by siting the building at the lowest available elevation, by integrating the building into the surrounding hillside, limiting the height of the building, and by maintaining the use of vegetation as a visual barrier. Otherwise, the cemetery maintains its historic location and character-defining elements. There will be no irreversible changes to the historic property. The

construction of the VEC will not result in changes to the integrity of design, setting, workmanship, materials, location, association, and feeling of the overall ANC Historic District in a way that would change ANC's status on the NRHP. No direct physical changes will be made to areas inside the cemetery's boundary, marked by the new boundary wall constructed as part of the Southern Expansion project. Headstones and circulation patterns in the cemetery remain unchanged. The cemetery continues to convey its historic significance as a military cemetery, for its landscape architecture and architecture. The construction of the VEC will not result in changes to the historic integrity of design, setting, workmanship, materials, location, association, and feeling of the district.

The Pentagon Office Building Complex, in addition to being listed on the NRHP, is listed on the Virginia Landmarks Register (VLR) and is listed as a National Historic Landmark (NHL). The proposed undertaking will be visible from the Pentagon Office Building Complex Historic District. However, the historic district will also retain its historic views to Washington, DC, the Potomac River, ANC, the Air Force Memorial, and the National 9/11 Pentagon Memorial. The construction and operation of the VEC will not result in irreversible changes to the location and integrity of the historic property. The resource will continue to convey its significance of architecture, planning, and association to war time. There will be no changes to the district's integrity of location, workmanship, feeling, association, design, and materials. The setting of the resource will be slightly altered with the construction of the VEC, but the surrounding area is categorized as government / community facility or residential, so the construction will not dramatically alter the setting. The 2023 updated National Register nomination for the Pentagon included an increase to the district's boundary. The updated boundary incorporates the National 9/11 Pentagon Memorial into the historic district. The construction of the VEC on property adjacent to the memorial is a compatible use of the ANC licensed land. These lands were transferred to ANC from by Washington Headquarters Service, which maintains the Pentagon facilities.

The Air Force Memorial is eligible for listing on the NRHP. The proposed construction of the VEC does not diminish the memorial's ability to convey its significance or its historic integrity. The undertaking does place a new structure within the memorial's viewshed. Views of the VEC to and from the Air Force Memorial can be found in Attachment D and the VIA. The renderings show that the proposed building will be partially visible from the memorial as it looks towards the Pentagon Office Building Complex Historic District. Viewshed impacts are minimized by siting the VEC at the lowest elevation within the licensed parcel. Therefore, the Air Force Memorial will retain its significant view of the capital city, the Pentagon, and ANC. Additionally, the location and significant architectural design of the resource will be maintained. The proposed construction of the VEC will not result in irreversible changes to the Air Force Memorial and the resource will continue to convey its significance for its architecture. Therefore, will be no changes to the integrity of the identified resource's location, workmanship, feeling, associations, design, materials. While the construction of the VEC will be a new addition to the setting of the Air Force Memorial, the area surrounding the resource is

already characterized with modern buildings and infrastructure. Therefore, the proposed project will not greatly impact the integrity of the Air Force Memorial's setting.

The proposed undertaking would have **no adverse effect to archaeological resources**. All construction will be confined to the land within the APE, which has been disturbed through prior development and construction of surrounding infrastructure. It is not expected that undiscovered cultural resources would be found during construction. However, in the event of an unanticipated discovery during ground disturbing activities, all work would cease, and the ANC Cultural Resource Manager (CRM) would be contacted. The CRM would immediately notify the Virginia Department of Historic Resources and other appropriate agencies, and standard procedures would be followed to protect the artifacts and determine their significance. The license and Memorandum of Agreement (MOA) between ANMC and the PMF for construction and operation of the VEC will include the requirement for the PMF to incorporate the requirements of Stipulations V-IX from the "Memorandum of Agreement among Arlington National Cemetery, the Virginia State Historic Preservation Officer, and the Air Force District of Washington regarding the Southern Expansion Project, Arlington National Cemetery, Arlington County, Virginia," executed December 2, 2019. These stipulations focus on the unanticipated discovery and subsequent protection of historic properties found during ground disturbing operations.

The PMF and ANMC together have worked to ensure that potential effects to the surrounding historic properties have been taken into account throughout the design of the undertaking. Based on the findings of the VIA and the comments received from the VDHR and consulting parties, the PMF has committed to include interpretation that represents the history of Queen City and other historic communities connected to the project area. Also, the proposed location and siting of the VEC has been codified through the approval of the conceptual design by the CFA and NCPC. These commitments will be codified in the license and Memorandum of Agreement (MOA) between ANMC and the PMF for construction and operation of the VEC.

As such, in accordance with Section 106 of the National Historic Preservation Act of 1966 (as amended), ANMC finds that the proposed construction of the Pentagon Memorial VEC will have **no adverse effect** on the historic properties within the APE.

ANMC would like to take this opportunity to submit documentation in support of the agency's Assessment of Effect (AOE) findings for the undertaking.

ANMC transmits the following files in support of the AOE findings:

1. Attachment A: Map of Area of Potential Effects
2. Attachment B: Consulting Party List
3. Attachment C: Comments from Consulting Parties
4. Attachment D: Section 106 Process Submission: Assessment of Effects

By way of this submission, ANMC requests DHR's response to ANMC's findings of:

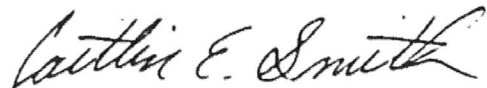
1. No adverse effects to the Arlington National Cemetery Historic District (000-0042)
2. No adverse effects to the Pentagon Office Building Complex (000-0072)
3. No adverse effects to the Air Force Memorial (000-9821)

Please provide DHR's comments on the AOE findings within thirty (30) days of receipt of this letter. All comments on the enclosed documents should be sent to the ANMC Cultural Resources Manager at usarmy.pentagon.hqda-anc-osa.mbx.cultural-resources@army.mil and Sara McLaughlin of JMT at smclaughlin@jmt.com.

Concurrent with this submission, ANMC notified consulting parties and the public of the agency's AOE findings, and of the initiation of a 30-day comment period. The notices and Section 106 documentation are posted on both the ANC and PMF websites: <https://www.arlingtoncemetery.mil/About/Policies-and-Public-Notices/Public-Notices> and <https://www.pentagonmemorial.org/public-notices/>.

Army National Military Cemeteries looks forward to continuing the Section 106 consultation process with our agency partners, consulting parties, and the public. Thank you for your support.

Sincerely,



Caitlin E. Smith
Cultural Resources Program Manager
Engineering, Planning & Resources
Army National Military Cemeteries

Attachments:

- A Map of Area of Potential Effects
- B Consulting Party List
- C Comments from Consulting Parties
- D Section 106 Process Submission: Assessment of Effects

Selected project background information:

- [PMF VEC: Section 106 Initiation Letter](#)
- [PMF VEC: Section 106 Initiation Package](#)
- [Project Overview and Scoping Boards](#)
- [Public Notice: Public/Agency Scoping Meeting, December 12, 2022](#)
- [Commission of Fine Arts Letter Approving the PM VEC Concept Design \(Sept. 27, 2023\)](#)
- [Commission of Fine Arts PM VEC Concept Design Presentation \(Sept. 21, 2023\)](#)
- [National Capital Planning Commission Letter Approving Comments on the PM VEC Concept Design \(July 6, 2023\)](#)
- [Visual Impact Assessment: Pentagon Memorial Visitor Education Center \(Updated October 2023\)](#)
- [PM VEC Consulting Party Meeting Minutes \(Sept. 6, 2023\)](#)
- [PM VEC Consulting Parties Meeting Video Recording \(Sept. 6, 2023\)](#)
- [Consulting Party Letter: Attachment B- List of Consulting Parties \(Nov. 2023\)](#)

Arlington National Military Cemetery Historic District National Register Nomination:

<https://www.dhr.virginia.gov/historic-registers/000-0042/>

Air Force Memorial Evaluation of Eligibility for the National Register of Historic Places:

<https://www.arlingtoncemetery.mil/Portals/0/Docs/Public-Notices/20190212-AFM-Draft-Determination-of-Eligibility-for-National-Register.pdf>

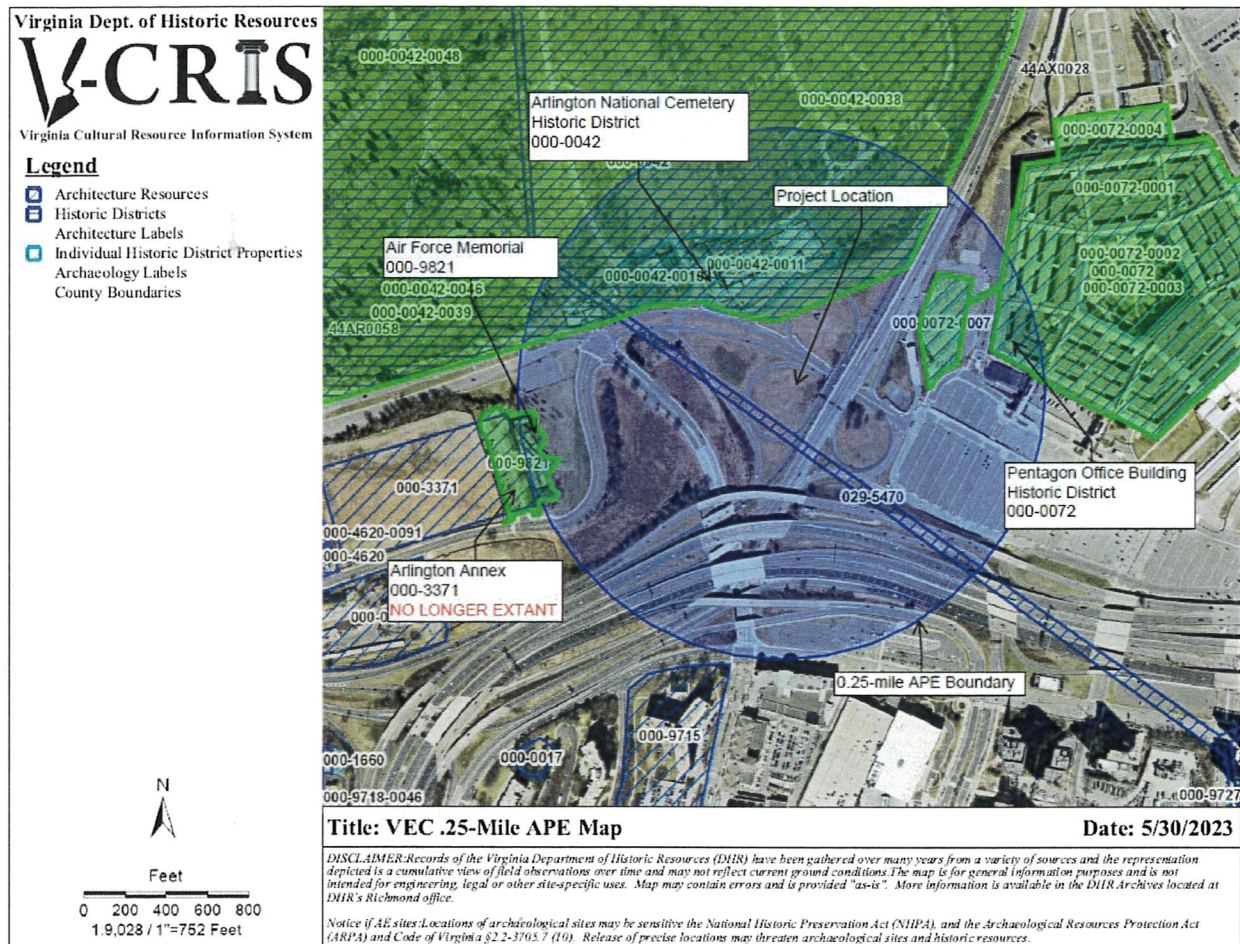
Pentagon Office Building Complex National Register Nomination:

<https://www.dhr.virginia.gov/historic-registers/000-0072/>

Information about Section 106 of the National Historic Preservation Act can be found here: <https://www.achp.gov/protecting-historic-properties>

Information about the ongoing compliance process can be found on the ANC Public Notices page of the ANC website at: <https://www.arlingtoncemetery.mil/About/Policies-and-Public-Notices/Public-Notices>

Attachment A: Map of Area of Potential Effects



Attachment B: Consulting Party List

9/11 Families United

Advisory Committee on Arlington National Cemetery

Advisory Council on Historic Preservation

Air Force Sergeants Association: Division 2

Air Force Washington District (AFDW/CC)

American Legion: General Billy Mitchell VA Post 85

American Legion: Dorie Miller VA Post 194

American Legion: VA Post 139

American Legion: VA Post 46

Arlington County Department of Environmental Services

Arlington County Historic Preservation Program

Arlington County Historical Affairs and Landmark Review Board

Arlington Historical Society

Arlington House Family Circle

Arlington Ridge Civic Association

Aurora Highlands Civic Association

Catawba Indian Nation (aka Catawba Indian Tribe of South Carolina)

Chickahominy Indian Tribe - Eastern Division

Delaware Nation, Oklahoma

Environmental Protection Agency, Region 3

Foxcroft Heights Neighborhood Association

Metropolitan Washington Council of Governments

Monacan Indian Nation

Nansemond Indian Nation

National Association of American Veterans, Inc.

National Capital Planning Commission

National Park Service

National Park Service, George Washington Memorial Parkway

National Register & National Historic Landmarks Program, National Park Service

Pamunkey Indian Tribe

Preservation Virginia

Rappahannock Tribe, Inc.

September 11th Families Association

September 11th Families for Peaceful Tomorrows

The Black Heritage Museum of Arlington

The Guild of Professional Tour Guides of Washington, DC

United States Commission of Fine Arts

Upper Mattaponi Tribe

Washington Headquarters Services

Veterans of Foreign Wars

Attachment C: Comments from Consulting Parties

First Comment Period and Public Meeting

COMMENT	RESPONSE
<p>Thanks for hosting the Section 106 meeting today, it was a very informative session. I would ask that our civic association be added to the list of invited consulting parties. You can add the email for the President of the Aurora Highlands Civic Association, president@aurorahighlands.org.</p> <p>As Pam Van Hine and I both mentioned, our neighborhood is particularly interested in the impact of vehicular traffic on our neighborhood, as well as ensuring that there are safe routes for pedestrians and cyclists. We look forward to looking at those plans as they are further refined and also participating in Arlington County's review process.</p>	<p>JMT will add the Aurora Highlands to the consulting party list and ensure the organization is involved in the Section 106 process.</p>
<p>Good morning Sara,</p> <p>Thank you so much for last night's consulting parties meeting. As I mentioned, here's more about the Black families and communities who lived on/next to the site from 1825~1944. If you need to branch into research or sources beyond these webpages, please don't hesitate to reach out. Where sources are within the NPS' scope, we'd be happy to help.</p> <ul style="list-style-type: none">• The Syphax Family (Mt Vernon)• The Syphax Family (NPS)• Freedman's Village (ANC)• Freedman's Village (NPS)• Remembering Arlington's Freedman's Village• From Freedman's Village to Queen City• Arlington History: Queen City <p>As this project proceeds, I advocate that the stories above be included in interior and exterior interpretation. This is a phenomenal opportunity to incorporate educational or memorializing content into the landscape architecture as well as on panels inside the VEC. I encourage you to confront the enslavement, displacement, and eminent domain chapters of this history. Those are the chapters many people need to hear the most and the ones that directly segue into ANC, JBMHH, and Pentagon construction.</p>	<p>PMF is committed to working with experts in the history of the Black families and communities who lived on/next to the site to incorporate interpretation of their stories into the VEC project. At this point in time, PMF is developing plans for potential types of interpretation, which could include: a plaque to commemorate the communities (location not yet determined), a panel to be included within the VEC illustrating the important histories, and/or a statue outside the VEC with a marker for explanation.</p>

<p>Hi, Sara. Doing a story on the visitor center. I know there was a meeting on Sept. 6. Are there any future public meetings, votes, dates that you can share so I can provide some specificity on next steps? Thanks.</p>	<p>A recording of the consulting party meeting will be made available online, in addition to the supporting documents detailing the project. A secondary two-week comment period will be opened in order to provide the new consulting parties an opportunity to comment, as well as for all parties to see updated documentation that was completed to respond to comments.</p>
<p>Comment regarding visual corridors: It appears there is not a cone in the map [referencing viewshed/vista map from ANC ICRMP]. Was the view looking from the Arlington House to the Mall documented in the visual impact assessment?</p>	<p>Yes, the view looking from the Arlington House to the Mall has been documented. JMT completed additional documentation in response to this comment, and the Visual Impact Assessment is being updated. Fieldwork confirmed there will be no visual impact on the character-defining viewshed from the Arlington House towards Washington, DC from the construction of the VEC. Additionally, the Arlington House will have little to no visibility of the proposed VEC as a result of the mature vegetation that characterizes the cemetery. The updated VIA will be made available as one of the supporting public documents for the second comment period.</p>
<p>Comment regarding land usage: Is this project going to consume any burial space?</p>	<p>This question was addressed during the meeting by Agnes Sullivan of ANC. ANC determined, over ten years ago, that the property was not suitable for burials by ANC. Mike McCarthy of PMF followed up to explain that planning for the VEC on this site was not initiated until ANC's determination.</p>

Follow up question to previous comment: Why is the land not suitable for burials?	This question was addressed during the meeting by Agnes Sullivan of ANC. Agnes explained that the land is not contiguous with the cemetery, as it is located on the southside of Colonial Pike.
Jeff asked for more elaboration about architectural compatibility of the proposed design, especially in terms of materiality.	This comment was addressed by Steve White during the public meeting. Steve explained the selected precast concrete was chosen to match existing materials within the cemetery, as was the VA mist, flamed granite. The glazing of the building will make the building read more opaque, like other buildings within the cemetery- many of which are not occupied. Steve also pointed out the CFA and NCPC have been involved in the design processes. The CFA approved the material palette at the hearing held on September 21, 2023.
Second question: How is parking to be handled? At the time of the Air Force Memorial, Arlington County was contentious in terms of bus parking and denied Air Force plans.	This comment was addressed by Steve White during the public meeting. Steve explained that as the layout is shown, the buses will approach the VEC from the Pentagon side on Joyce Street, turn right into the parking lot, and proceed to the loop with a visitor drop off. The drop off runs the length of the building, which allows the buses to queue. All buses would be right turn in and right turn out of the VEC parking lot.
Interested to know if there are any Veterans Associations of the consulting party list	JMT will add Veterans' associations to the consulting party list in collaboration with ANC.

<p>The redesign of the building to a lower profile and alternate siting to the NE corner—lower in elevation—is appreciated. This significantly reduces the viewshed concerns the Air Force submitted from the December 2022 workshop. However, the placement of any structure in this location will likely block the view of the middle and lower portion of the Pentagon.</p>	<p>The Visual Impact Assessment as well as architectural renderings prepared by Fentress Architects indicate the potential viewshed impacts to the Air Force Memorial will be negligible. Additionally, the conceptual project design has been reviewed and approved by both the US Commission of Fine Arts and the National Capitol Planning Commission.</p>
<p>Regarding the viewshed from the 9/11 Memorial NE corner toward the AF Memorial. Construction of the VEC at that site may also interrupt the 9/11 Memorial visitors' view of the AF Memorial in its entirety. Consider the building materials on the eastern side of the VEC with the landscape and tree canopy behind it as well as the stainless-steel spires soaring above it.</p>	<p>Selections for the materiality of the proposed VEC take into account the surrounding area and are chosen based on the compatibility with existing buildings and structures. The VIA and architectural renderings show that viewshed impacts from the 9/11 Memorial will be negligible. All selections are going through the appropriate reviews, and the design (height, mass, footprint, and materials) was approved by the US CFA at a conceptual level in their monthly meeting held on September 21, 2023.</p>
<p>In a like manner, consider the view from the AFM for the building materials on the western side of the building. You may wish to have complementary materials as they will be superimposed on the façade of the Pentagon as seen from the AFM.</p>	<p>Selections for the materiality of the proposed VEC take into account the surrounding area and are chosen based on the compatibility with existing buildings and structures. The VIA and architectural renderings show that viewshed impacts from the 9/11 Memorial will be negligible. All selections are going through the appropriate reviews, and the design (height, mass, footprint, and materials) was approved by the US CFA at a conceptual level in their monthly meeting held on September 21, 2023.</p>

<p>Please consider the reflective nature of construction materials. Any reflection from the materials used on the 9/11 VEC could be blinding to visitors at the AF Memorial looking toward the Pentagon or the DC skyline.</p>	<p>Selections for the materiality of the proposed VEC take into account the surrounding area and are chosen based on the compatibility with existing buildings and structures. The VIA and architectural renderings show that viewshed impacts from the 9/11 Memorial will be negligible. All selections are going through the appropriate reviews, and the design (height, mass, footprint, and materials) was approved by the US CFA at a conceptual level in their monthly meeting held on September 21, 2023.</p>
<p>Consider a traffic study to evaluate traffic flow on Columbia Pike and Joyce Street to determine how the addition of the new facility might impact area traffic. Bus drop off for 3 buses does not seem adequate for Honor Flight, Tour Guild or school field trip bus counts. The cumulative effect of excessive bus and private car traffic may impede traffic on Columbia Pike and the Joyce Street entrance to the ANC Operational Center. It is our experience that Honor Flights can have up to 6 buses at one time. Our main concern is the risk of impeded access due to congestion on or around the ANC Operational Center entrance, the only access point and parking garage for the AFM. Please verify the traffic flow and management of bus traffic and help ensure access to the AF Memorial parking via the Joyce Street entrance to the ANC Operations Center.</p>	<p>Comment noted. A multimodal transportation assessment (MMTA) has been prepared, which includes bus, bicycle, and pedestrian routes, travel sheds, and multimodal trip generation, to inform the transportation section of the EA. The findings of the assessment will also inform the project design. The MMTA includes multimodal trip generation estimates for the number of vehicular, bus, bicycle, pedestrian, and transit trips generated by the VEC.</p>
<p>Regarding commercial bus traffic, AFDW appreciates your consideration of COAs that provide a reasonable way of handling bus traffic on site. We highly recommend you include this capability because Air Force efforts to include a "bus lane" along Columbia Pike at the AF Memorial were not supported by Arlington County in their review of the Defense Access Road project. Additionally, given access concerns from the local "Tour Bus Guild," we recommend you reach out to that organization proactively to solicit their feedback on a bus-related solution that would enable bus traffic to visit the VEC.</p>	<p>Comment noted. JMT will reach out to the party and invite the Tour Bus Guild to participate in the Section 106 consultation.</p>

<p>Regarding your VEC dedicated parking area, we appreciate your plan to provide up to 136 parking spaces for visitors to the VEC. However, we want to emphasize that neither ANC nor the Air Force included any parking requirement for the VEC in the development of Visitor Parking adjacent to the new Pedestrian Access Point to ANC near the AF Memorial. That parking structure is not expected to have any capacity to support the VEC.</p>	<p>Comment noted. The completed MMTA included the assumption that the parking structure used by Arlington National Cemetery would not have the capacity to support the VEC. No further action required at this time.</p>
<p>Please consider food preparation aroma control. It may detract from the visitor experience at the AF Memorial, ANC burials, and visitors on foot between the 9/11 VEC and the 9/11 Memorial. Sight, sound, and smell can be impacted at the AF Memorial given the right wind/atmospheric conditions. Please consider the control of aroma as well as viewshed concerns</p>	<p>Impacts to visitors to the AF Memorial will be addressed in the EA's discussion of affected environments and potential impacts of the proposed action and alternatives considered. Because food service is proposed to be provided using pre-prepared catering and warming areas and not a full-service kitchen, the project will not have the same potential impacts as a full-service kitchen.</p>
<p>While the concept designs do not provide specific details, please consider sound attenuation impacting the surrounding environment. These would include sounds from commercial vehicles backing up on your site. Note: The design of the AF Memorial was oriented on the DC skyline and is a key contemplation feature of the Memorial. If commercial or transportation sounds are heard on a routine basis, it would interfere with the contemplative atmosphere of the AF Memorial.</p>	<p>Design team consultants to follow all applicable codes and ordinances for noise levels, mitigation, pollution, etc. Such codes and ordinances will be assessed in the EA. The loading dock is at the far end of the project site to avoid adverse effects created by sound. Activities that may generate noise over baseline levels (such as trucks with backup signals and landscaping equipment) will be scheduled to occur during hours that the Air Force Memorial and Southern Expansion Area are projected to be less active.</p>

<p>The stated purpose of the VEC is to "...support visitors of the Pentagon Memorial." You may wish to consider the opportunity to connect to visitors of the Arlington National Cemetery (ANC) Southern Expansion and the AF Memorial by adding appropriate design of crosswalks to the north side of Columbia Pike. Plans to enhance the pedestrian pathway along the realigned Columbia Pike offer you the opportunity to connect to pedestrian traffic to/from the new Pedestrian Access Point to ANC at the AF Memorial... in addition to the connection to the Pentagon.</p>	<p>Connecting visitors of the ANC Southern Expansion and AF Memorial is not a component of the Purpose and Need for the VEC as the primary purpose and need is to support visitors to the Pentagon 9/11 Memorial. Connecting visitors of the ANC Southern Expansion and AF Memorial could be considered through further consultation with ANC as an ancillary goal or mitigation measure (if applicable) for the VEC. Furthermore, crosswalks have been predetermined by the DAR project, and will connect the VEC site with the surrounding memorials. The exact locations of these connections are beyond the purview of the VEC project.</p>
<p>Consider a project to place a remembrance of the AA 77 flight path along the sidewalk along Columbia Pike where the aircraft flew over. This may be a way to connect the Pentagon, Pentagon Memorial, VEC, and the AF Memorial. Coordination with Arlington County and ANC construction may be required. This could be a community participation (in design and materials) for how to mark this on the sidewalk.</p>	<p>The PMF will explore this recommendation further as the project design progresses.</p>
<p>GWMP observed that views from Arlington House were not included in this [VIA] assessment and recommends evaluating how views from the property, particularly the east façade, will be impacted by the construction of the VEC. As the 2013 Arlington House Historic District Nomination Update notes, "The dramatic power of Arlington House derives largely from its impressive position and the views and vistas provided by its location. A primary view established during [George Washington Parke Custis] era was from the front of the house looking east towards the expanse of Washington, D.C." Given that this particular view is a key component of the historic landscape, it is important to understand what, if any, visual impacts will be introduced by new construction.</p>	<p>Yes, the view looking from the Arlington House to the Mall has been documented. JMT completed additional documentation in response to this comment, and the Visual Impact Assessment is being updated. Fieldwork confirmed there will be no visual impact on the character-defining viewshed from the Arlington House towards Washington, DC from the construction of the VEC. Additionally, the Arlington House will have little to no visibility of the proposed VEC as a result of the mature vegetation that characterizes the cemetery. The</p>

	updated VIA will be made available as one of the supporting public documents for the second comment period.
As ANMC and PMF develop the interpretive material for the proposed Visitor Education Center, GWMP advocates for the inclusion of information about the Black families and communities who lived on or near the proposed site from 1925 until ca. 1944. This is a phenomenal opportunity to incorporate education or memorializing content into the exterior and interior of the VEC, content that confronts the enslavement, displacement and eminent domain chapters of this area's history. We have identified some relevant materials that may be of assistance while thinking through the interpretive elements of the VEC. Where areas are within our scope, GWMP would be happy to assist in providing research and other materials. SEE ATTACHMENTS.	PMF is committed to working with experts in the history of the Black families and communities who lived on/next to the site to incorporate interpretation of their stories into the VEC project. At this point in time, PMF is developing plans for potential types of interpretation, which could include: a plaque to commemorate the communities (location not yet determined), a panel to be included within the VEC illustrating the important histories, and/or a statue outside the VEC with a marker for explanation.

Second Comment Period

COMMENT	RESPONSE
<p>The redesign of the building to a lower profile and alternate siting to the NE corner—lower in elevation—is appreciated. This significantly reduces the viewshed concerns the Air Force submitted from the December 2022 workshop. However, the placement of any structure in this location will likely block the view of the middle and lower portion of the Pentagon. At the present, there is an inhibited view of the Pentagon. We would appreciate continuing to preserve the view of the annual 9/11 Remembrance, specifically, the U.S flag on the side of the Pentagon Building extending to the middle of the building.</p>	<p>Please refer to Slide 49 (Perspective from Air Force Memorial) Conceptual Design presentation given to the Commission of Fine Arts on September 21st, 2023. This perspective illustrates the visibility of the proposed VEC from the Air Force Memorial. As shown, the design will have little to no effect on the Air Force Memorial's view towards the Pentagon. The conceptual project design has been reviewed and approved by both the US Commission of Fine Arts and the National Capitol Planning Commission.</p>
<p>Regarding the viewshed from the 9/11 Memorial NE corner toward the AF Memorial; construction of the VEC at that site may also interrupt the 9/11 Memorial visitors view of the AF Memorial in its entirety.</p>	<p>The view from the NE corner of the 9/11 Memorial looking towards the Air Force Memorial is characterized by dense vegetation which partially obscures the visibility of the Air Force Memorial. The construction will not impact the 9/11 Memorial's visibility towards the Air Force Memorial. The topography of the areas in question will also ensure the Air Force Memorial's continued visibility of the 9/11 Memorial. Additionally, the conceptual project design has been reviewed and approved by both the US Commission of Fine Arts and the National Capitol Planning Commission.</p>
<p>Regarding the viewshed from the 9/11 Memorial to the AF Memorial, consider the building materials on the eastern side of the VEC with the landscape and tree canopy behind it as well as the AFM stainless-steel spires soaring above it in the distance. In a like manner, consider the view from the AFM for the building materials on the western side of the building. You may wish to have complementary materials as</p>	<p>Selections for the materiality of the proposed VEC take into account the surrounding area and are chosen based on the compatibility with existing buildings and structures. The VIA and architectural renderings show that viewshed impacts from the 9/11</p>

<p>they will be superimposed on the facade of the Pentagon as seen from the AFM.</p>	<p>Memorial will be negligible. All selections are going through the appropriate reviews, and the design (height, mass, footprint, and materials) was approved by the US CFA at a conceptual level in their monthly meeting held on September 21, 2023.</p>
<p>Please consider the reflective nature of construction materials. Any reflection from the materials used on the 9/11 VEC could be blinding to visitors at the AF Memorial looking toward the Pentagon or the DC skyline.</p>	<p>Selections for the materiality of the proposed VEC take into account the surrounding area and are chosen based on the compatibility with existing buildings and structures. The VIA and architectural renderings show that viewshed impacts from the 9/11 Memorial will be negligible. All selections are going through the appropriate reviews, and the design (height, mass, footprint, and materials) was approved by the US CFA at a conceptual level in their monthly meeting held on September 21, 2023.</p>
<p>Consider a traffic study to evaluate traffic flow on Columbia Pike and Joyce Street to determine how the addition of the new facility might impact area traffic. Bus drop off for 3 buses does not seem adequate for Honor Flight, Tour Guild or school field trip bus counts. The cumulative effect of excessive bus and private car traffic may impede traffic on Columbia Pike and the Joyce Street entrance to the ANC Operational Center. It is our experience that Honor Flights can have up to 6 buses at one time. Our main concern is the risk of impeded access due to congestion on or around the ANC Operational Center entrance, the only access point and parking garage for the AFM. Please verify the traffic flow and management of bus traffic and help ensure access to the AF Memorial parking via the Joyce Street entrance to the ANC Operations Center.</p>	<p>Comment noted. A multimodal transportation assessment (MMTA) has been prepared, which includes bus, bicycle, and pedestrian routes, travel sheds, and multimodal trip generation, to inform the transportation section of the EA. The findings of the assessment will also inform the project design. The MMTA includes multimodal trip generation estimates for the number of vehicular, bus, bicycle, pedestrian, and transit trips generated by the VEC.</p>
<p>Regarding commercial bus traffic, AFDW appreciates your consideration of COAs that provide a reasonable way of handling bus traffic on site. We highly recommend you include this capability because Air</p>	<p>Comment noted.</p>

<p>Force efforts to include a “bus lane” along Columbia Pike at the AF Memorial were not supported by Arlington County in their review of the Defense Access Road project.</p>	
<p>Regarding your VEC dedicated parking area, we appreciate your plan to provide up to 136 parking spaces for visitors to the VEC. However, we want to emphasize that neither ANC nor the Air Force included any parking requirement for the VEC in the development of Visitor Parking adjacent to the new Pedestrian Access Point to ANC near the AF Memorial. That parking structure is not expected to have any capacity to support the VEC.</p>	<p>Comment noted. The completed MMTA included the assumption that the parking structure used by Arlington National Cemetery would not have the capacity to support the VEC. No further action required at this time.</p>
<p>Please consider food preparation aroma control. It may detract from the visitor experience at the AF Memorial, ANC burials, and visitors on foot between the 9/11 VEC and the 9/11 Memorial. Sight, sound, and smell can be impacted at the AF Memorial given the right wind/atmospheric conditions. Please consider the control of aroma as well as viewshed concerns</p>	<p>Impacts to visitors to the AF Memorial will be addressed in the EA's discussion of affected environments and potential impacts of the proposed action and alternatives considered. Because food service is proposed to be provided using pre-prepared catering and warming areas and not a full-service kitchen, the project will not have the same potential impacts as a full-service kitchen.</p>
<p>While the concept designs do not provide specific details, please consider sound attenuation impacting the surrounding environment. These would include sounds from commercial vehicles backing up on your site. Note: The design of the AF Memorial was oriented on the DC skyline and is a key contemplation feature of the Memorial. If commercial or transportation sounds are heard on a routine basis, it would interfere with the contemplative atmosphere of the AF Memorial.</p>	<p>Design team consultants to follow all applicable codes and ordinances for noise levels, mitigation, pollution, etc. Such codes and ordinances will be assessed in the EA. The loading dock is at the far end of the project site to avoid adverse effects created by sound. Activities that may generate noise over baseline levels (such as trucks with backup signals and landscaping equipment) will be scheduled to occur during hours that the Air Force Memorial and Southern Expansion Area are projected to be less active.</p>

<p>The stated purpose of the VEC is to "...support visitors of the Pentagon Memorial." You may wish to consider the opportunity to connect to visitors of the Arlington National Cemetery (ANC) Southern Expansion and the AF Memorial by adding appropriate design of crosswalks to the north side of Columbia Pike. Plans to enhance the pedestrian pathway along the realigned Columbia Pike offer you the opportunity to connect to pedestrian traffic to/from the new Pedestrian Access Point to ANC at the AF Memorial... in addition to the connection to the Pentagon.</p>	<p>Connecting visitors of the ANC Southern Expansion and AF Memorial is not a component of the Purpose and Need for the VEC as the primary purpose and need is to support visitors to the Pentagon 9/11 Memorial. Connecting visitors of the ANC Southern Expansion and AF Memorial could be considered through further consultation with ANC as an ancillary goal or mitigation measure (if applicable) for the VEC. Furthermore, crosswalks have been predetermined by the DAR project, and will connect the VEC site with the surrounding memorials. The exact locations of these connections are beyond the purview of the VEC project.</p>
<p>Consider a project to place a remembrance of the AA 77 flight path along the sidewalk along Columbia Pike where the aircraft flew over. This may be a way to connect the Pentagon, Pentagon Memorial, VEC, and the AF Memorial. Coordination with Arlington County and ANC construction may be required. This could be a community participation (in design and materials) for how to mark this on the sidewalk.</p>	<p>The PMF will explore this recommendation further as the project design progresses.</p>
<p>Thank you for the opportunity to comment again on the project. DEQ does not wish to be a consulting party for the Section 106 consultation. Please refer to our previous correspondence attached regarding the coordination of the NEPA and federal consistency documents.</p>	<p>JMT will remove Virginia DEQ from the Section 106 consulting party list.</p>
<p>"Thank you for requesting comments from the Department of Historic Resources (DHR) on the referenced project, Pentagon Memorial Fund Visitor Education Center (DHR File No. 2023-4078). We understand that Army National Military Cemeteries (ANMC) feels that the appropriate way to proceed with the Section 106 consultation is to reopen the comment period for additional consulting parties and to provide all parties with the opportunity to review new information in response to comments received. The comments, received in response to the Section 106</p>	<p>No further comments, concurrence noted.</p>

<p>Initiation letter dated June 27, 2023, requested additional information on the massing and height of the proposed building, along with its location on the site. Since these comments were received, the proposed conceptual design and site plan for the Visitor Education Center has been reviewed and approved by the Commission of Fine Arts and National Capital Planning Commission. DHR has reviewed the area of potential effects and identification of historic properties and concur with ANMC's determinations on both."</p>	
--	--



COMMONWEALTH of VIRGINIA

Travis A. Voyles
Secretary of Natural and
Historic Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director
Tel: (804) 367-2323
Fax: (804) 367-2391
www.dhr.virginia.gov

May 1, 2024

Caitlin Smith
1 Memorial Ave
Arlington, VA 22211

Re: Pentagon Memorial Fund Visitor Education Center
Arlington, Virginia.
DHR Project No. 2023-4078

Dear Ms. Smith

Thank you for requesting comments from the Department of Historic Resources (DHR) on the referenced project, Pentagon Memorial Fund Visitor Education Center (DHR File No. 2023-4078).

Army National Military Cemeteries (ANMC) has determined that this undertaking, the construction and operation of a Pentagon Memorial Fund Visitor Education Center (VEC), will result in no adverse effects to the historic properties within the undertaking's area of potential effects (Arlington National Cemetery Historic District (DHR ID #000-0042), Pentagon Office Building Complex (DHR ID #000-0072) and Air Force Memorial (DHR ID #000-9821)), and DHR concurs.

Implementation of the undertaking in accordance with the finding of **No Adverse Effects** as documented fulfills the Federal agency's responsibilities under Section 106 of the National Historic Preservation Act. If for any reason the undertaking is not or cannot be conducted as proposed in the finding, consultation under Section 106 must be reopened. Additionally, DHR requests a full set of photographs of the work once completed for our files.

If you have any questions at this time, please do not hesitate to contact me at jennifer.bellville-marrion@dhr.virginia.gov.

Sincerely,

A handwritten signature in blue ink, appearing to read "Jenny Bellville-Marrion".

Jenny Bellville-Marrion, Project Review Archaeologist
Review and Compliance Division

Cc:
Sara McLaughlin, JMT

Western Region Office
962 Kime Lane
Salem, VA 24153
Tel: (540) 387-5443
Fax: (540) 387-5446

Northern Region Office
5357 Main Street
PO Box 519
Stephens City, VA 22655
Tel: (540) 868-7029
Fax: (540) 868-7033

Eastern Region Office
2801 Kensington Avenue
Richmond, VA 23221
Tel: (804) 367-2323
Fax: (804) 367-2391

Appendix G

Multimodal Transportation Assessment

Multimodal Transportation Assessment

Pentagon Memorial Visitor Education Center

Arlington, Virginia

July 11, 2023

DRAFT

GOROVE SLADE
Transportation Planners and Engineers

Prepared by:
GOROVE SLADE
Transportation Planners and Engineers

4114 Legato Road

Suite 650

Fairfax, VA 22033

T 703.787.9595

225 Reinekers Lane

Suite 750

Alexandria, VA 22314

T 703.721.3044

1140 Connecticut Ave NW

Suite 1010

Washington, DC 20036

T 202.296.8625

4951 Lake Brook Drive

Suite 250

Glen Allen, VA 23060

T 804.362.0578

www.groveslade.com

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Executive Summary

The following report is a Multimodal Transportation Assessment (MMTA) for the proposed Pentagon Memorial Visitor Education Center in Arlington, Virginia.

Site Location and Study Area

The proposed development site is located north of the Pentagon City area of Arlington, Virginia. The Federal Highway Administration is undertaking a Defense Access Roads project (hereafter referred to as the “DAR project”) which will realign the eastern end of Columbia Pike in the study area, modify its intersection with S Joyce Street and its interchange with Washington Boulevard (VA Route 27) near the Pentagon, and replace Southgate Road with a new S Nash Street alignment. The reconfiguration of these roadways will accommodate the Arlington National Cemetery Southern Expansion (ANCSE) project and will create the site for the Visitor Education Center.

The project site will be bounded by the realigned Columbia Pike to the north, S Joyce Street to the west, and Washington Boulevard to the east and south as shown in Figure 2. The general extents of the study area are Columbia Pike to the north, Army Navy Drive to the south, S Hayes Street to the east, and the Washington Boulevard Off Ramp at Columbia Pike and S Orme Street to the west.

The vehicular study area consists of nine (9) intersections along Columbia Pike, Washington Boulevard, S Joyce Street, and Army Navy Drive as vetted and approved by Arlington County.

The site is currently zoned S-3A and is shown as Public in the General Land Use Plan (GLUP).

Proposed Project

The proposed development will construct a Visitor Education Center to educate and remember the events of September 11, 2001 at the Pentagon and provide logistical support for the existing 9/11 Pentagon Memorial. The 9/11 Pentagon Memorial is located northeast of the proposed site near the Pentagon. The proposed building will house an exhibit gallery that educates visitors on the events surrounding 9/11. A multi-purpose conference center and education space is also proposed within the same building, which will be used for both daytime conferences/meetings and evening special events. The building will be approximately 50,000 gross square feet in size over two floors. The exhibit space is approximately 15,000 square feet with ancillary support spaces and the Conference Center is

approximately 5,200 square feet with pre-function and ancillary support spaces. A site plan is shown in Figure 6 .

The proposed development will provide approximately 100 parking spaces in an on-site surface parking lot. Vehicular access to the site will be provided via two driveways: one on Columbia Pike and one on S Joyce Street. In the current version of the site plan, both of these driveways are designed to be right-in/right-out only. The project team is currently studying the feasibility of an alternative configuration of the S Joyce Street driveway, in which a median break would be provided on S Joyce Street to permit southbound left turns into the site. Loading space will be provided to accommodate the practical needs of the development and is located south of the building. A layout of the parking spaces, loading, and circulation pattern are shown in Figure 13.

Policies and Goals

The Arlington County Master Transportation Plan (MTP), adopted in 2011 and updated in 2019, outlines goals to improve various modes of transportation throughout the County. Similarly, the Pentagon City Sector Plan, which was approved in February 2022, and its accompanying transportation analysis, identifies potential improvements to the multi-modal transportation system to better accommodate additional trips generated by future redevelopment. Although the Pentagon Memorial Visitor Education Center is located north of I-395, just outside of the Sector Plan’s extents, this development achieves several of the goals and policies of the MTP and the Sector Plan.

Multi-Modal Overview

Transit

The subject site is well-served by transit:

- The site is located 0.5 miles from the Pentagon City Metro Station and 0.7 miles from the Pentagon Metro Station which are served by the Blue and Yellow lines.
- There are six (6) bus stops within a quarter-mile of the site. These stops are directly served by WMATA (Metrobus) and Arlington Transit (ART).
- The Pentagon City Metro is served by several bus routes provided by WMATA (Metrobus), ART, and other regional bus routes.
- Future planned transit improvements in the vicinity of the site include the Transitway Extension to Pentagon City. This will further improve transit access by providing additional facilities and connectivity via Metroway.

Additionally, planned improvements along the Columbia Pike transit corridor will improve multi-modal connectivity to the site with enhanced transit amenities and changes to service.

Bicycle

The site has access to several on-street bicycle facilities, including bike lanes on Army Navy Drive, S Joyce Street, and S Hayes Street with signed routes located along Southgate Road and a trail that intersects Washington Boulevard. Furthermore, additional protected bicycle lanes are located in Pentagon City on portions of S Eads Street south of 15th Street S, and signed routes along 12th Street S and S Fern Street S. These, in turn, provide regional access to destinations within Virginia and the District.

Existing bike facilities have been recommended by the Arlington Master Transportation Plan Bicycle Element to be upgraded in the future. The plan makes the following recommendations for roadways in the vicinity of the site:

- Implement wide multi-use trails and or wide sidewalks, along a minimum of one side of Columbia Pike. The extents of this improvement area east S Wayne Street and west of Four Mile Run. These improvements will be implemented in conjunction with other streetscape improvements and the east end realignment of Columbia Pike.
- Construct a trail parallel to the east wall of Arlington Cemetery to link Columbia Pike to Memorial Drive. Connecting the trail installation with the reconfiguration of the east end of Columbia Pike.
- Reconstruct Army Navy Drive to include bi-directional, protected bicycle lanes from S Joyce Street to 12th Street S.
- Construct an off-street cycle track connecting the planned Army Navy Drive protected bicycle lane at 12th Street S to 18th Street S and the Crystal City Metrorail station
- Upgrade the existing bicycle lanes on S Joyce Street and 15th Street S between Army Navy Drive and S Hayes Street to include more separation from motor vehicle traffic.

The proposed development will provide on-site short-term bicycle parking. As part of the DAR project, an off-street cycle track will be constructed on the north side of Columbia Pike between Washington Boulevard and S Nash Street. The eastern end of this facility will connect users to the Washington Boulevard Sidepath and the future Arlington National Cemetery Wall Trail.

Pedestrian

Pedestrian facilities around the site provide an adequate walking environment. There are sidewalks along the majority of primary routes to pedestrian destinations with few gaps in the system. I-395 and Washington Boulevard to the south and east of the site are barriers to pedestrian connectivity.

Pedestrian improvements being implemented as part of the DAR project will provide a more inviting pedestrian environment by adding new sidewalks and streetscape features along the site's frontages that meet or exceed Arlington County requirements.

Vehicular

The site is accessible from several principal arterials such as VA-27 (Washington Boulevard) and VA-244 (Columbia Pike). The arterials create connections to I-395, I-66, George Washington Memorial Parkway, and ultimately the Capital Beltway (I-495) and I-95. These roadways bring vehicular traffic within half-mile of the site, at which point arterials, collectors, and local roads (namely, Columbia Pike and S Joyce Street) can be used to access the site directly.

Existing Conditions

Intersection capacity analyses were performed for the morning and afternoon peak hours at study area intersections. Synchro version 11 was used to analyze the study intersections based on the *Highway Capacity Manual* (HCM) 2000 methodology.

The existing conditions analysis shows that many intersections and movements operate at an acceptable level of service during the morning and afternoon peak hours. However, four (4) study intersections have one or more movements that operate at levels beyond Level of Service (LOS) E or better in one or more peak hour. LOS E is typically used as the acceptable LOS threshold in the County; although LOS F is generally accepted in urbanized areas if vehicular improvements would be a detriment to safety or to non-auto modes of transportation. The capacity analysis results also show that four (4) intersections have 95th percentile queues that exceed the available storage length in one or more peak hour in existing conditions.

Travel Demand Assumptions

Weekday peak hour trip generation is calculated based on a developed methodology that references attendance projections at the visitor education center space and the multi-purpose conference center space. The trip generation developed using this methodology was compared to a more traditional trip generation using methodology outlined in the Institute of

Transportation Engineers' (ITE) Trip Generation, 11th Edition. The ITE-based methodology resulted in fewer estimated peak hour trips generated by the proposed development, largely because the proposed development includes unique land uses that are not accounted for in the ITE manual. In order to provide a conservative analysis, the methodology based on projected attendance was used.

Mode split (also called mode share) is the percentage of travelers using a particular type (or mode) of transportation when traveling. The main source of mode split information for this report was based on visitation projections developed by the project team, Census data using Transportation Analysis Districts (TADs), the Crystal City Multimodal Transportation Study, the WMATA Ridership Survey, and Arlington County mode share guidance for Pentagon City. The mode splits shown below were assumed in the analysis, as vetted and approved by Arlington County:

- Visitor Center Attendees – Tour Groups
 - Auto – 0%, Transit – 0%, Bike – 0%, Walk – 0%, Other (Private Tour Bus/Shuttle Bus) – 100%
- Non-Group Visitor Center Attendees (Residents)
 - Auto – 60%, Transit – 25%, Bike – 0%, Walk – 0%, Other (Private Tour Bus/Shuttle Bus) – 15%
- Non-Group Visitor Center Attendees (Tourists)
 - Auto – 65%, Transit – 30%, Bike – 1%, Walk – 4%, Other (Private Tour Bus/Shuttle Bus) – 0%
- Event and Facility Rental Attendees (Daytime Events)
 - Auto – 65%, Transit – 30%, Bike – 1%, Walk – 4%, Other (Private Tour Bus/Shuttle Bus) – 0%
- Event and Facility Rental Attendees (Nighttime Events)
 - Auto – 65%, Transit – 30%, Bike – 1%, Walk – 4%, Other (Private Tour Bus/Shuttle Bus) – 0%
- Staff/Employees
 - Auto – 30%, Transit – 61%, Bike – 3%, Walk – 6%, Other (Private Tour Bus/Shuttle Bus) – 0%

Future Improvements

A number of planned transportation improvements in the vicinity of the Pentagon Memorial Visitor Education Center are expected to be complete by 2027. The full list of improvements is detailed in the report, but examples include:

- Arlington National Cemetery Southern Expansion (ANCSE)
- Defense Access Roads (DAR) Project
- Columbia Pike Multimodal Street Improvements
- Army Navy Drive Complete Street
- Transitway Extension to Pentagon City

Future Traffic Operations

A capacity analysis was developed to compare the future roadway network without the proposed development to the future roadway network with the proposed development. Two (2) scenarios were studied for the proposed development: one in which the site driveway on S Joyce Street is right-in/right-out only, and one in which the same driveway is left-in/right-in/right-out only. Intersection capacity analyses were performed for the morning and afternoon peak hours at study area intersections. Synchro version 11 was used to analyze the study intersections based on the *Highway Capacity Manual* (HCM) 2000 methodology.

Traffic projections for 2027 are based on existing volumes plus inherent growth on the roadway (representing regional traffic growth) and traffic generated by approved nearby background developments expected to be completed prior to 2027 (representing local traffic growth). The methodology of using an inherent growth rate to account for regional growth and background development trips to account for local growth is consistent with other MMTAs in Arlington County and has been vetted and approved by the County.

Mitigations

Mitigation measures were identified based on Arlington County standards and as outlined in the approved scoping document (contained in the Technical Appendix). The proposed development is considered to have an impact at an intersection if any of the following conditions are met:

- The overall intersection or any movement operates at LOS F in the future conditions with the proposed development where it operates at LOS E or better in the background conditions without the proposed development;
- The overall intersection or any movement operates at LOS F during the background condition and the delay increases by more than 10% in the future conditions with the proposed development; or
- If any 95th percentile queue length in the future condition exceeds the available capacity where it does not in the background conditions or increases the 95th percentile queue length by more than 150 feet where is already exceeds the available capacity in the background conditions.
- The proposed development's close proximity to the Pentagon City Metro Station, Pentagon Metro Station, and multiple bus lines.
- Improvements to the pedestrian facilities adjacent to the site that meet or exceed Arlington County and ADA requirements.
- The installation of short-term bicycle parking spaces on site.
- The provision of a bus pick-up/drop-off zone and bus layover zone to accommodate private tour buses and shuttles on site.
- Limited on-site parking, which will promote the use of non-auto modes of travel to and from the proposed development.
- A Transportation Management Plan (TMP) framework that aims to reduce the demand of single-occupancy, private vehicles to/from the proposed development during peak period travel times.

Following these guidelines, mitigation measures were explored and included the following recommendation(s) for both 2027 Future Conditions (Right-In/Right-Out Only Access on S Joyce Street and Left-In/Right-In/Right-Out Only Access on S Joyce Street):

- Adjustments to signal timings at one (1) intersection: Army Navy Drive & S Hayes Street

With these mitigations in place, the analysis shows that traffic operations with the proposed development will improve or are consistent with the Background scenario at many intersections.

Transportation Management Plan Framework

Promoting the utilization of transit, walking, bicycling and carpooling will help maximize the efficient use of the transportation facilities on site. A TMP framework is included in this report which outlines the transportation demand management (TDM) measures proposed to be implemented with the development, including a plan to manage passenger loading/unloading, circulation, and parking for tour buses and private shuttles.

Summary and Recommendations

This report concludes that the proposed development will not have a detrimental impact to the surrounding transportation and roadway network, assuming that all planned site design elements and recommended mitigation measures are implemented.

The development has many positive elements contained within its design that minimize potential transportation impacts, including:

Introduction

This report presents the findings of a Multimodal Transportation Assessment (MMTA) conducted for the proposed Pentagon Memorial Visitor Education Center development in Arlington, VA.

The Federal Highway Administration (FHWA) is undertaking a Defense Access Roads project (referred to as the “DAR project”) which will realign the eastern end of Columbia Pike in the study area, modify its intersection with S Joyce Street and its interchange with Washington Boulevard (VA Route 27) near the Pentagon, and replace Southgate Road with a new S Nash Street alignment. The reconfiguration of these roadways will accommodate the Arlington National Cemetery Southern Expansion (ANCSE) and will create the site for the Visitor Education Center.

The proposed development will construct a Visitor Education Center to educate and remember the events of September 11, 2001 at the Pentagon and provide logistical support for the existing 9/11 Pentagon Memorial. The 9/11 Pentagon Memorial is located northeast of the proposed site near the Pentagon. The proposed building will house an exhibit gallery that educates visitors on the events surrounding 9/11. A multi-purpose conference center and education space is also proposed within the same building, which will be used for both daytime conferences/meetings and evening special events. The building will be approximately 50,000 gross square feet in size over two floors. The exhibit space is approximately 15,000 square feet with ancillary support spaces and the Conference Center is approximately 5,200 square feet with pre-function and ancillary support spaces.

The site is currently zoned as S-3A and is shown as Public in the General Land Use Plan (GLUP).

Purpose of Study

The purpose of this study is to evaluate the transportation network in the vicinity of the site and identify any potential transportation impacts that may result from the proposed redevelopment. Elements of this report include a description of the proposed development, an evaluation of the existing multimodal transportation network, and evaluations of the future transportation network with and without the proposed development.

Study Tasks

The following tasks were completed as part of this study:

- A scoping form dated May 19, 2023 was submitted by Gorove Slade to Arlington County and accepted on May 22, 2023. This scope includes discussions about the parameters of the study and relevant background information. A copy of the signed scoping document is included in the Technical Appendix.
- At the time this study was prepared, construction on the DAR project was underway and closed several roads in the study area. As a result, traffic volumes at many of the study intersections were not representative of typical traffic conditions. New data from two intersections unaffected by the DAR construction were compared to historical (2019) count data. The comparison found that 2019 traffic volumes were higher than current (2022 and 2023) volumes. Therefore, for purposes of a conservative analysis and to accurately model conditions prior to the commencement of the DAR construction, 2019 volumes were used as the basis for the Existing analysis.
- As outlined in the scoping document, a number of proposed developments in the vicinity of the site were assumed to be in place for the Background (2027) and Future (2027) Conditions.
- Proposed site traffic volumes were generated based on the projected number of visitor center attendees per day, the projected number of conference center and special events attendees, and the projected number of employees and PMVEC staff. Traditional trip generation using the Institute of Transportation Engineers’ Trip Generation was not used as no comparable land use is included in the manual.
- Intersection capacity analyses were performed using the software package Synchro, Version 11 based on the Highway Capacity Manual (HCM) methodology. Traffic analyses were performed for existing conditions (2022), future conditions (2027) without development, and two scenarios for future conditions (2027) with development: one scenario in which the site driveway on S Joyce Street is right-in/right-out only, and one in which the same driveway is left-in/right-in/right-out only.
- A Transportation Management Plan framework was developed that aims to reduce the demand for single-occupancy vehicle trips.

Project Summary

Site Location

The project site is located in the Pentagon City area of Arlington, Virginia. Figure 1 shows the regional location of the project. The project site will be bounded by the realigned Columbia Pike to

the north, S Joyce Street to the west, and Washington Boulevard to the east and south as shown in Figure 2.

Parcel Information

The development site is currently occupied by two ramps connecting eastbound Columbia Pike to southbound Washington Boulevard (Route 27); these ramps will reconfigured as part of the DAR project, creating the site for the proposed development. A parcel map showing the location of the property is presented in Figure 3.

General Land Use Plan Recommendations

According to Arlington County's General Land Use Plan (GLUP), this site is listed as Public land use. The GLUP map for the site is shown in Figure 4. The site is currently zoned S-3A: Special District. The zoning map is shown in Figure 5.

Proposed Site Plan

The proposed development will develop the site with a visitor education center and multi-purpose conference center space in one building. The proposed building will house an exhibit gallery that educates visitors on the events surrounding 9/11. A multi-purpose conference center and education space is also proposed within the same building, which will be used for both daytime conferences/meetings and evening special events. The building will be approximately 50,000 gross square feet in size over two floors. The proposed development will provide approximately 100 parking spaces in an on-site surface parking lot. Access to the site will be provided via driveways on Columbia Pike and S Joyce Street. Loading space will be provided to accommodate the practical needs of the development and is located on the south side of the building. The proposed site plan is shown in Figure 6.

Scope and Limits of the Study Area

The study area is generally bounded by the future alignment of S Nash Street to the west, Washington Boulevard SB Ramps to the east, Columbia Pike to the north, and Army Navy Drive to the south.

The following intersections were identified for inclusion in the vehicular study area, as shown in Figure 7.

1. Columbia Pike and Washington Boulevard Off Ramp/S Orme Street
2. Columbia Pike and S Nash Street
3. Columbia Pike and Air Force Memorial Drive
4. Columbia Pike and S Joyce Street

5. Columbia Pike and Site Driveway
6. S Joyce Street and Washington Boulevard SB Ramps
7. Army Navy Drive and Site Driveway
8. Army Navy Drive and S Joyce Street
9. Army Navy Drive and S Hayes Street

Data Sources

Sources of data for this study include Arlington County, the Virginia Department of Transportation (VDOT), Census Transportation Planning Products (CTPP), MGAC, Fentress Architects, Walter Philips, and the office files and field reconnaissance efforts of Gorove Slade Associates, Inc.

Contents of Study

This report contains 10 chapters as follows:

- Study Area Overview
This chapter reviews the area near and adjacent to the project and includes an overview of the site location.
- Transit
This chapter summarizes the existing and future transit service adjacent to the site, reviews how the project's transit demand will be accommodated, outlines impacts, and presents recommendations as needed.
- Pedestrian Facilities
This chapter summarizes existing and future pedestrian access to the site, reviews walking routes to and from the project site, outlines impacts, and presents recommendations as needed.
- Bicycle Facilities
This chapter summarizes existing and future bicycle access to the site, reviews the quality of cycling routes to and from the project site, outlines impacts, and presents recommendations as needed.
- Project Design
This chapter reviews the transportation components of the project, including the site plan and access.
- Travel Demand Assumptions
This chapter outlines the travel demand of the proposed project. It summarizes the expected mode splits and multimodal trip generation of the project.
- Traffic Operations
This chapter provides a summary of the existing roadway facilities and an analysis of the existing and future roadway capacity in the study area. It summarizes the routing assumptions used in the analysis. This chapter highlights the vehicular impacts of the project, including

presenting mitigation measures for minimizing impacts as needed.

- Safety Review
This chapter reviews the findings of a crash data analysis of adjacent intersections and frontage of the proposed project.
- Transportation Management Plan Framework
This chapter outlines a Transportation Management Plan framework, which identifies proposed measures to encourage the use of transit, walking, bicycling, and carpooling.
- Summary and Conclusions
This chapter presents a summary of the recommended mitigation measures by mode and presents overall findings and conclusions.

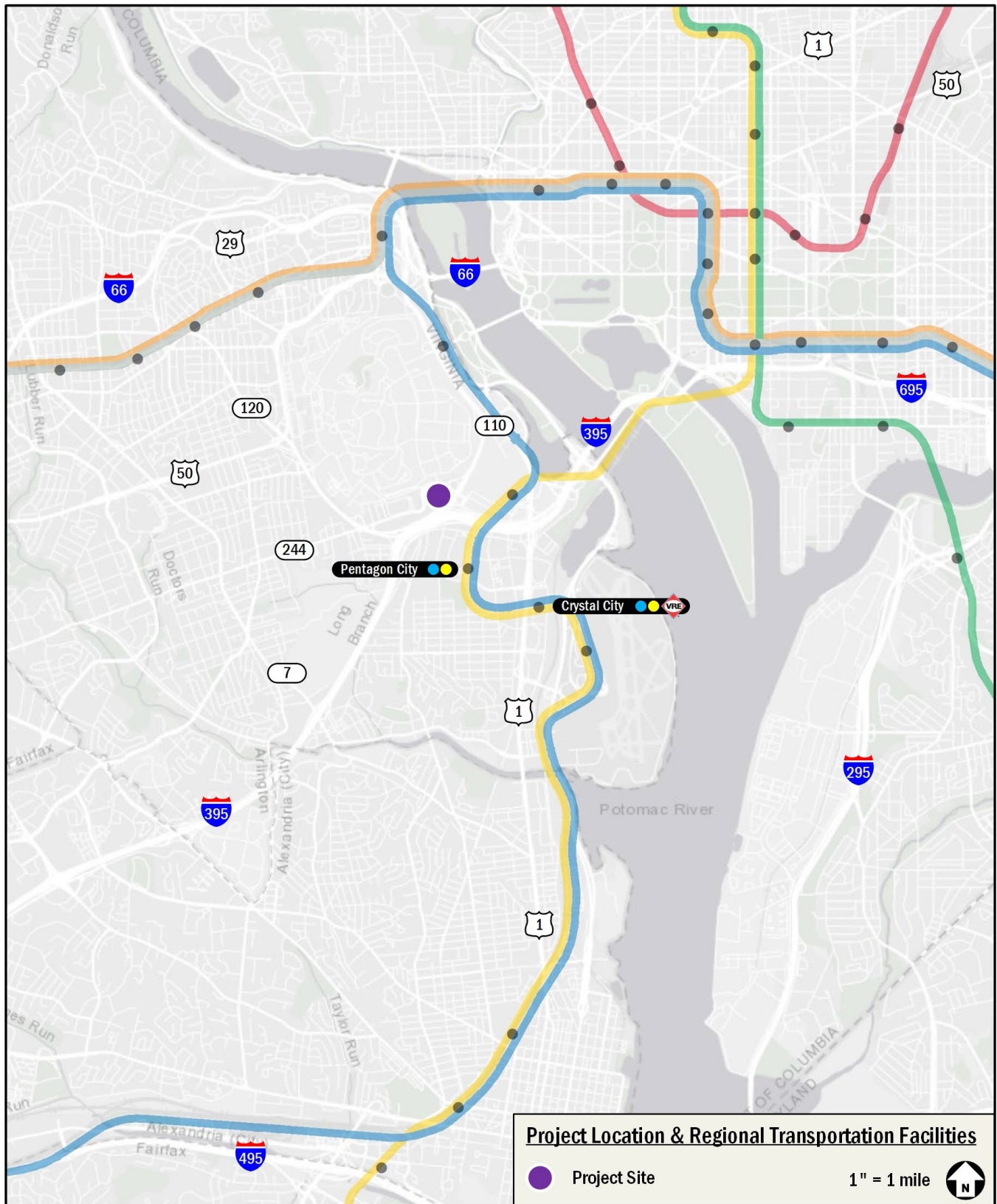


Figure 1: Major Regional Transportation Facilities

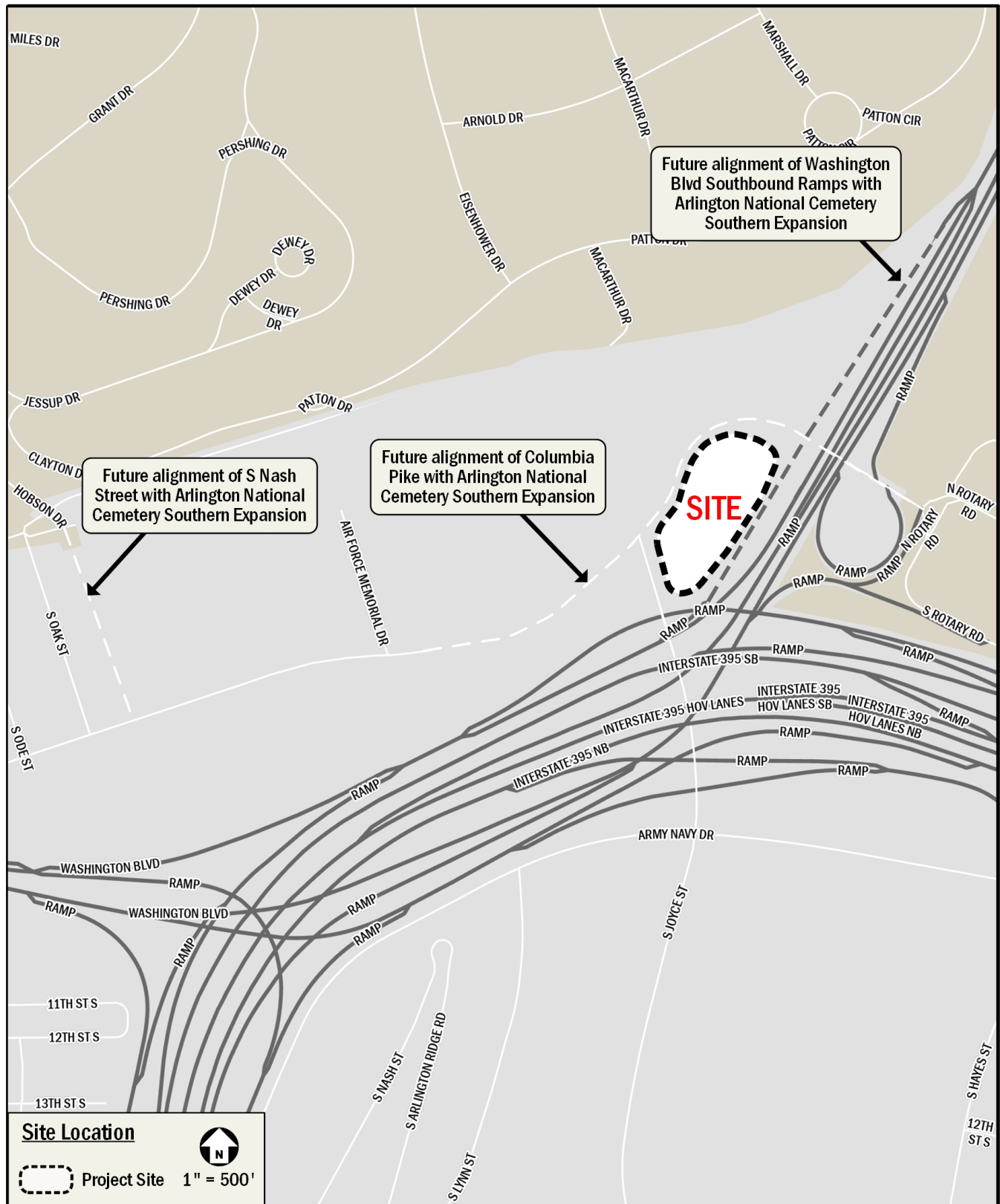


Figure 2: Site Location

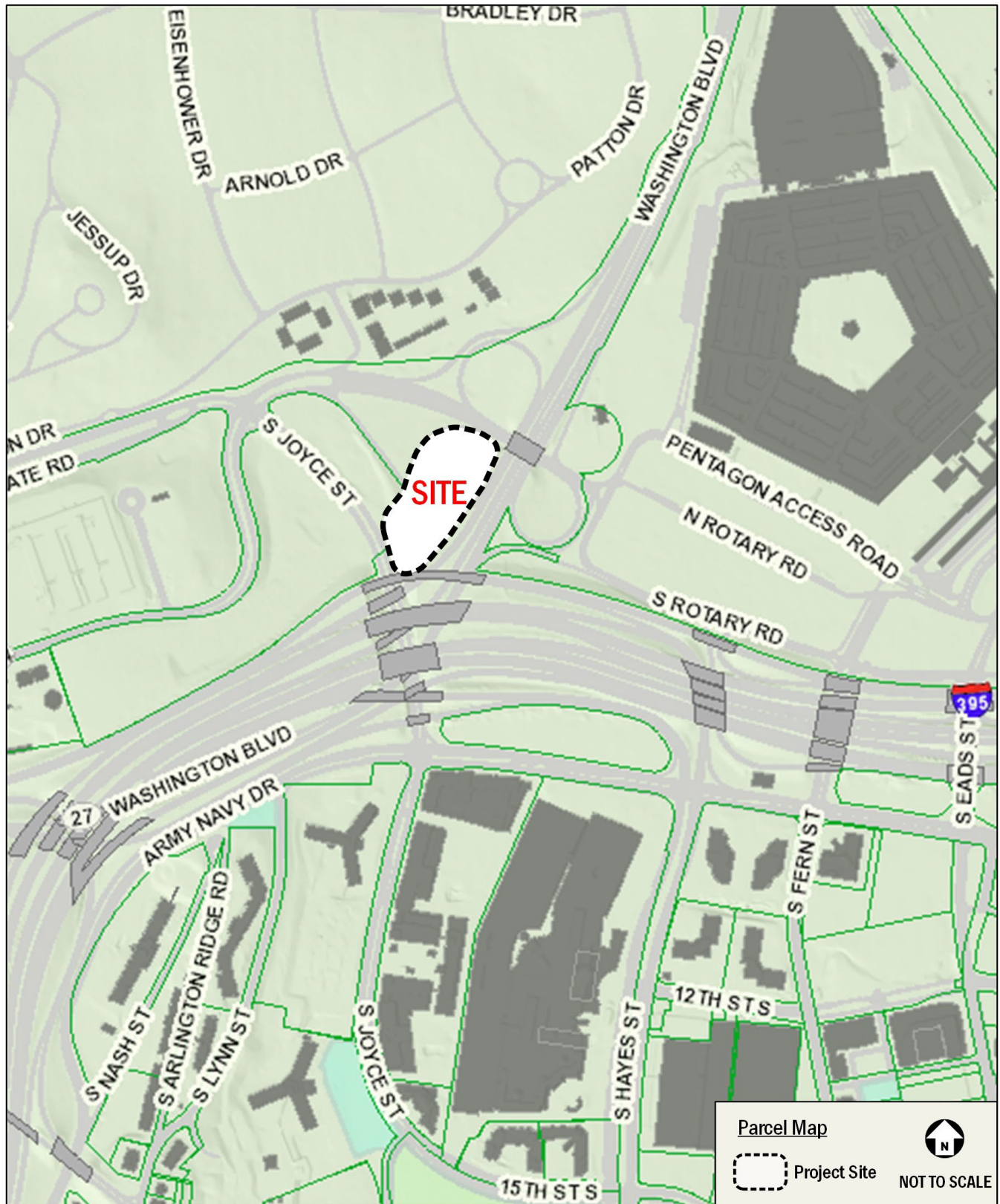


Figure 3: Parcel Map (Source: Arlington County Real Estate Map, September 2016)

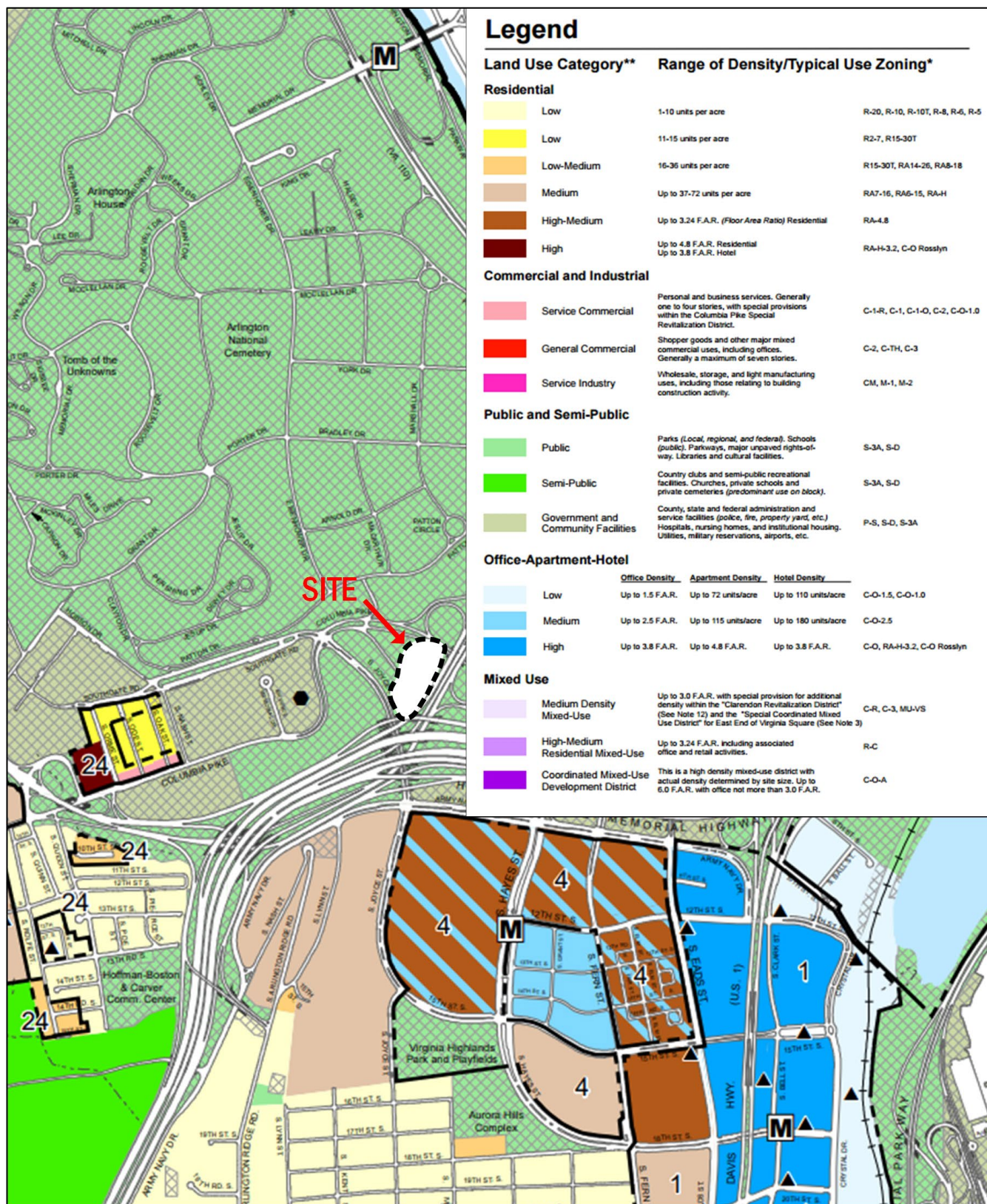


Figure 4: Planned Land Uses (Source: Arlington General Land Use Plan (GLUP), June 2017)

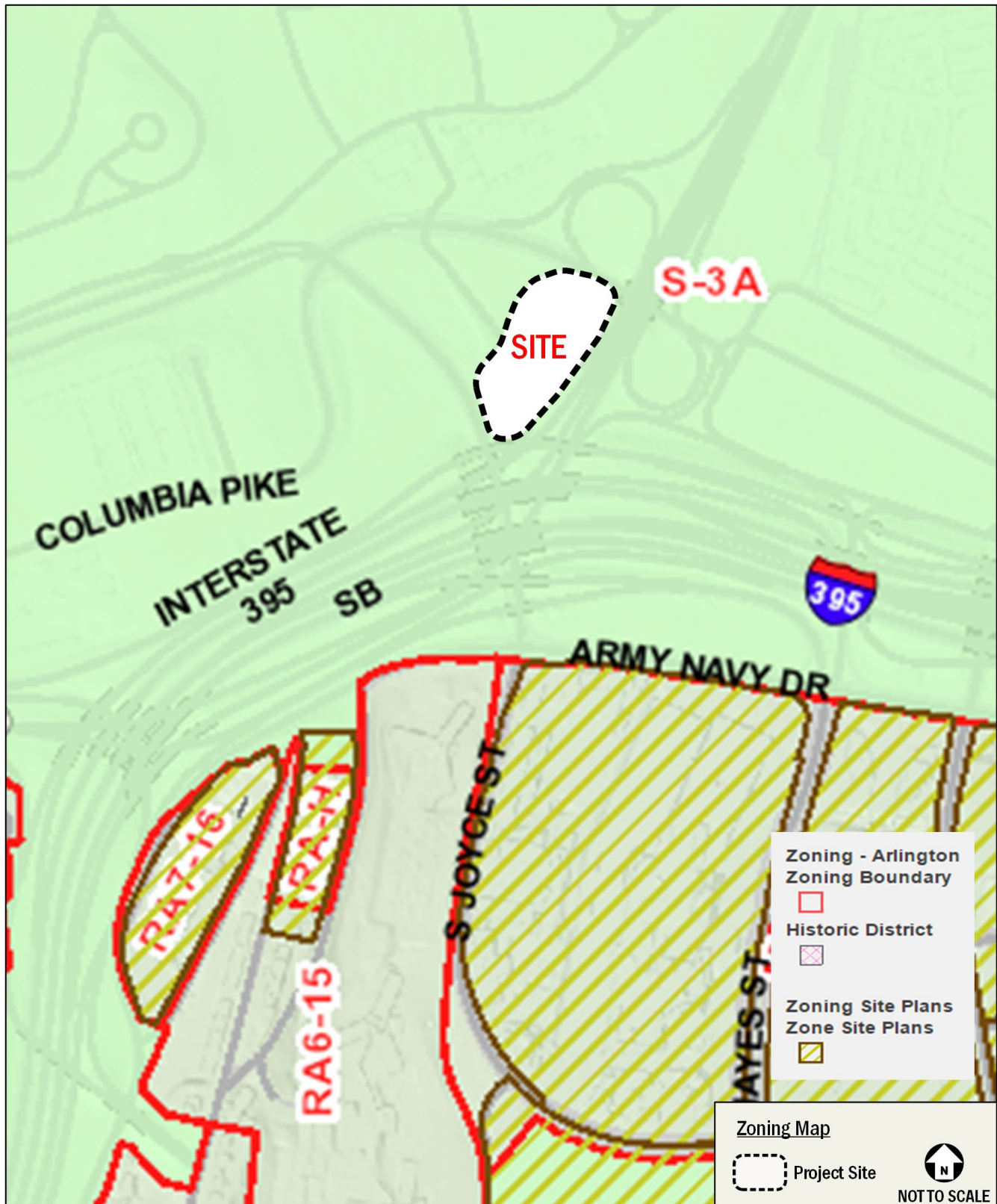


Figure 5: Zoning Map (Source: Arlington County)

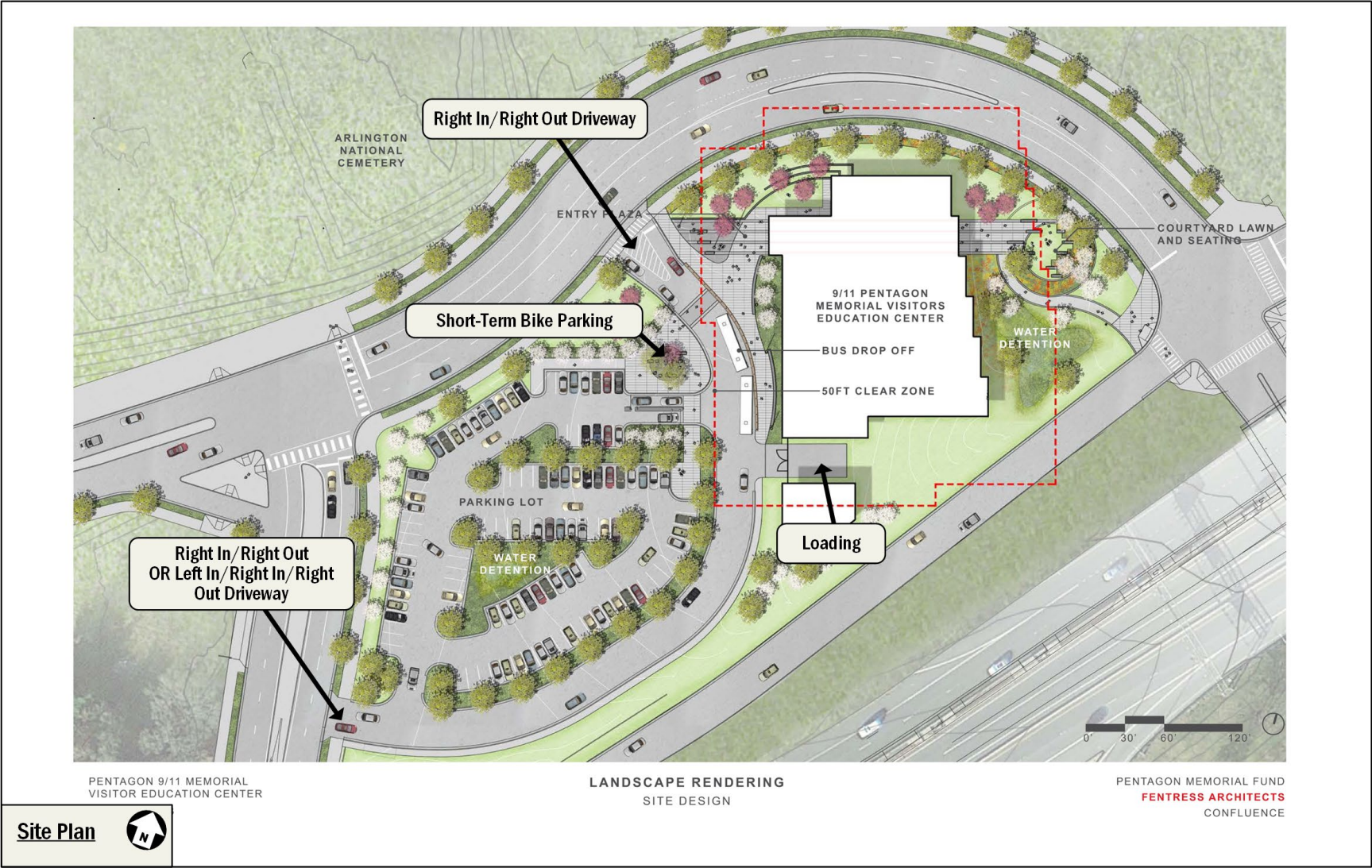


Figure 6: Site Plan

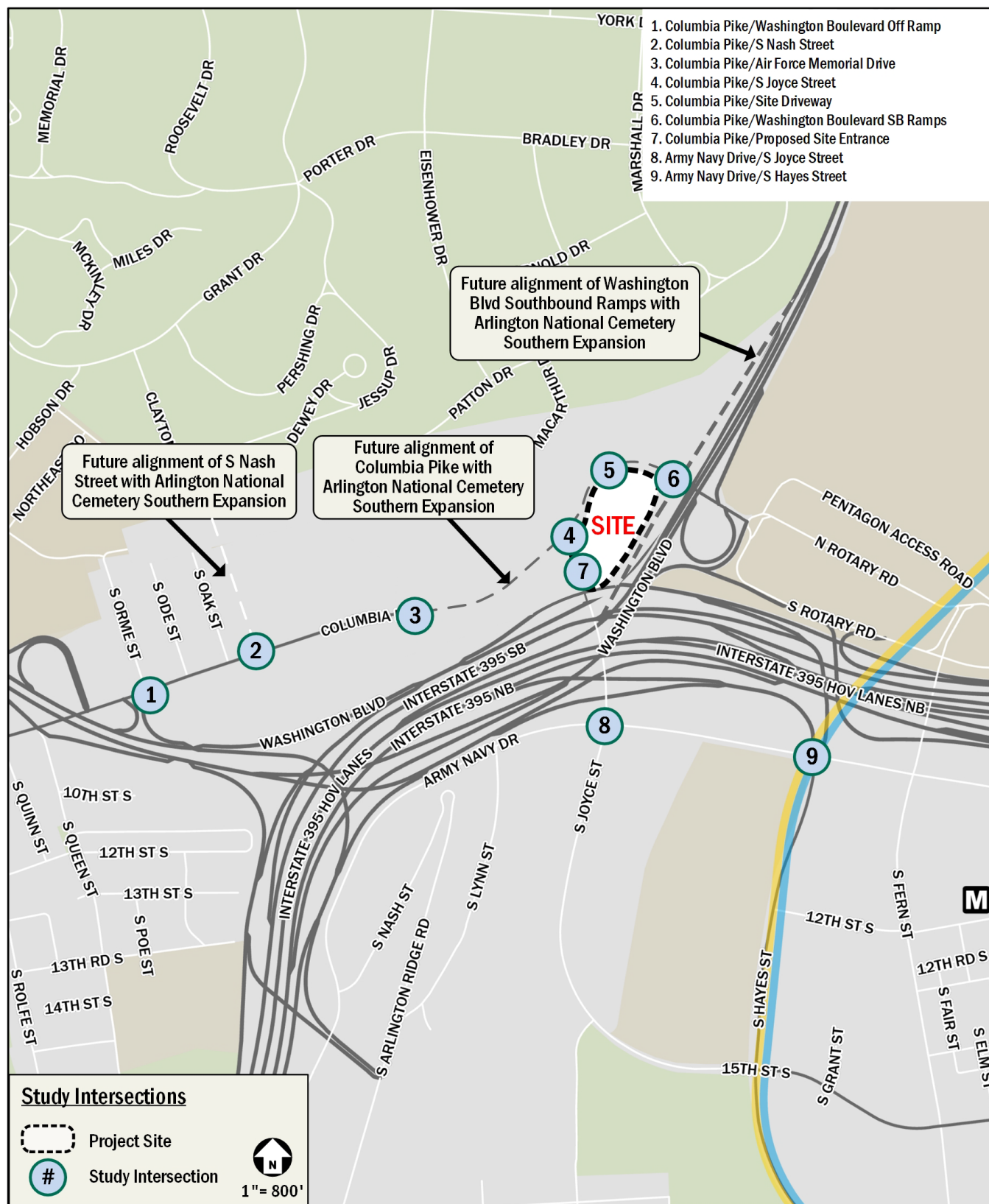


Figure 7: Study Intersections

Study Area Overview

This chapter reviews the existing conditions of the surrounding transportation network and includes an overview of the site location, including a summary of the major transportation characteristics of the area and of future regional projects. Detailed characteristics of each mode and their subsequent study areas will be defined in the following chapters.

The following conclusions are reached within this chapter:

- The site is surrounded by an extensive regional and local transportation system that will accommodate the residents, employees, and patrons of the proposed development.
- The site is well-served by public transportation with access to the Metrorail's Blue and Yellow Lines, and several local and regional bus lines.
- The site is surrounded by a well-connected pedestrian environment. In the vicinity of the site, sidewalks generally meet standards recommended by the Arlington County Master Transportation Plan with some gaps in the system.
- The site has access to several on- and off-street bicycle facilities, including bike lanes on S Joyce Street, S Hayes Street, the trail along the north side of Columbia Pike, and the Washington Boulevard Sidepath. In addition to existing facilities, background projects will also add new bicycle facilities to improve the overall bicycle network.

Major Transportation Features

Overview of Regional Access

The site has access to the Blue and Yellow Lines via the Pentagon and Pentagon City Metro Stations, which provide connections to areas in Virginia, the District, and Maryland. The Blue Line connects Springfield, VA with Largo, MD and the Yellow Line connects Huntington, VA with Greenbelt, MD, with both lines providing access to the District core. Both lines provide connections to the Red Line, which provides a direct connection to Union Station, a hub for commuter rail – such as Amtrak, MARC, and VRE – in addition to all additional Metrorail lines, allowing for access to much of the DC Metropolitan area.

The proposed development is accessible via the Washington Boulevard Sidepath which provides connectivity to existing bicycle facilities such as bike lanes on Army Navy Drive and S Joyce Street. These in turn expand its connectivity to the greater

Pentagon City area. A detailed review of existing bicycle infrastructure is provided in a later chapter of this report.

Overall, the site has access to several regional roadways, transit, and bicycle options, making it convenient to travel between the site and destinations in Virginia, the District, and Maryland.

Overview of Local Access

There are several local transportation options near the site that serve vehicular, transit, walking, and cycling trips under existing conditions, as shown on.

In addition to several principal arterials, the site is served by a local vehicular network that includes several minor arterials and collectors such as S Joyce Street, S Hayes Street, and Army Navy Drive. In addition, there is an existing network of local roadways that provide access to the site.

Several bus systems provide local transit service in the vicinity of the site, including connections to several neighborhoods within Virginia, the District, and additional Metro stations. As shown in Figure 8, there are multiple bus routes that serve the site. In the vicinity of the site the majority of routes travel along Columbia Pike, S Joyce Street, and Army Navy Drive.

There are existing bicycle facilities that connect the site to areas within Arlington, Virginia, and the District including the Washington Boulevard Sidepath, an off-street facility that extends along Washington Boulevard. There are bicycle lanes on S Joyce Street and S Hayes Street that provide connectivity to more bicycle facilities in Pentagon City and Crystal City. A detailed review of existing and proposed bicycle facilities and connectivity is provided in a later chapter of this report.

In the vicinity of the site, some sidewalks meet Americans with Disabilities Act (ADA) standards and standards recommended by the Arlington Master Transportation Plan. Anticipated pedestrian routes, such as those to public transportation stops, retail zones, nearby residential areas, and community amenities, provide well-connected pedestrian facilities. A detailed review of existing and proposed pedestrian access and infrastructure is provided in a later chapter of this report.

Overall, the site is surrounded by an extensive local transportation network that allows for efficient transportation options via transit, bicycle, walking, or vehicular modes.

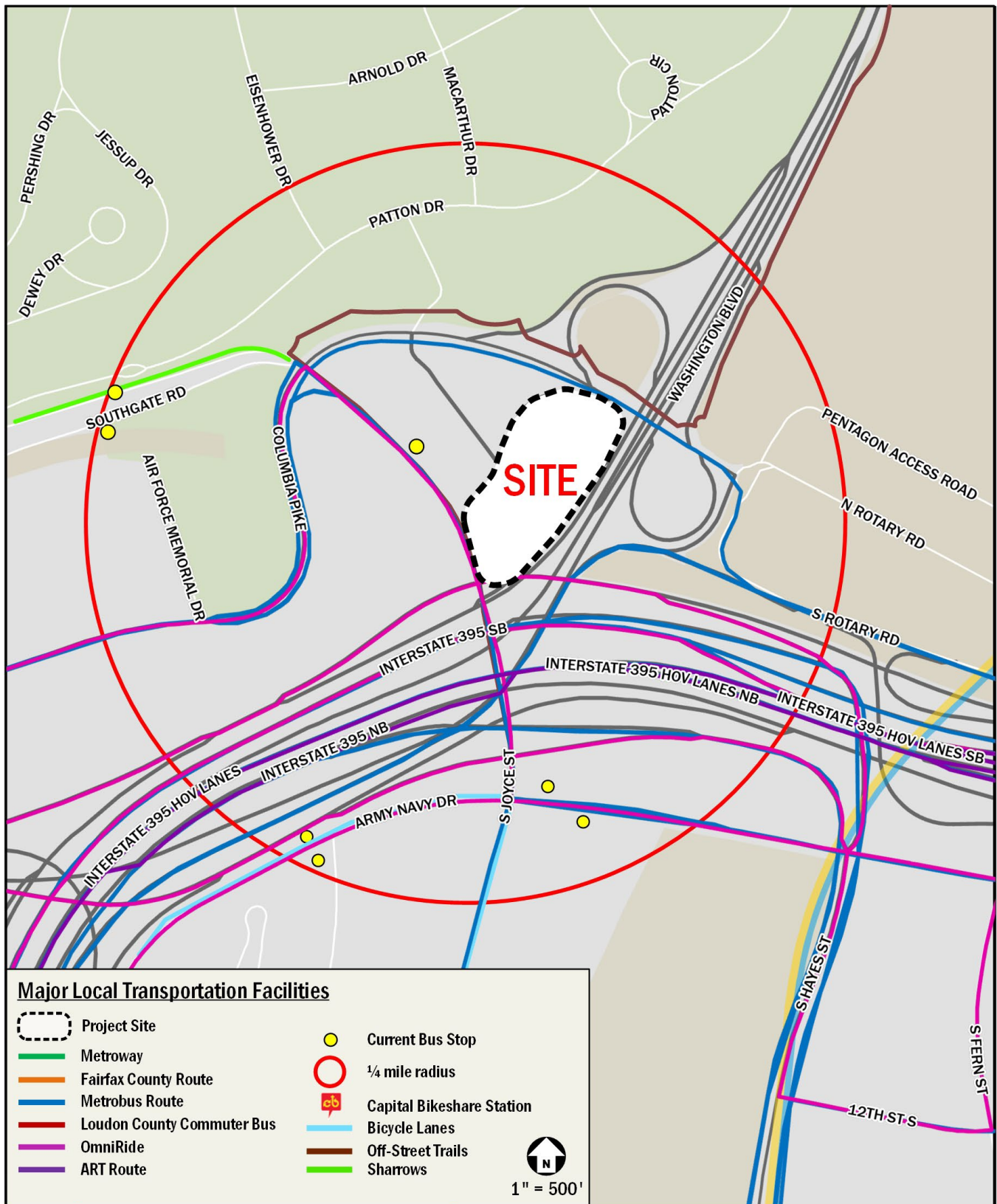


Figure 8: Major Local Transportation Facilities

Car-sharing

Car-sharing service in Arlington is provided by Zipcar. This is a private company that provides registered users access to a variety of automobiles. Zipcar has designated spaces for their vehicles. There are no Zipcars located within a quarter-mile of the site but there is one location within a half-mile of the site. These locations and the number of available vehicles are listed in Table 1.

Table 1: Carshare Locations

Location	Number of Vehicles
900 Army Navy Drive	1 vehicle
Total	1 vehicle

E-Scooters and Dockless E-Bicycles

Five (5) electric-assist scooter (e-scooter) and electric-assist bicycle (e-bike) companies provide Shared Mobility Device (SMD) service in Arlington County: Bird, Veo, Lime, Superpedestrian, and Spin. These SMDs are provided by private companies that give registered users access to a variety of e-scooter and e-bike options. These devices are used through each company-specific mobile phone application. Many SMDs do not have designated stations where pick-up/drop-off activities occur like with Capital Bikeshare; instead, many SMDs are parked in public space, most commonly in the “furniture zone” (the portion of sidewalk between where people walk and the curb, often where you’ll find other street signs, street furniture, trees, parking meters, etc.). At this time, SMD pilot/demonstration programs are underway in Arlington County, the District, Fairfax County, the City of Alexandria, and Montgomery County.

Walk Score and Bike Score

Walkscore.com is a website that provides scores and rankings for walking, biking, and transit conditions for an area. This project site is located in an area that has a walk score of 51 (or “Somewhat Walkable”), transit score of 70 (or “Excellent Transit”), and a bike score of 56 (or “Bikeable”). Figure 9 shows the neighborhood borders in relation to the site location and displays a heat map for walkability and bikeability.

The site is situated in an area with a “somewhat walkable” walk score; the score is primarily based on the availability of other land uses within walking distance of the site. The project site rates highly on its proximity to groceries and shopping/dining destinations. It receives moderate scores on its proximity to parks and receives lower scores on its proximity to schools.

The proposed development is located in an area with an “excellent transit” transit score because of its proximity to the Pentagon City Metro Station and the Pentagon Metro Station as well as its proximity to other bus lines.

The site is situated in an area with a “bikeable” bike score; the score is based on proximity to bike lanes and trails, hills, road connectivity, and destinations.

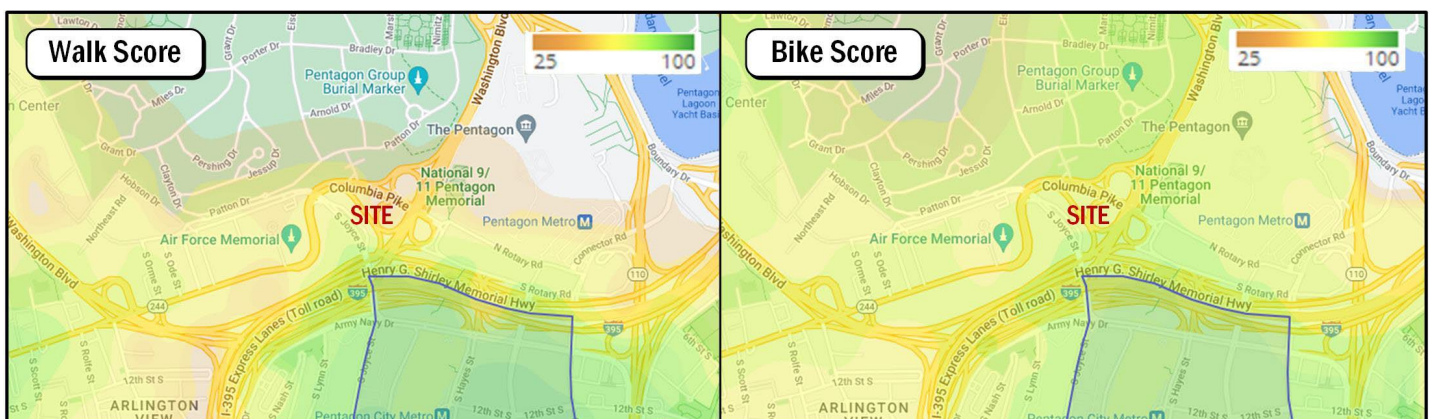


Figure 9: Summary of Walkscore and Bikescore

Future Projects

There are several County-wide initiatives, local initiatives, and planned improvements located in the vicinity of the site. These planned projects are summarized below.

County-wide Initiatives

Arlington Master Transportation Plan (2011)

The Arlington County Master Transportation Plan (MTP), adopted in 2011 and updated in 2019, outlines goals to improve various modes of transportation throughout the County. The MTP identifies goals and objectives for each mode to improve safety and access for all users, particularly for pedestrians, bicyclists, and transit users. The Arlington Master Transportation Plan's recommended policies for transportation in the County that apply to the Pentagon Memorial Visitor Education Center development are outlined as follows:

- **Streets (2016)** – The County will address the street system and enhance the transportation network by: (1) Utilizing the plan's street typology to guide street planning and ensure each street type supports the general policies of complete streets and adjacent land uses; (2) Including appropriate facilities to meet and balance the needs of all modes; (3) Constructing/converting some local streets to a pedestrian priority or a shared street; (4) Accommodating travel growth through shifts to non-auto modes; (5) Designing streets to favor lower vehicular speeds; and (6) Maintaining a grid-style network to enhance connectivity.
- **Transit (2016)** – The County will address the transit system by: (1) Developing a Premium Transit Network of high-frequency service connecting major destinations; (2) Operating a Secondary Transit Network of fixed route services that improves access to destinations across Arlington; (3) Making transit more accessible and convenient to all through enhanced facilities and transit-oriented land use policies; (4) Improving Metrorail services and stations; and (5) Expanding pedestrian access to transit facilities.
- **Pedestrian (2011)** – The County will address the pedestrian system by: (1) Completing the walkway network with appropriate facilities on both sides of arterial streets and at least one side of neighborhood streets; (2) Upgrading existing pedestrian facilities to comply with current standards; (3) Implementing measures aimed at changing motorist behavior to manage vehicular speed

and minimize vehicle/pedestrian conflicts; and (4) Developing strategies to encourage more people to walk.

- **Bicycle (2019)** – The County will address the bicycle system by: (1) Making existing streets safer and more comfortable for bicycling by all users; (2) Expanding travel safety education programs; (3) Providing a network of low-traffic-stress bicycle routes that connect all land uses; (4) Accommodating bicycle infrastructure as part of all street improvement projects; (5) Establishing bicycles as a mainstream travel mode; and (6) Encouraging bicycle facilities, including parking, showers, and lockers. The improvements planned for the bicycle facilities surrounding the site as part of the Plan are shown in Figure 11.
- **Parking and Curb Space (2009)** – The County will address the parking system by: (1) Prioritizing the use of curb space, matching the various types of uses to the most appropriate locations; (2) Promoting on-street parking within residential neighborhoods and on commercial streets to calm traffic; (3) Ensuring the minimum parking needs are met and limit excessive parking; (4) Discouraging off-street surface parking; and (5) Allowing reduced parking space requirements for new developments in close proximity to frequent transit service and requiring enhanced TDM measures.
- **Transportation Demand Management (2008)** – The County will address transportation demand management by: (1) Incorporating comprehensive TDM plans for all site plans to minimize vehicular trips and maximize the use of other modes; (2) Exploring strategies and incentives to achieve TDM measures in existing private buildings; and (3) Applying TDM programs to non-work travel, as well as commuting, through marketing strategies.

A number of elements in the proposed development are consistent with these policies:

- **Pedestrian:**
 - As part of the DAR project, pedestrian facilities along the site frontages on Columbia Pike and S Joyce Street will be upgraded to meet MTP standards. The project site itself will be designed to connect to these upgraded pedestrian facilities to facilitate access to the site.
 - Pedestrian connections to the Pentagon 9/11 Memorial will be optimized by the placement and orientation of the site.
- **Bicycle:**

- Short-term bicycle parking will be provided near the entrance of the site's main building.
- Connection, via S Joyce Street, will be provided to the planned upgraded bicycle facilities along Army Navy Drive.
- Transportation Demand Management:
 - TDM measures will be implemented for the development to discourage auto travel and encourage the travel by other modes.

The MTP also identifies the following recommendations in the vicinity of the Pentagon Memorial Visitor Education Center development:

- Transit:
 - Expansion of the Crystal City/Potomac Yard transitway into Pentagon City.
 - Improved service along Columbia Pike and optimized connections with the extended Crystal City/Potomac Yard transitway.
- Bicycle:
 - Upgrade the Columbia Pike corridor to better connect the Pentagon, Crystal City, and the 14th Street Bridge to the east and Bailey's Crossroads to the west, with multiple destinations and connections in between.
 - Bi-directional, protected bicycle lanes along Army Navy Drive from S Joyce Street to 12th Street S.
 - Upgrade the existing bicycle lanes on S Joyce Street and 15th Street S between Army Navy Drive and S Hayes Street to include more separation from motor vehicle traffic.

In direct relation to the Pentagon Memorial Visitor Education Center development, these recommendations would create additional multi-modal capacity and connectivity to/from the site.

Local Initiatives

Pentagon City Sector Plan (2022)

Arlington County initiated the Pentagon City Planning Study in 2019 to help guide future development in Pentagon City and define the capacity for the future growth in the Pentagon City Phased Development Site Plan (PDSP). As part of this project, a transportation analysis was conducted that evaluates a series of preliminary land use scenarios and serves as the foundation for the planning study. The draft report for the study, released in January 2022, identifies potential improvements to the multi-modal transportation system to better accommodate additional trips generated by future redevelopment. While the Pentagon

Memorial Visitor Education Center development is just outside of the Pentagon City Plan's extents, there are a number of recommended improvements that will improve multimodal connectivity in the vicinity of the site:

- Minimum 8 ft clear zone for passage along sidewalks on S Joyce Street, S Eads Street, and 15th Street S.
- Optimized connections to improved pedestrian and bicycle facilities along the realigned Columbia Pike.
- Creation of new access ways within the Fashion Centre and Westpost block bounded by Army Navy Drive, S Joyce Street, and S Hayes Street. This will provide multimodal routes through the block and promote an inter-connected city block network.
- Filling in of gaps in the County's network of pedestrian infrastructure, including through and across sites.
- Decrease block lengths to less than 500 feet, or less than 400 feet, where feasible.
- Consider a separated bikeway along S Joyce Street, with optimized connections to Columbia Pike and the bikeway improvements along Army Navy Drive which are currently under construction.
- Construct a separated bikeway along S Hayes Street.
- Extension of the Crystal City-Potomac Yard Transitway to provide dedicated bus facilities along the majority of the route between the Braddock Road Metrorail station in Alexandria and the Pentagon City Metrorail station (via the Potomac Yard and Crystal City Metrorail stations).
- Conversion of the Pentagon Reservation parking lot north of Army Navy Drive and east of S Joyce Street into a bus transfer facility, which could be utilized by a number of regional transit agencies.
- Improvements to bus service along Columbia Pike, providing more direct and efficient service to Pentagon City and Crystal City.

In direct relation to the Pentagon Memorial Visitor Education Center development, these recommendations would create additional multi-modal capacity and connectivity to/from the site.

22202 Study (2016)

In response to community concerns regarding the development impacts in Pentagon City and Crystal City, Arlington County completed a study including transportation material, data, and plans for the 22202 Zip Code. The study presents data on past,

present, and projected vehicular traffic and multimodal trends for the entire zip code. Among the data presented in the report is the Journey to Work Mode Split information by census tract, which shows a 35% auto mode split in the Crystal City area and a 28% auto mode split in the Pentagon City area, which supports the mode splits assumed in this report.

Planned Improvements

Arlington National Cemetery Southern Expansion (ANCSE)

The Arlington National Cemetery Southern Expansion is the expansion of Arlington National Cemetery to the south of its existing limits. This expansion will include the integration of the Air Force Memorial into the secure boundary of ANC. The expansion will occupy portions of land currently used by the existing cemetery Service Complex, and portions of Columbia Pike, S Joyce Street, and Southgate, all of which will be realigned or removed as part of the DAR project.

Arlington National Cemetery Defense Access Roads (DAR) Project

The Arlington National Cemetery Southern Expansion is being accommodated through the realignment and removal of existing roads along the southern edge of the Cemetery. The implementation of these changes to the roadway network is being led by the Federal Highway Administration (FHWA) as part of the Arlington National Cemetery Defense Access Roads (DAR) Project, referred to in this report as the “DAR project.” The project will realign Columbia Pike from east of South Oak Street to Washington Boulevard and modify the S Joyce Street intersection and the Columbia Pike/Washington Boulevard (Route 27) interchange. The project will also remove a segment of Southgate Road and construct a new S Nash Street west of the Air Force Memorial. The reconfiguration of these roadways will accommodate the Arlington National Cemetery Southern Expansion (ANCSE) project, and will create the site for the Visitor Education Center.

The DAR project includes the design and construction of all facilities within the public right-of-way, including along the portions of S Joyce Street, Columbia Pike, and the new Washington Boulevard on-ramp fronting the site. Notably, the project will provide 8-foot wide sidewalks on both sides of Columbia Pike and S Joyce Street, and will provide a 10-foot

wide off-street cycle track along the north side of Columbia Pike between S Nash Street and Washington Boulevard.

Columbia Pike Multimodal Street Improvements

To make Columbia Pike a safer, more accessible route for all users, Arlington will transform this main thoroughfare into a complete street that balances all modes of travel and supports high-quality, high-frequency transit service.

The project is being built into segments. Construction of Segment F and Segment A began in 2022. Segment F extends from S Wakefield Street to S Oakland Street. Segment A extends from S Orme Street to S Joyce Street. The County is currently implementing the portion of Segment A between S Orme Street and S Oak Street; the portion of Columbia Pike east of S Oak Street is being implemented as part of the DAR project.

Transit stations will make travel along the corridor safer. Improvements to accessibility and overall attractiveness will help improve the corridor. Improvements to the transit amenities will include real-time arrival information, shelters, and benches.

Army Navy Drive Complete Street (2017)

The Army Navy Drive Complete Street project will reconfigure Army Navy Drive between S Joyce Street and 12th Street S to create a multimodal complete street, featuring enhanced transit, bicycle, and pedestrian facilities. This project will include a physically separated two-way bicycle lane along the south side of Army Navy Drive, shorter and safer pedestrian crossings, and will accommodate future dedicated transit lanes. Vehicular travel lanes will be reduced where appropriate and will be narrowed for a slower urban context. The project will also extend the Crystal City Potomac Yard Transitway into Pentagon City by adding one dedicated transit lane in each direction along Army Navy Drive between S Joyce Street and S Hayes Street. Vehicular travel lanes will be reduced where appropriate and narrowed to promote a slower, urban environment. The existing raised medians will be re-built as planted medians. The project is expected to be completed by 2024.

In direction relation to the Pentagon Memorial Visitor Education Center development, improvements will include a new separated two-way bicycle lane on Army Navy Drive, reduced vehicular travel lanes, and enhanced pedestrian facilities near the development, improving the multimodal connectivity to/from the site.

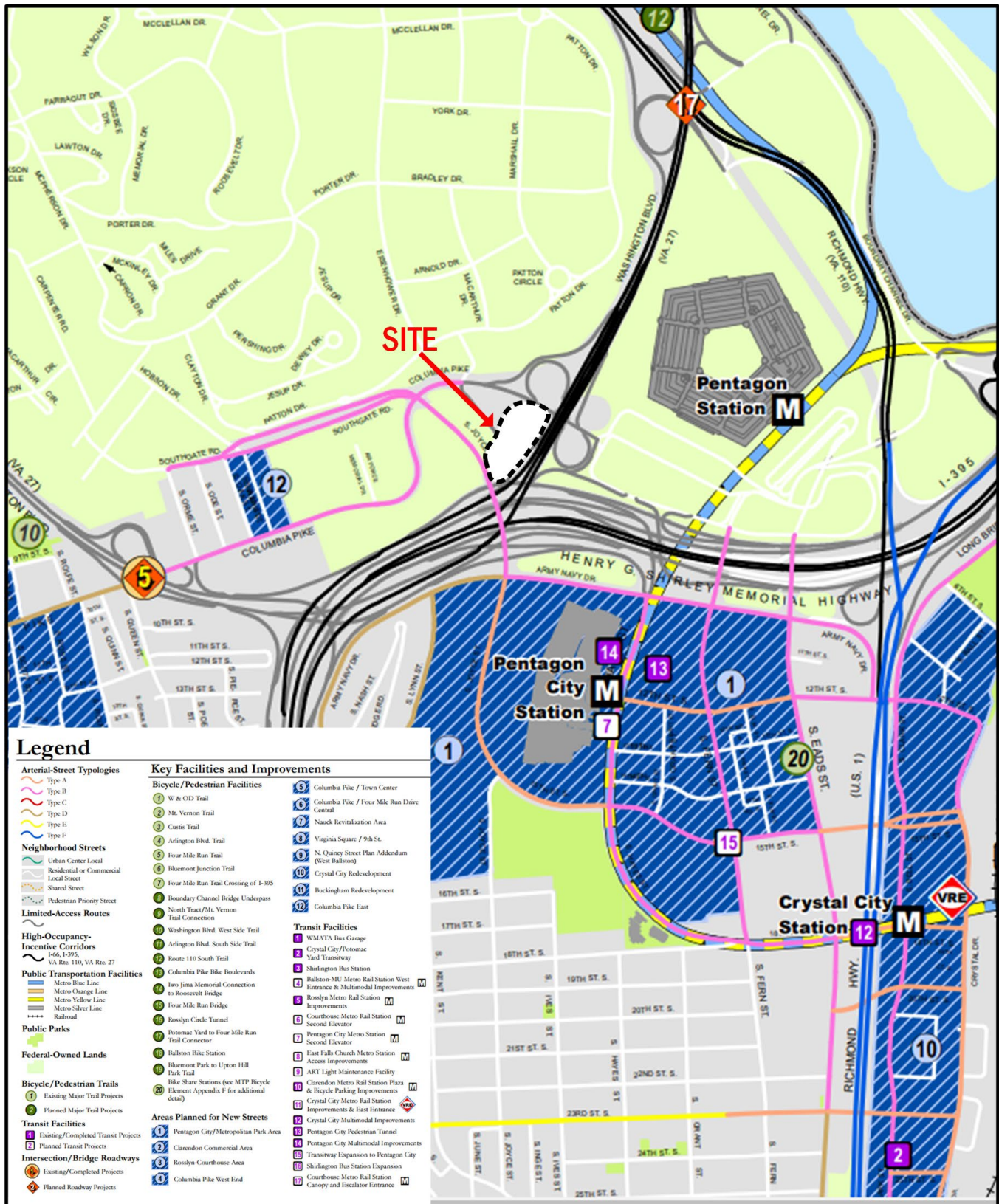


Figure 10: Street Typology (Source: Arlington Master Transportation Plan, 2011)

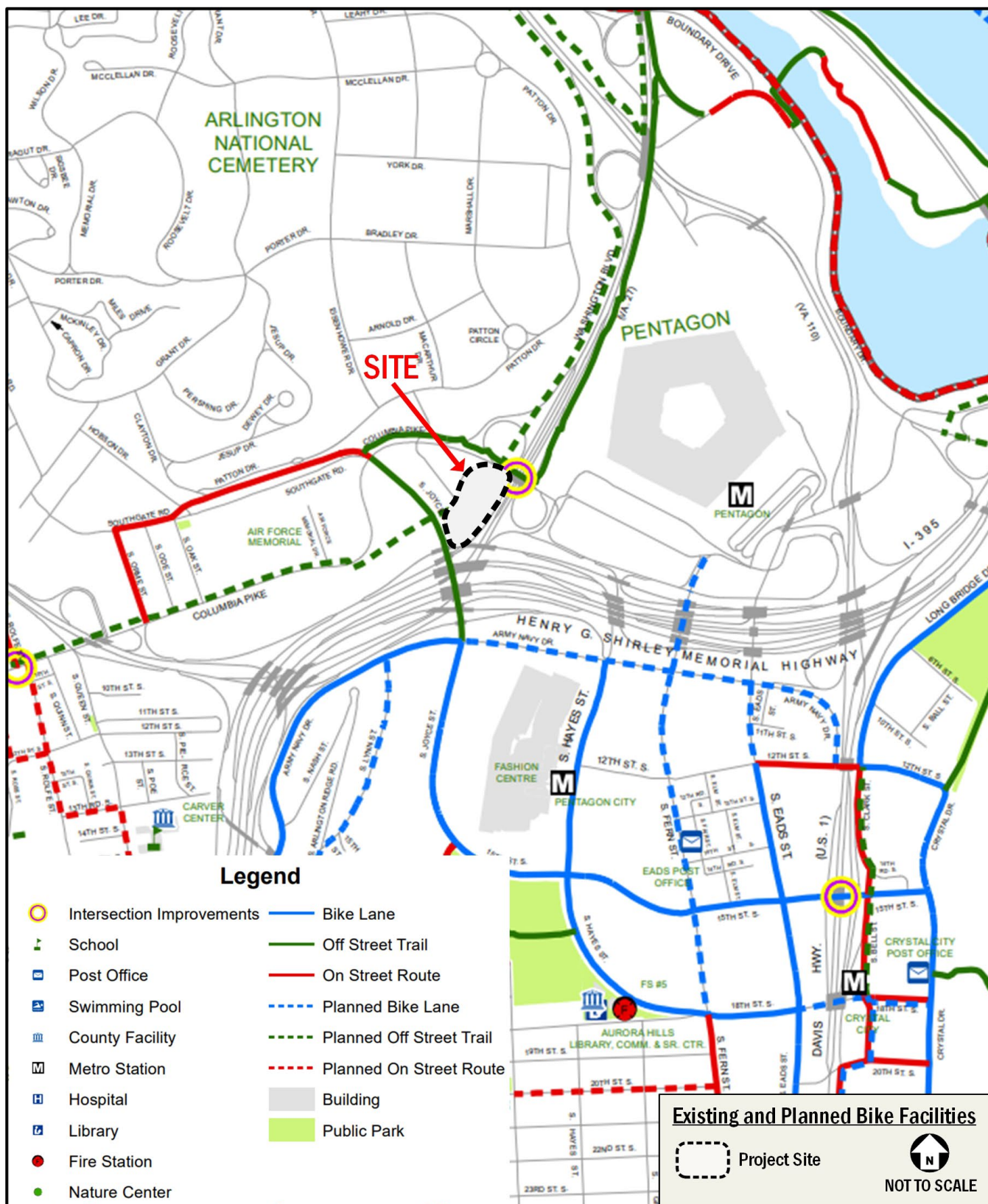


Figure 11: Existing and Planned Bike Facilities (Source: Arlington Master Transportation Plan, 2019)

Project Design

This chapter reviews the transportation components of the Pentagon Memorial Visitor Education Center development, including the proposed site plan and access points. It includes descriptions of the site's vehicular access, loading, parking, bicycle, and pedestrian facilities.

The proposed development site is located along the eastern portion of Columbia Pike in Arlington, Virginia. The DAR project will realign the eastern end of Columbia Pike, modify its intersection with S Joyce Street and its interchange with Washington Boulevard (VA Route 27) near the Pentagon, and replace Southgate Road with a new S Nash Street alignment. The reconfiguration of these roadways will create the site for the Visitor Education Center project, bound by S Joyce Street to the west, Washington Boulevard to the east and south, and Columbia Pike to the north. The site location is shown in Figure 2. The proposed site plan for the redevelopment is shown in Figure 6.

The proposed development will construct a Visitor Education Center to educate and remember the events of September 11, 2001 at the Pentagon and provide logistical support for the existing 9/11 Pentagon Memorial. The 9/11 Pentagon Memorial is located northeast of the proposed site near the Pentagon. The proposed building will house an exhibit gallery that educates visitors on the events surrounding 9/11. A multi-purpose conference center and education space is also proposed within the same building, which will be used for both daytime conferences/meetings and evening special events. The building will be approximately 50,000 gross square feet in size over two floors. The exhibit space is approximately 15,000 square feet with ancillary support spaces and the Conference Center is approximately 5,200 square feet with pre-function and ancillary support spaces. A loading dock will be provided on the south side of the building. Approximately 100 parking spaces will be provided in an on-site surface parking lot.

Adjacent and Internal Roadways

The DAR project will be completing improvements within the public right-of-way in the study area and along the frontages of the site. These include improvements to multimodal infrastructure along Columbia Pike and S Joyce Street and the curb cuts for the site driveways on Columbia Pike and S Joyce Street. As such, the proposed development will not be constructing these improvements; however, because they are

located on the site frontages and provide access to the site, they are described in this section.

Columbia Pike

The DAR project will realign Columbia Pike east of S Oak Street and provide multimodal streetscape elements along the frontage of the site. On the south side of the street (along the site frontage) the DAR project will provide a 8-foot sidewalk and a 5-foot landscape buffer. On the north side of the street, the DAR project will provide a 8-foot sidewalk, and a 10-foot off-street cycle track, separated by a 4-foot buffer. A 5-foot landscape buffer will be provided between the cycle track and the street.

S Joyce Street

As part of the DAR project, S Joyce Street will be reconstructed north of I-395, with the S Joyce Street/Columbia Pike intersection being relocated south, and new multimodal streetscapes being provided. On the east side of the street, the DAR project will provide a 10-foot sidewalk and a 5-foot landscape buffer. On the west side of the street, the DAR project will provide a 9-foot sidewalk and a 4-foot landscape buffer.

Washington Boulevard

The DAR project will remove the existing westbound Washington Boulevard cloverleaf interchange ramps and replace them with a directional westbound off-ramp from Washington Boulevard and a direction westbound on-ramp from Columbia Pike, which would meet at a signalized intersection on Columbia Pike. The new directional westbound on-ramp from Columbia Pike to Washington Boulevard would create the southern frontage of the site.

Site Internal Roadway

The development will include an internal roadway connecting the driveways on Columbia Pike and S Joyce Street. Access to the on-site surface parking lot will be provided from this internal roadway. The internal roadway is envisioned to be a 30-foot wide road with a 5-foot wide sidewalk on the east side. Along different segments of this internal roadway, curbside space is proposed to be used for bus pick-up/drop-off, bus layover, and vehicle pick-up/drop-off.



Figure 12: Arlington National Cemetery Southern Expansion and Site Location

Site Access and Circulation

Pedestrian Access

The primary pedestrian access points to the Pentagon Memorial Visitor Education Center are shown in Figure 13. Most visitors and staff will enter the building via the entrance located at the northwest corner of the building. A second pedestrian entrance will be located at the northeast corner of the building. A circulation plan showing expected pedestrian routes is shown in Figure 14.

Bicycle Access

Short-term bicycle parking spaces will be provided in the landing area located across the internal driveway from the building, as shown on Figure 14. Bicycle access to the site is primarily expected to occur via Columbia Pike and the off-street cycle track being constructed on the north side of Columbia Pike as part of the DAR project. A circulation plan showing expected bicycle routes is shown in Figure 14.

Vehicular Access

Vehicular access to the site will be provided via two driveways: one on Columbia Pike and one on S Joyce Street. In the current version of the site plan, both of these driveways are designed to be right-in/right-out only. The project team is currently studying the feasibility of an alternative configuration of the S Joyce Street driveway, in which a median break would be provided on S Joyce Street to permit southbound left turns into the site.

The development will include an internal road connecting the driveways on Columbia Pike and S Joyce Street. Access to the on-site surface parking lot will be provided from this internal driveway.

Wayfinding

In the event that the site plan ultimately includes right-in/right-out only access at both site driveways (with no left-turn access into the site from S Joyce Street), a strong wayfinding program will need to be implemented to direct visitors arriving by automobile to the site. In particular, if visitors are coming from the north on Washington Boulevard (VA Route 27), they should bypass the Washington Boulevard/Columbia Pike interchange near the site. Instead, they should take the exit onto eastbound Columbia Pike at the Washington Boulevard/Columbia Pike interchange located west of the site (using the off-ramp leading to Columbia Pike/S

Orme Street). This will allow visitors to access the site by making a right turn from Columbia Pike.

Loading

The development will provide two (2) 40-foot loading spaces for the shared use of the visitor education center and multi-purpose conference center uses. The number of on-site loading facilities will accommodate the practical needs of the development. Figure 6 shows the locations of the loading space adjacent to the building.

Parking

The proposed development will provide approximately 100 parking spaces in an on-site surface parking lot. The parking lot will be accessed at two locations along the internal roadway; the northern access point will be a dual entry/exit into the parking lot, and the southern access point will be exit-only. The parking lot will be access-controlled and limited to visitors of the visitor education center, multi-purpose conference center, or the Pentagon 9/11 Memorial. Figure 13 shows the location of the parking access points.

Curbside Management

A review of the existing curbside management was conducted and is shown in Figure 15. Generally, there is no on-street parking in the vicinity of the proposed development. After the completion of the DAR project and the proposed development, the "No Parking" zones along Columbia Pike and S Joyce Street will be maintained. The proposed curbside management is shown in Figure 16.

Bus Pick-Up/Drop-Off

The east side of the internal roadway segment fronting the proposed building will serve as the pick-up/drop-off zone for buses visiting the site. The bus pick-up/drop-off zone will be approximately 100 feet long which will provide space for two (2) full-sized motorcoaches up to 45' in length. The curb along this bus pick-up/drop-off zone will be flush with the street.

Additionally, a bus layover zone is proposed on the east side of the internal roadway, located between the loading access and the S Joyce Street driveway. The layover zone will be approximately 330 feet long which will provide space for up to six (6) full-sized motorcoaches up to 45' in length. The bus pick-up/drop-off zone and bus layover zone are shown in Figure 16.

Bicycle and Pedestrian Facilities

Bicycle Facilities

Bicycle Parking

Short-term bicycle parking spaces will be provided in the landing area located across the internal driveway from the building, as shown on Figure 14. The number of bicycle parking spaces is yet to be determined.

Pedestrian Facilities

The existing pedestrian facilities around the site provide an adequate walking environment. Pedestrian facilities surrounding the site will be improved as part of the DAR project and will include widened sidewalks on both sides of S Joyce Street and both sides of Columbia Pike. These facilities will provide a more inviting pedestrian environment and comply with the improvements laid out in the Arlington Master Transportation Plan.

New pedestrian facilities are expected to meet or exceed Arlington County requirements with an emphasis on pedestrian safety and comfort. This includes sidewalks that meet or exceed the width requirements, crosswalks at all necessary locations, and curb ramps with detectable warnings.

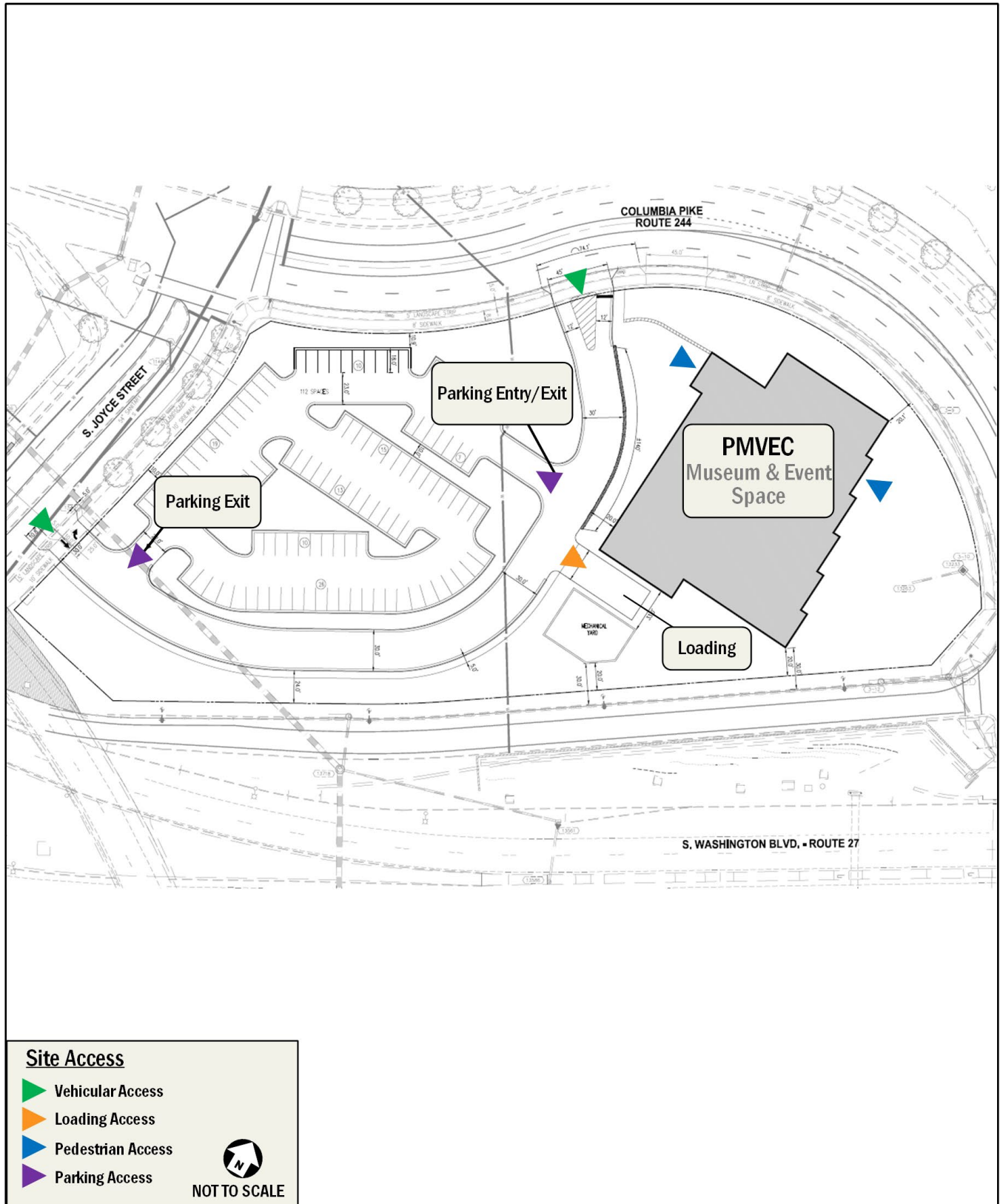


Figure 13: Site Access

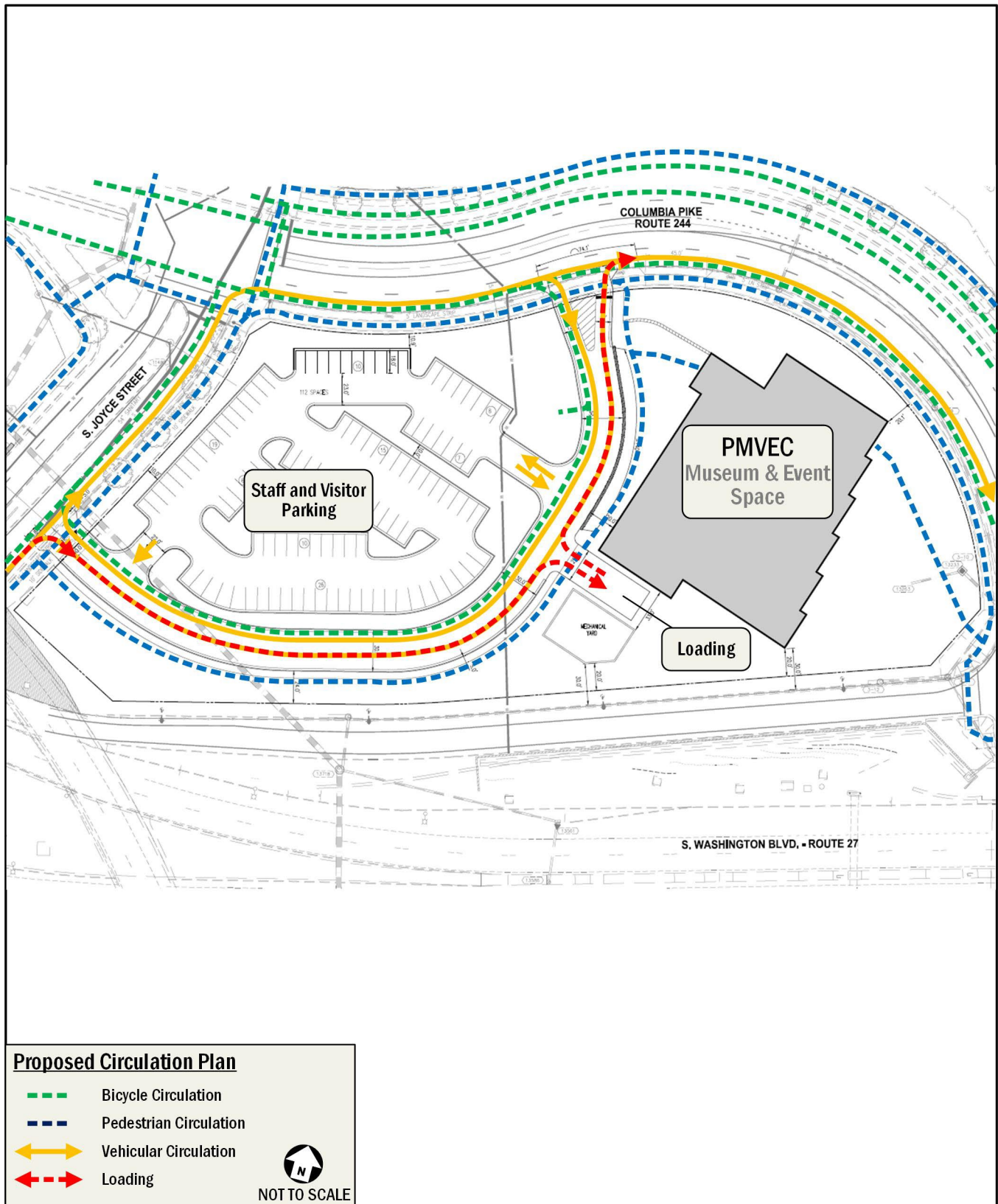


Figure 14: Proposed Circulation Plan

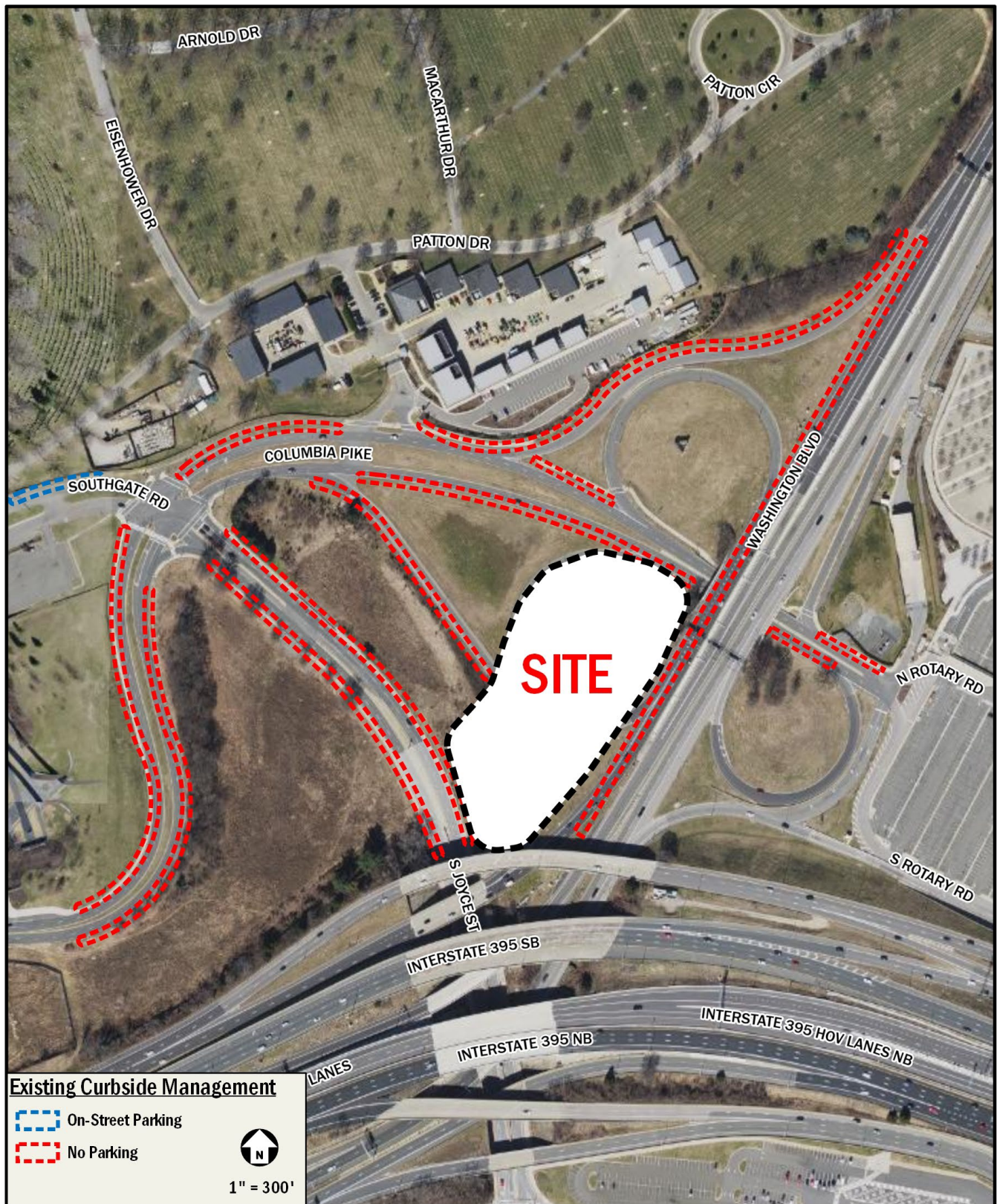


Figure 15: Existing Curbside Management

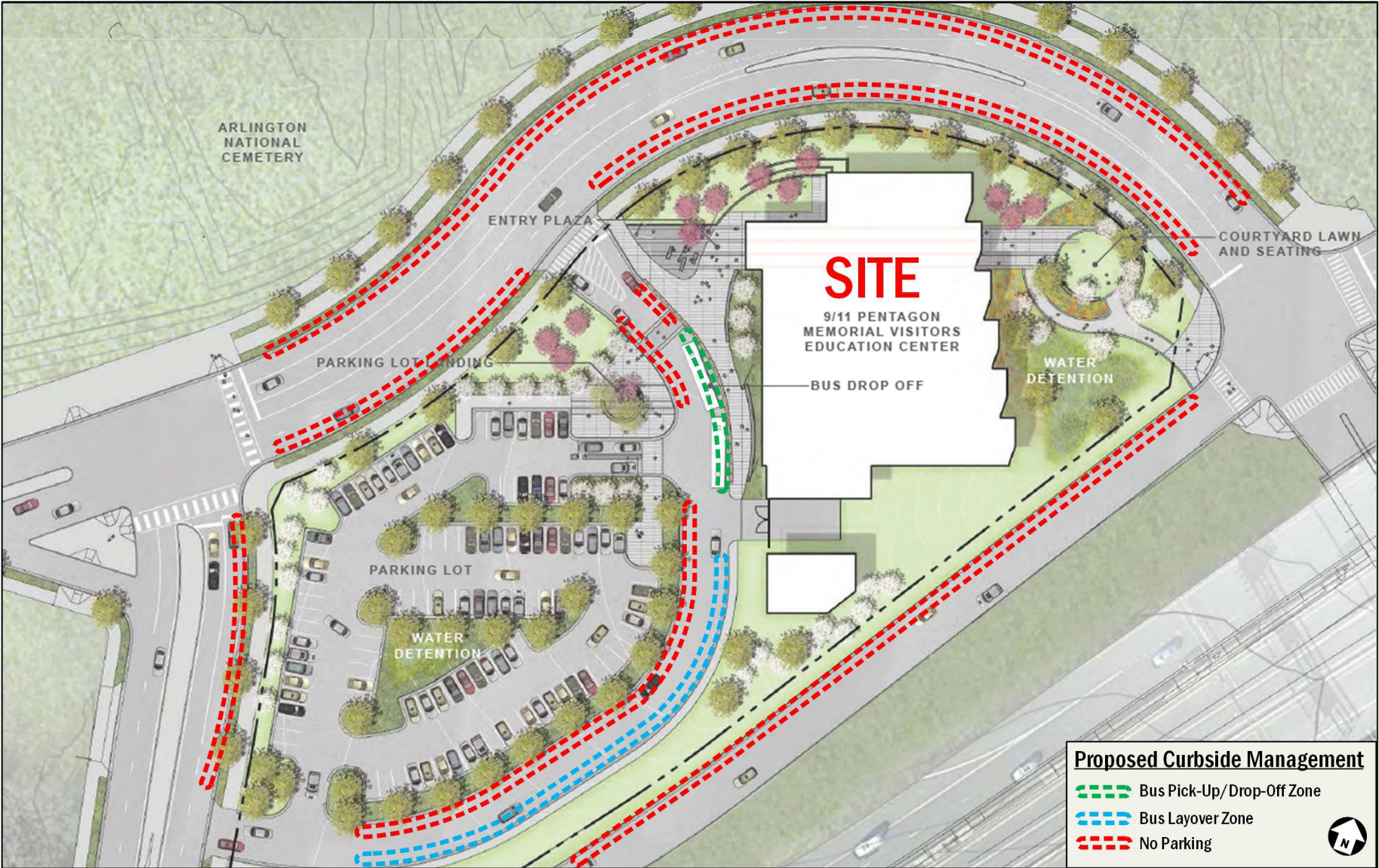


Figure 16: Proposed Curbside Management

Transit

This chapter discusses the existing and proposed transit facilities in the vicinity of the site, accessibility to transit, and evaluates the overall transit impacts of the project.

The following conclusions are reached within this chapter:

- The development has good access to transit.
- The development is located 0.5 miles from the Pentagon City Metro Station and 0.7 miles from the Pentagon Metro Station.
- There are six (6) bus stops within a quarter-mile of the site. These stops are directly served by WMATA (Metrobus), Metroway, and Arlington Transit (ART), OmniRide, Fairfax Connector, and Loudoun County Commuter routes.
- Future planned transit improvements in the vicinity of the site include an extension of the transitway as part of the Transitway Extension to Pentagon City. These will further improve transit access by providing additional facilities and connectivity via Metroway. Additionally, the proposed improvements along the Columbia Pike transit corridor will improve multi-modal connectivity to the site with enhanced transit amenities and changes to service.

The site is well-served by numerous transit options under existing conditions. Combined, these transit services provide local, citywide, and regional transit connections and link the site with major cultural, residential, employment, and commercial destinations throughout the region. Figure 17 identifies the major transit routes, stations, and stops in the study area.

Metrorail Service

The site is located approximately 0.5 miles from the Pentagon City Metro Station and 0.7 miles from the Pentagon Metro Station. The Pentagon City Metro station is located south of the development site between 12th Street S and 15th Street. It can be reached by walking south from the site on S Joyce Street and east on Army Navy Drive and south on S Hayes Street. There are sidewalks, curb ramps, and crosswalks along both routes, providing an adequate walking environment to and from the Metro stations. I-395 and Washington Boulevard to the south and east of the site are barriers to pedestrian connectivity, making the “last mile” connection to the site from transit less pedestrian-friendly than it would be otherwise.

The Pentagon City Metro Station and Pentagon Metro Station serve the Blue and Yellow Lines. The average daily ridership at the Pentagon City and Pentagon stations in 2022 was approximately 4,310 and 4,639 boardings on weekdays, respectively, according to the WMATA Ridership Data Portal. Average daily weekend ridership at the Pentagon City and Pentagon stations in 2022 was 3,331 and 728 boardings, respectively. The Blue Line travels north from Springfield, VA to Rosslyn then continues east to Largo, MD. Trains run approximately every 8 minutes during the morning and afternoon peak periods. They run about every 12 minutes during weekday non-peak periods, every 20 minutes on weekday evenings after 9:30pm, and every 12-20 minutes on weekends. The Yellow Line travels north from Huntington, VA to the Pentagon, east to the District core, and continues north to Mount Vernon Square. Yellow line trains run approximately every 8 minutes during the morning and afternoon peak periods. Blue line trains run about every 12 minutes during weekday peak periods, every 15 minutes during weekday non-peak periods, and every 15 minutes on weekends.

At the Pentagon City Metro Station, which is a transfer point for regional and local transit buses and bus services, a second elevator is planned on the west side of S Hayes Street. Currently, there is a single elevator serving the station, which is located on the east side of S Hayes Street. The new elevator will improve access for patrons and will provide redundancy when one elevator is out of service.

Bus Service

A review of the existing Metrobus stops within a quarter-mile radius of the site, detailing individual bus stop amenities and conditions, is shown in Table 2. There are four (4) bus stops within one-quarter mile of the site. The four (4) bus stops are located on Army Navy Drive. These stops are served by four (4) WMATA (Metrobus) routes and (3) ART routes.

Due to the construction phase of the DAR project, some bus stop locations and bus stop amenities have been displaced. The site is served by several bus lines and routes along multiple primary corridors. These bus lines connect the site to many areas of Virginia and the District, including several Metrorail stations serving all of the six (6) Metrorail lines. Table 3 shows a summary of the bus route information for the routes that serve the site, including service hours, headway, and distance to the nearest bus stop.

Figure 18 shows the 10-minute, 20-minute, and 30-minute transit travel shed to and from the proposed development. As shown in the transit travel shed, parts of the District and Northern Virginia area is accessible via transit within 30 minutes from the proposed development. Several destinations in the District, Arlington, and Alexandria are accessible within a 20-minute transit trip from the proposed development, including Ronald Reagan Washington International Airport, Downtown DC, and Metro stations served by all metro lines in the area.

Planned Transit Facilities

Improvements to transit facilities will be made as part of the Army Navy Drive Complete Street project, the 12th Street S Complete Street project, and the Pentagon City Transitway Extension project.

- As part of the Army Navy Drive Complete Street project, improvements will include a dedicated transit-only lane in each direction extending along Army Navy Drive between S Joyce Street and S Hayes Street.
- As part of the 12th Street S Complete Street project, improvements will include dedicated center-running transit-only lanes extending along 12th Street S from Army Navy Drive to S Hayes Street.
- As part of the Crystal Drive segment of the Transitway Extension to Pentagon City project, improvements will initially include curbside rush hour bus-only lanes from 15th Street S to 12th Street S and Long Bridge Drive and five (5) new transitway stations, with two (2) additional stations included in later phases.

Planned transit improvements are shown in Figure 19.

Arlington Master Transportation Plan (2019)

The Arlington County Master Transportation Plan (MTP), adopted in 2011 and updated in 2019, outlines goals to improve various modes of transportation throughout the County. The MTP Transit Element identifies policies, implementation actions, and performance measures to:

- increase transit service options;
- improve access to transit services for all;
- improving transit facilities;
- creating multi-modal centers for convenient transfers;
- expanding transit information distribution and marketing outreach; and

- employing environmentally-sensitive technologies.

The MTP envisions public transit as a central feature of the County's transportation system as the resident and employment populations grow in the future. A key aspect of the plan is the implementation of a Premium Transit Network (PrTN) and Primary Transit Network (PTN). Historically, the County has organized development around the Metrorail corridors; the MTP extends this policy to the Premium and Primary Transit Networks.

The PrTN includes the Columbia Pike and Pentagon City/Crystal City corridors and features high frequency, branded, and easy to understand bus routes with passenger amenities such as real-time transit information and high-quality transit stations.

The MTP identifies the following recommendations in the vicinity of the project:

- Consolidate bus stops and construct new, high-quality, unique transit stations along Columbia Pike.
- Implement transit signal priority along the [PrTN] corridor to speed travel times for buses.
- Expand pedestrian access to transit facilities through measures such as improved sidewalks, new station entrances, upgraded street crossings, and new elevators and escalators.

As it relates to the proposed development project, the Columbia Pike corridor is a part of the PrTN. The proposed improvements along the Columbia Pike transit corridor will improve multi-modal connectivity to the site with enhanced transit amenities and changes to service.

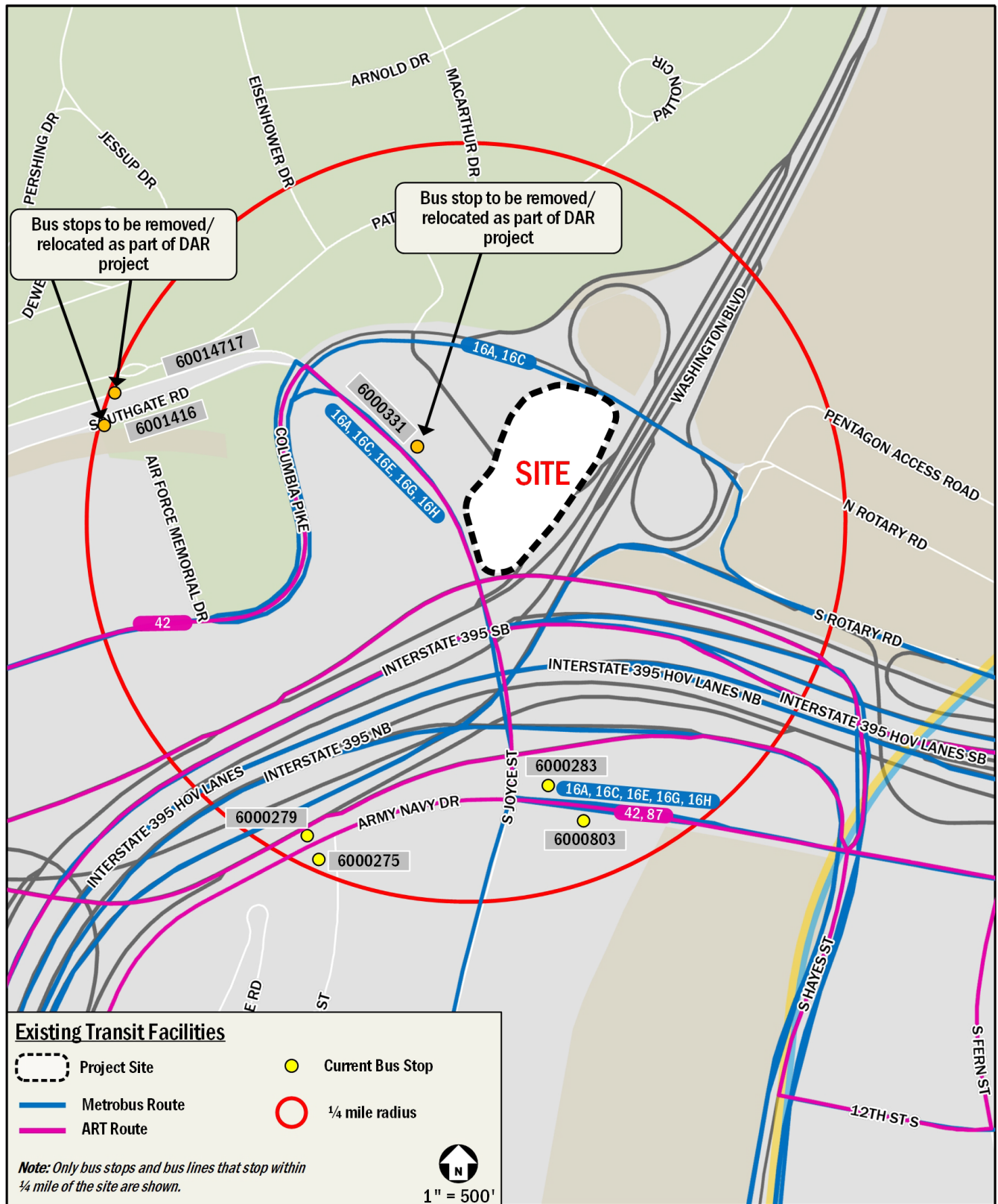


Figure 17: Existing Transit Service

Table 2: Bus Stop Inventory

Location	Stop ID	Routes Served	Features								Real Time Bus Display
			Sign	ADA Landing Pad	Sidewalk	Street Lighting	Info Case	Seating	Shelter	Trash	
Army Navy Dr (WB) & S Lynn St	6000279	87,87A, 87P	●		●		●				
Army Navy Dr (EB) & S Lynn St	6000275	87,87A, 87P	●	●	●		●				
Army Navy Dr (WB) & S Joyce St	6000283	42, 87, 87A, 87P, 16A, 16C, 16E, 16G, 16H	●	●	●		●				
Army Navy Dr (EB) & S Joyce St	6000803	42, 87, 87A, 87P, 16A, 16C, 16E, 16G, 16H	●	●	●	●	●				
Southgate Rd (WB) at Air Force Memorial	6001417	42, 16A, 16C, 16E, 16G, 16H									
Southgate Rd (EB) at Air Force Memorial	6001416	42, 16A, 16C, 16E, 16G, 16H									

*Includes bus stops within ¼-mile of the proposed development

Table 3: Bus Route Information

Route Number	Route Name	Service Hours	Headway	Walking Distance to Nearest Bus Stop
87, 87A 87P	Pentagon Metro - Army Navy Drive - Shirlington	5:50 AM - 11:32 PM	15 min	0.3 miles, 5 minutes
42	Ballston - Pentagon Line	6:00 AM - 8:38 PM	15 min	0.3 miles, 5 minutes
16A, 16C, 16E	Columbia Pike Line	4:33 AM - 2:44 AM	15-30 min	0.3 miles, 5 minutes
16H	Columbia Pike - Pentagon City Line	5:34 AM - 11: 20 PM	12-24 min	0.3 miles, 5 minutes

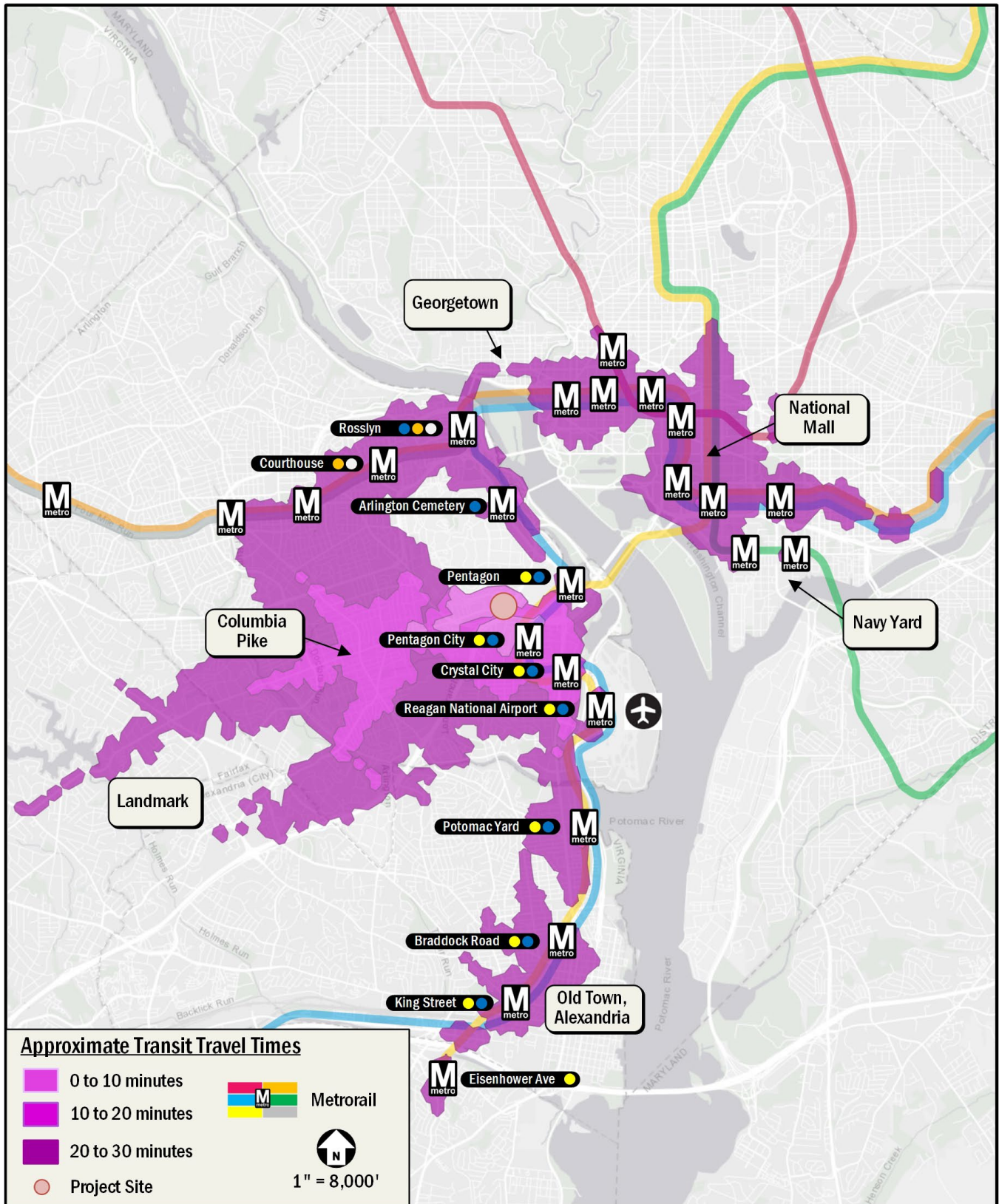


Figure 18: Approximate Transit Travel Times

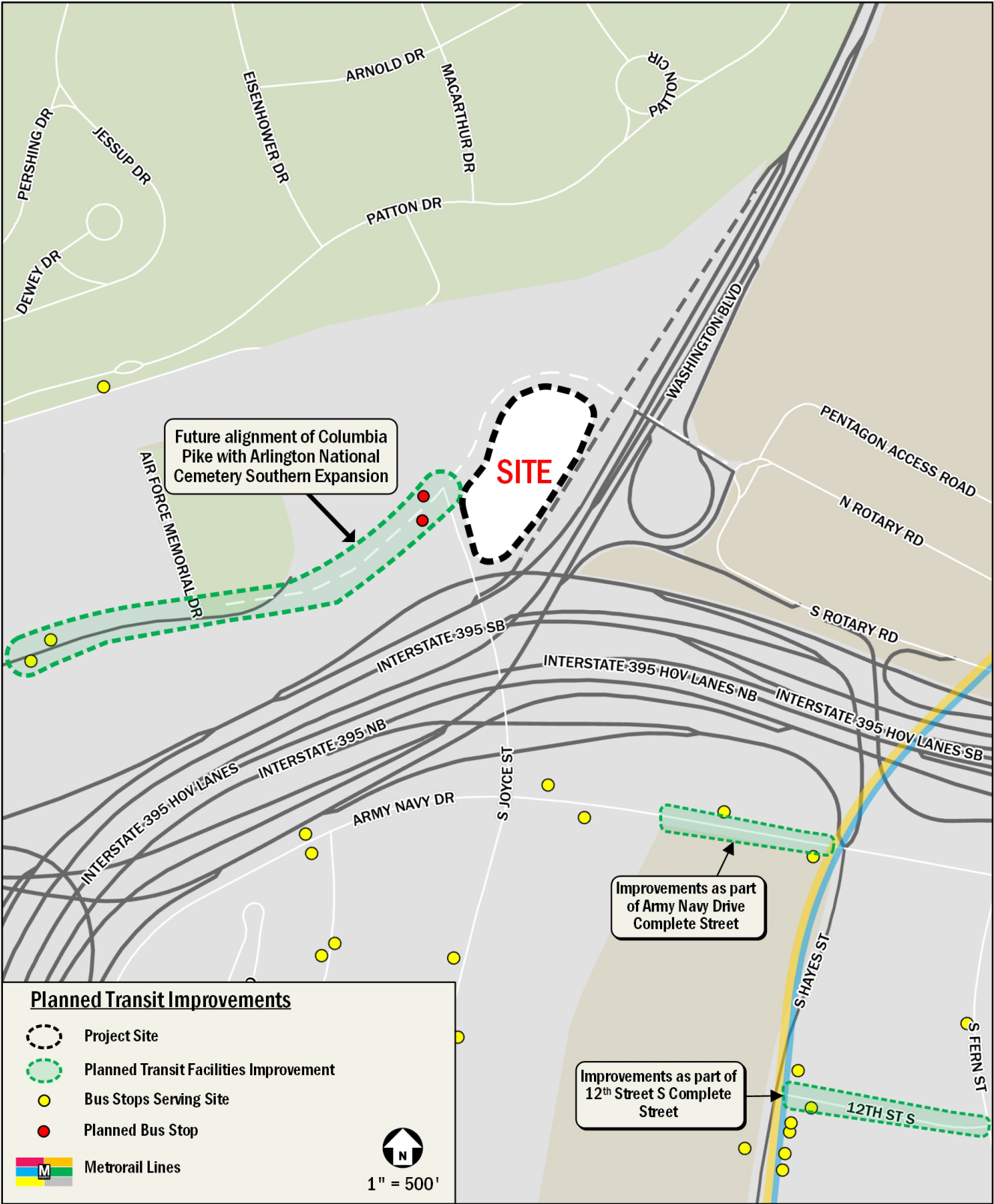


Figure 19: Planned Transit Improvements

Bicycle Facilities

This chapter summarizes existing and future bicycle access, reviews the quality of cycling routes to and from the site.

The following conclusions are reached within this chapter:

- The site has access to several on- and off-street bicycle facilities, including bicycle lanes on S Joyce Street and S Hayes Street, an off-street trail on the north side of Columbia Pike, and the Washington Boulevard Sidepath.
- Future planned projects in the vicinity of the site include bicycle lanes along Army Navy Drive, S Eads Street, and 12th Street S as part of the Army Navy Drive, S Eads Street, and 12th Street S Complete Street projects. These will further improve bicycle access and connectivity by upgrading bicycle facilities along these routes.
- The proposed development will provide on-site short-term bicycle parking. As part of the DAR project, an off-street cycle track will be constructed on the north side of Columbia Pike between Washington Boulevard and S Nash Street, providing bicycle connectivity to the site. The eastern end of this facility will connect users to the Washington Boulevard Sidepath and the future Arlington National Cemetery Wall Trail.

Existing Bicycle Facilities

The site has access to on-street bicycle facilities, including bicycle lanes on S Joyce Street, S Hayes Street, and Army Navy Drive. An off-street trail also runs along the north side of Columbia Pike between S Joyce Street and S Rotary Road, which connects to the Washington Boulevard Sidepath near the Pentagon 9/11 Memorial on the east side of Washington Boulevard. Figure 20 shows the existing facilities within the study area.

Arlington County publishes an annual Bicycle Comfort Level Map highlighting the most comfortable bicycle routes throughout Arlington County. The map uses a rating system of “perception of comfort” to show which routes are most comfortable. Routes are rated as ‘Easy’, ‘Medium’, ‘Challenging’, ‘Expert Level’, or ‘Prohibited’. The most recent publication of the map (2020) shows that the bicycle routes in the vicinity of the site are rated at a variety of difficulty levels. Among on-street facilities near the site, Army Navy Drive is rated ‘Challenging’, S Joyce Street is rated as ‘Medium’, Southgate Road is rated as ‘Easy’, and Columbia Pike west of S Joyce Street is rated as ‘Expert Level’. Since the Bicycle Comfort Level Map was most recently

published in 2020, these ratings may be subject to change after the completion of the DAR project.

No bicycle parking is provided along the perimeter of the site under existing conditions. Short-term bicycle racks are available at the Pentagon and Pentagon City Stations.

Figure 21 shows the 10-minute, 20-minute, and 30-minute bicycle travel shed for the proposed development. Within a 10-minute bicycle ride, the proposed development has access to several destinations including Arlington National Cemetery, public transportation stops, Metro stations served by the Blue and Yellow lines, the Crystal City VRE Station, retail zones, residential neighborhoods, and community amenities. Within a 20-minute bicycle ride, the proposed development has access to destinations in the District, Arlington, and Alexandria such as the Mount Vernon and Four Mile Run trails, Custis Trail, Arlington Memorial Bridge, Lincoln Memorial, residential neighborhoods, and retail zones. Within a 30-minute bicycle ride, the proposed development is accessible to most of Arlington and Alexandria, and several destinations in the District including Downtown, and the National Mall.

Capital Bikeshare

In addition to personal bicycles, the Capital Bikeshare program provides additional cycling options for residents and patrons of the proposed development. The Bikeshare program has placed over 550 Bikeshare stations across Washington, DC, Arlington County, VA, City of Alexandria, VA, Montgomery County, MD, Fairfax County, VA, Prince George’s County MD, and most recently the City of Falls Church, VA, with over 4,500 bicycles provided. The proposed site is located within a half-mile walking radius to Pentagon City. There is one (1) existing Capital Bikeshare station with 16 available bicycle docks within a half-mile of the site, located along S Joyce Street. The greater Pentagon City and Crystal City area have access to more Capital Bikeshare stations which provide greater connectivity to the entire Washington Metropolitan Area.

E-Scooters and Dockless E-Bicycles

Five (5) electric-assist scooter (e-scooter) and electric-assist bicycle (e-bike) companies provide Shared Mobility Device (SMD) service in Arlington County: Bird, Spin, Superpedestrian, Veo Access, and Lime. These SMDs are provided by private companies that give registered users access to a variety of e-scooter and e-bike options. These devices are used through

each company-specific mobile phone application. Many SMDs do not have designated stations where pick-up/drop-off activities occur like with Capital Bikeshare; instead, many SMDs are parked in public space, most commonly in the “furniture zone” (the portion of sidewalk between where people walk and the curb, often where you’ll find other street signs, street furniture, trees, parking meters, etc.). At this time, SMD pilot/demonstration programs are underway in Arlington County, the District, Fairfax County, the City of Alexandria, and Montgomery County.

Planned Bicycle Facilities

Existing bike facilities have been recommended by the Arlington Master Transportation Plan to be upgraded in the future, as shown on Figure 11. The plan makes the following recommendations:

- Implement wide multi-use trails, or wide sidewalks, along at least one side of Columbia Pike, in the areas east of S. Wayne Street and west of Four Mile Run, to serve both bicycle and pedestrian travel. Improvements will be implemented in conjunction with other streetscape improvements and the east end realignment of Columbia Pike.
- Construct a trail parallel to the east wall of Arlington Cemetery to link Columbia Pike to Memorial Drive. Connecting the trail installation with the reconfiguration of the east end of Columbia Pike.
- Reconstruct Army Navy Drive to include bi-directional, protected bicycle lanes from S Joyce Street to 12th Street S.
- Construct an off-street cycle track connecting the planned Army Navy Drive protected bicycle lane at 12th Street S to 18th Street S and the Crystal City Metrorail station.
- Upgrade the existing bicycle lanes on S Joyce Street and 15th Street S between Army Navy Drive and S Hayes Street to include more separation from motor vehicle traffic.
- Develop an enhanced bicycle facility on S Fern Street between the Pentagon reservation and 18th Street South.

The Crystal City Sector Plan makes the following recommendations for roadways in the vicinity of the site:

- Extending on-street routes along S Fern Street;
- Adding on-street routes along 12th Street S from S Hayes Street to S Clark Street; and

- Adding bicycle lanes along Army Navy Drive between S Hayes Street and 12th Street S.

The Pentagon City Sector Plan makes the following recommendations for roadways in the vicinity of the site:

- Adding a separated bikeway along S Hayes Street.
- Adding a separated bikeway along S Joyce Street.
- Optimize connections to planned bike facility improvements along Army Navy Drive and Columbia Pike.

As part of the DAR project, an off-street cycle track will be constructed on the north side of Columbia Pike between Washington Boulevard and S Nash Street. The eastern end of this facility will connect users to the Washington Boulevard Sidepath and the future Arlington National Cemetery Wall Trail.

Several other bicycle infrastructure improvements are planned in the study area as parts of other planned projects:

- As part of the S Eads Street Complete Street project, buffered bicycle lanes will also be installed on the east side of S Eads Street from Army Navy Drive to 12th Street S.
- As part of the Army Navy Drive Complete Street project, separated two-way bicycle lanes will be installed along the south side of Army Navy Drive between S Joyce Street and 12th Street S.
- As part of the PenPlace development, a northbound protected bicycle lane along the eastern side between Army Navy Drive and 12th Street S and a southbound protected bicycle lane along the western side between Army Navy Drive and 11th Street S will be provided.

Planned bike facilities are shown in Figure 22. The proposed off-street trail shown in the figure reflects the routing as shown in in the MTP Bicycle Element; however, this facility is being implemented as part of the DAR project as an off-street cycle track on the north side of Columbia Pike.

As part of the proposed development, short-term bicycle parking spaces will be provided in the landing area located across the internal driveway from the building, as shown on Figure 6. Bicycle access to the site is primarily expected to occur via the off-street cycle track being constructed on the north side of Columbia Pike as part of the DAR project.

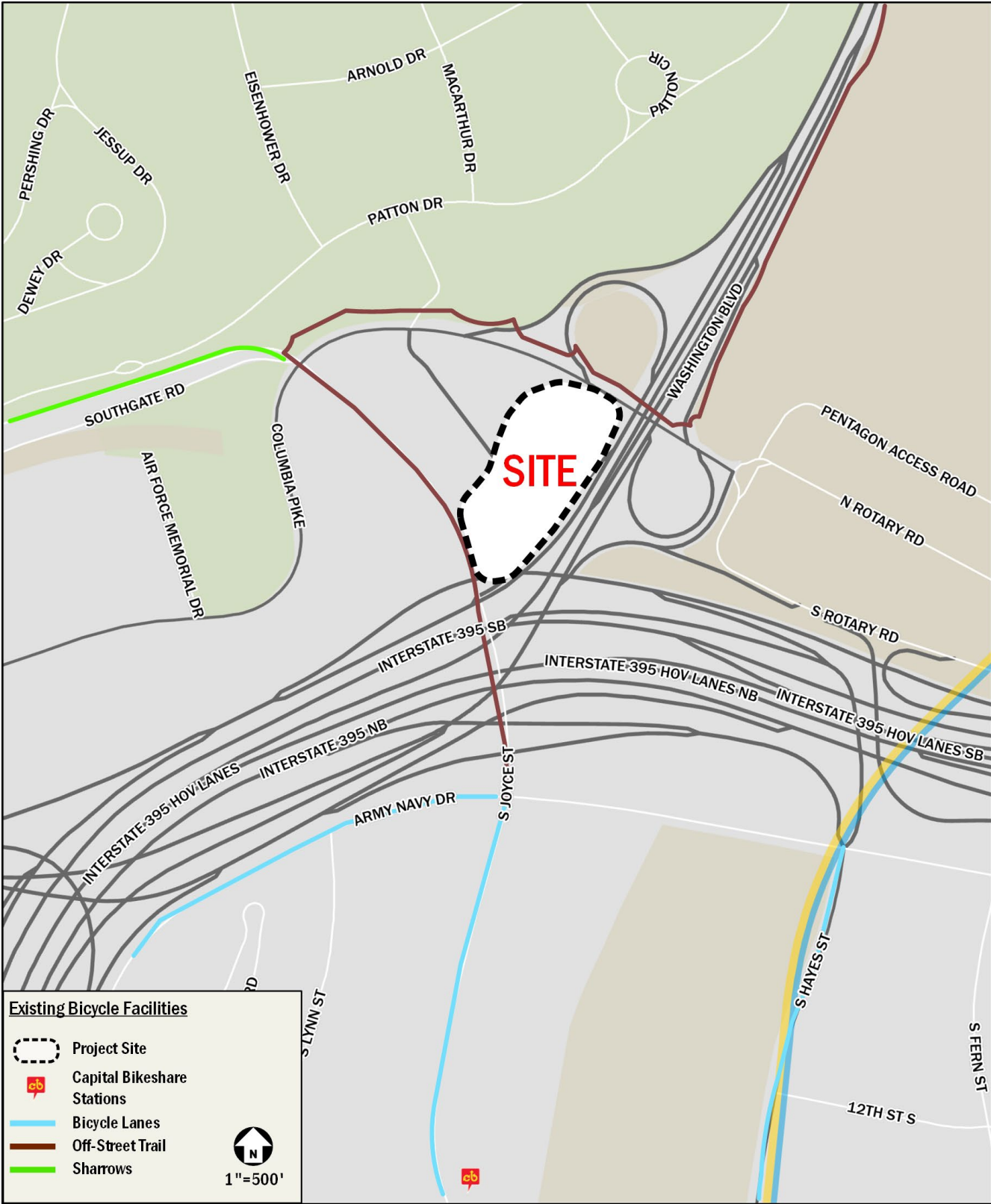


Figure 20: Existing Bicycle Facilities

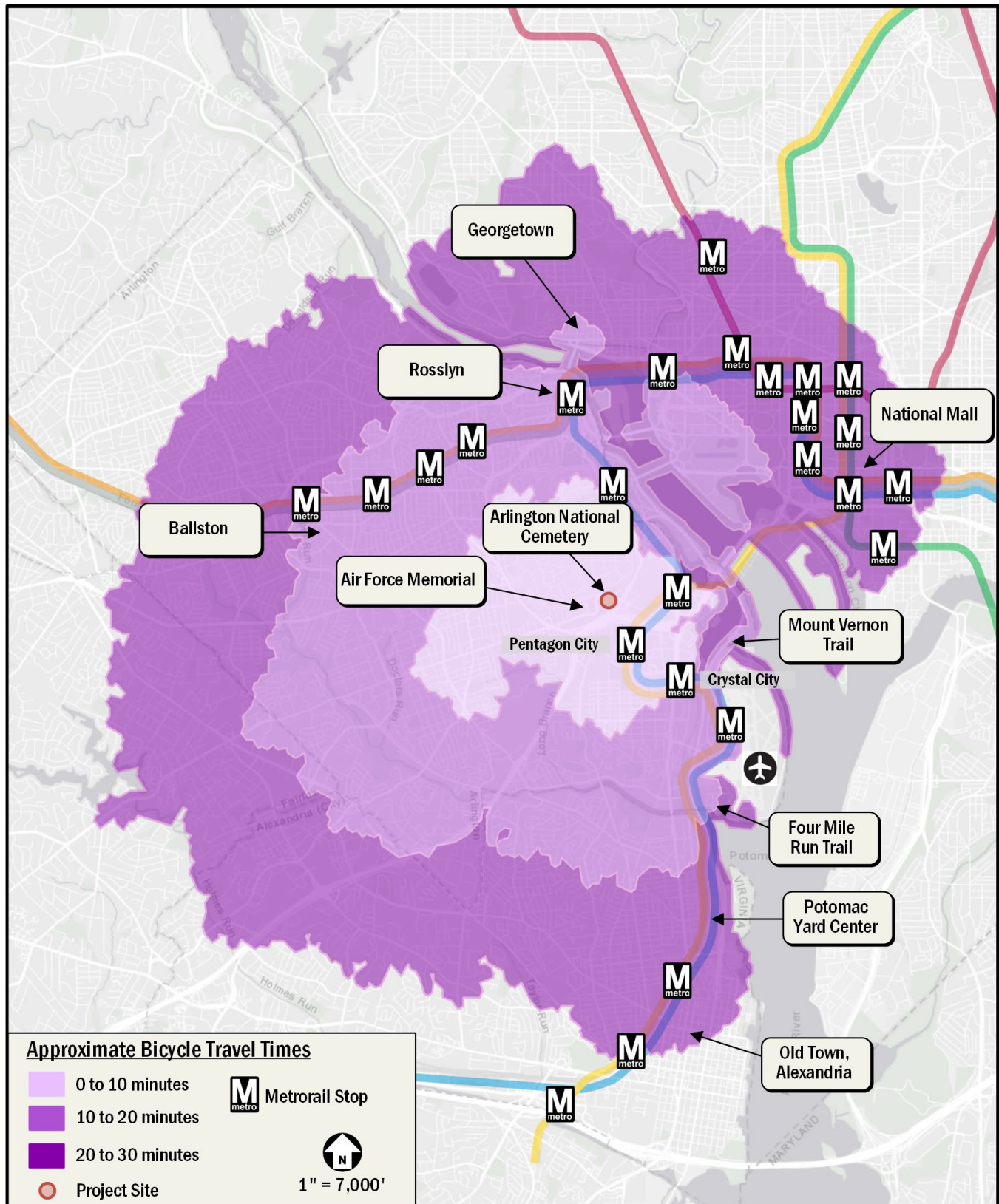


Figure 21: Approximate Bicycle Travel Times

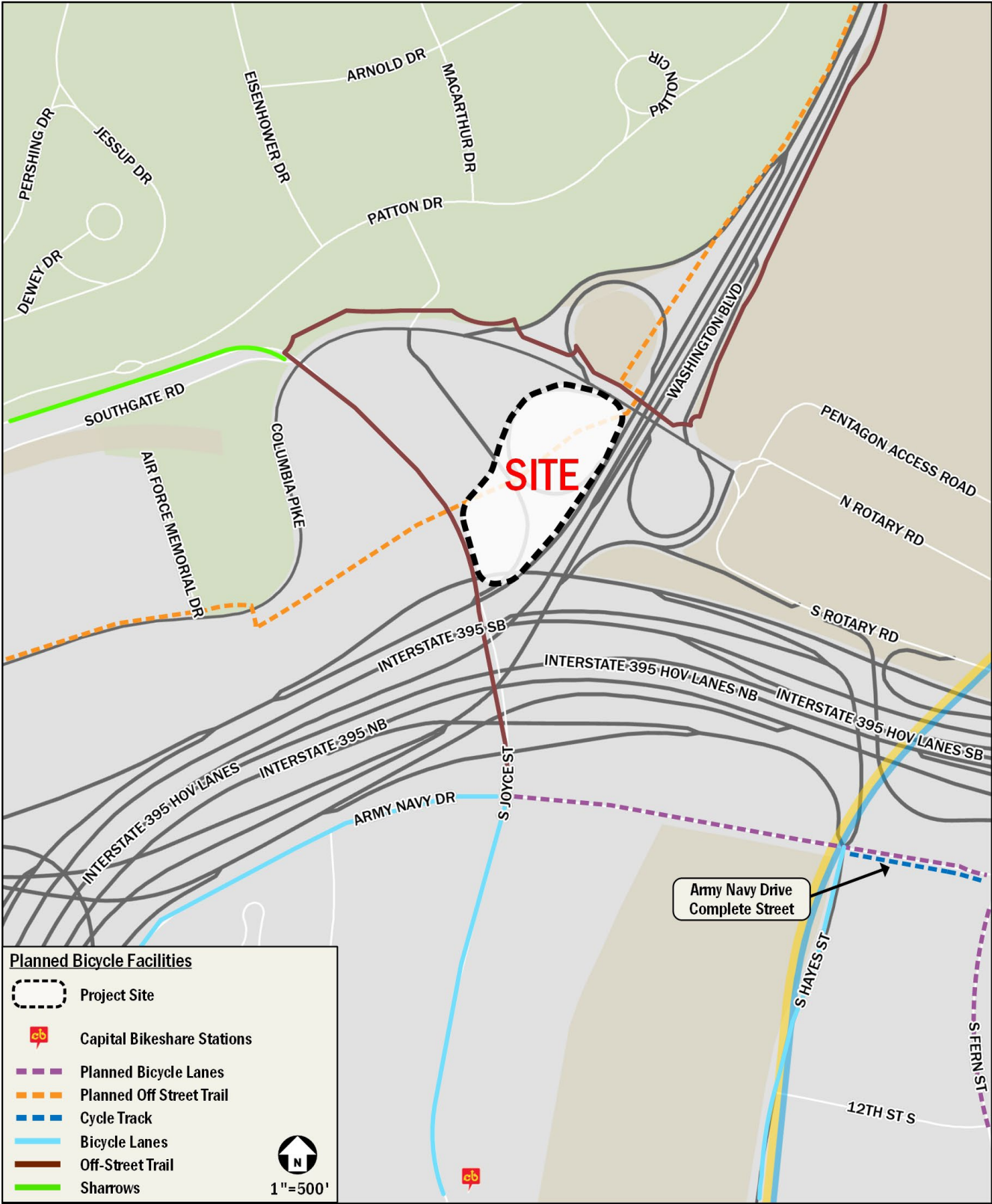


Figure 22: Future Bicycle Facilities

Pedestrian Facilities

This chapter summarizes the existing and future pedestrian access to the site and reviews walking routes to and from the site.

The following conclusions are reached within this chapter:

- The existing pedestrian infrastructure surrounding the site provides an adequate walking environment. There are sidewalks along the majority of primary routes to pedestrian destinations with few gaps in the system. I-395 and Washington Boulevard to the south and east of the site are barriers to pedestrian connectivity.
- Planned and proposed improvements to the pedestrian infrastructure surrounding the site will improve pedestrian comfort and connectivity.
- Pedestrian improvements being implemented as part of the DAR project will provide a more inviting pedestrian environment by adding new sidewalks and streetscape features along the site's frontage that meet or exceed Arlington County requirements.

Pedestrian Study Area

Pedestrian facilities within a quarter-mile of the site were evaluated as well as routes to nearby transit facilities, including routes to Pentagon City and Crystal City to the southeast. The site is accessible to transit options such as the one (1) bus stops along S Joyce Street south of the site. In general, existing pedestrian facilities surrounding the site provide comfortable walking routes to and from nearby transit options. However, there are some areas of concern within the study area that negatively impact the quality and attractiveness of the walking environment. This includes physical barriers that limit pedestrian connectivity.

Figure 23 shows expected pedestrian pathways, walking time and distances, and barriers or areas of concern. Notably, I-395 and Washington Boulevard to the south and east of the site are barriers to pedestrian connectivity to the Pentagon and Pentagon City areas. It is anticipated that the major walking routes to and from the site will be along S Joyce Street (providing connections to the Pentagon City neighborhood and Metro station) and Columbia Pike (providing connections to the Pentagon 9/11 Memorial and Pentagon Metro)

Figure 24 shows the 10-minute, 20-minute, and 30-minute walk travel shed for the proposed development. Within a 10-minute

walk, the proposed development has access to several destinations including public transportation stops, the Air Force Memorial, and the Pentagon. Within a 20-minute walk, the proposed development has access to several Metro stations served by the Blue and Yellow lines, the Pentagon City Shops, Virginia Highlands Park, retail zones, nearby residential neighborhoods, and community amenities. Within a 30-minute walk, the proposed development has access to destinations including Crystal City retail and office buildings, and residential neighborhoods to the south and west.

Existing Pedestrian Facilities

A review of pedestrian facilities surrounding the proposed development shows that many facilities provide an adequate walking environment. Figure 25 shows a detailed inventory of the existing pedestrian infrastructure surrounding the site. Sidewalks, crosswalks, and curb ramps are evaluated based on the guidelines set forth by the Arlington County, and ADA standards.

ADA standards require that curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, curb ramps shared between two crosswalks are not desired. As shown in Figure 25, the majority of curb ramps meet ADA standards.

Within the study area, the majority of roadways have existing sidewalks on both sides, with some deficiencies. Of note, portions of the sidewalk along the east side of S Joyce Street. The Arlington National Cemetery Expansion project will realign the principal arterial Columbia Pike (VA-244) which will connect the pedestrian facilities to the proposed project site. Despite some deficiencies, all primary pedestrian destinations are accessible via routes with sidewalks, most of which meet Arlington County and ADA standards.

Overall, the site is situated outside an urban transportation network, with adequate pedestrian access. Figure 26 shows the existing pedestrian peak hour volumes at study area intersections.

Planned Pedestrian Facilities

As part of the DAR project, pedestrian facilities around the perimeter of the site will be improved to meet or exceed Arlington County and ADA standards. Planned and proposed pedestrian improvements are shown in Figure 27.

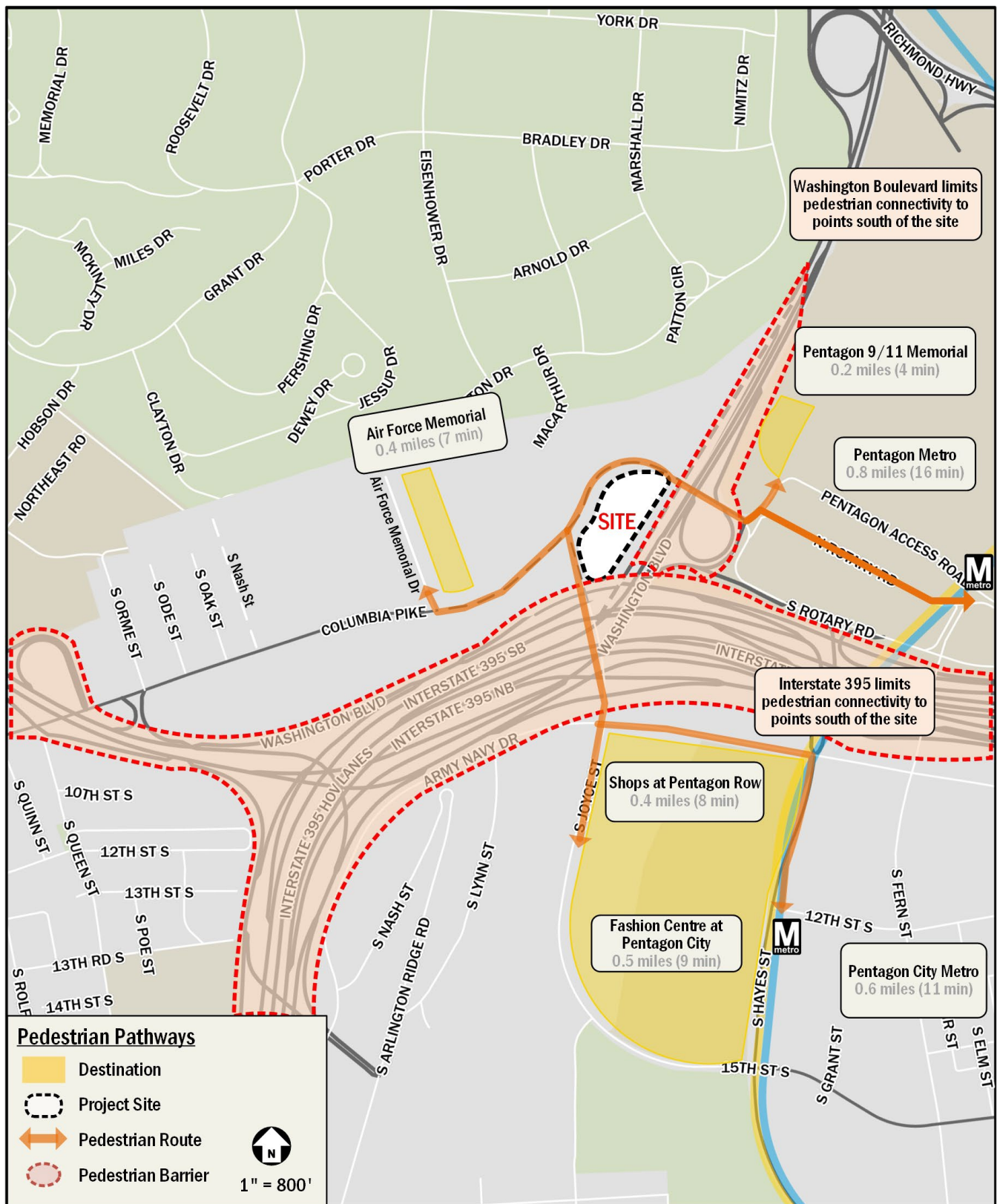


Figure 23: Pedestrian Pathways

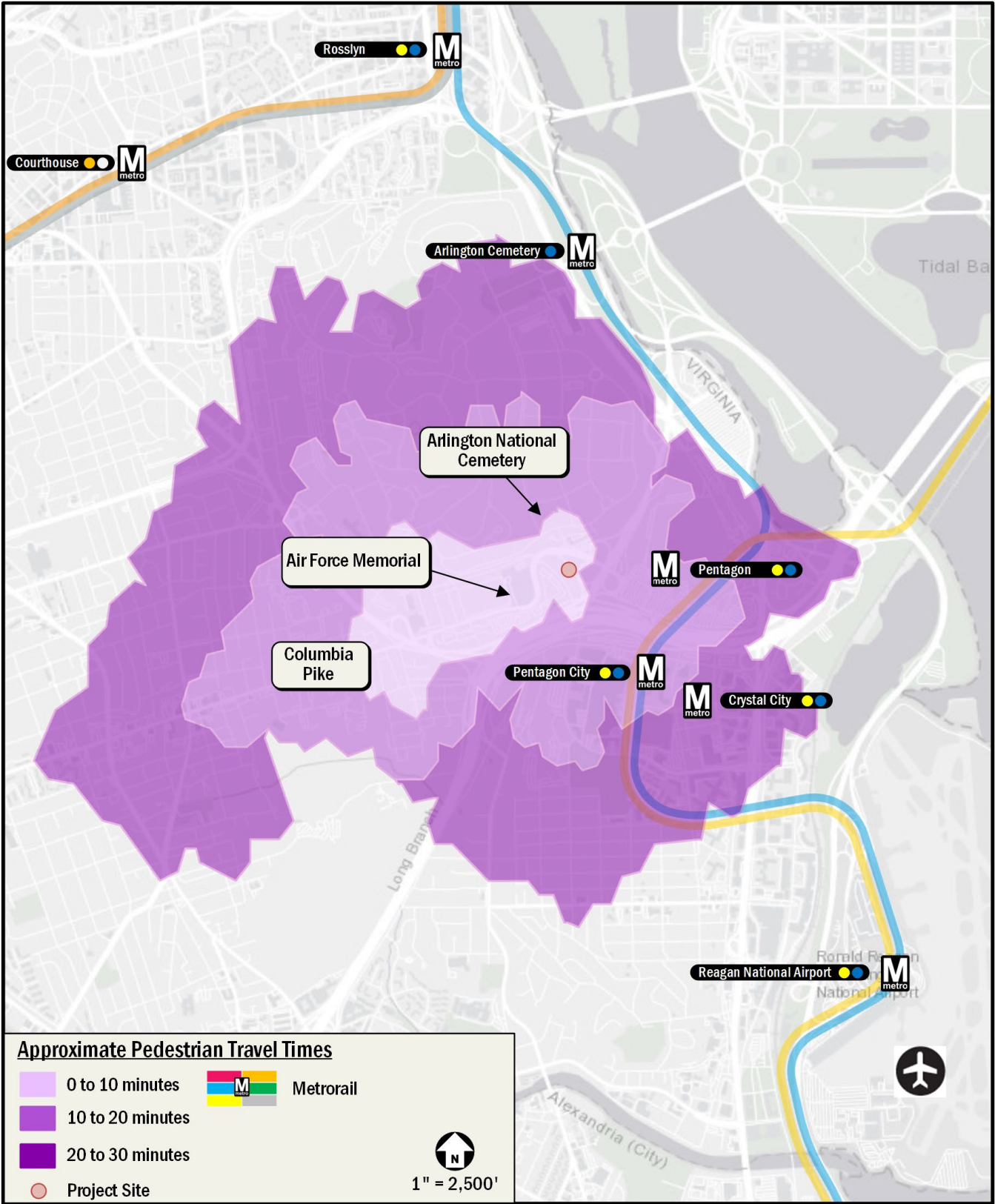


Figure 24: Approximate Pedestrian Travel Times

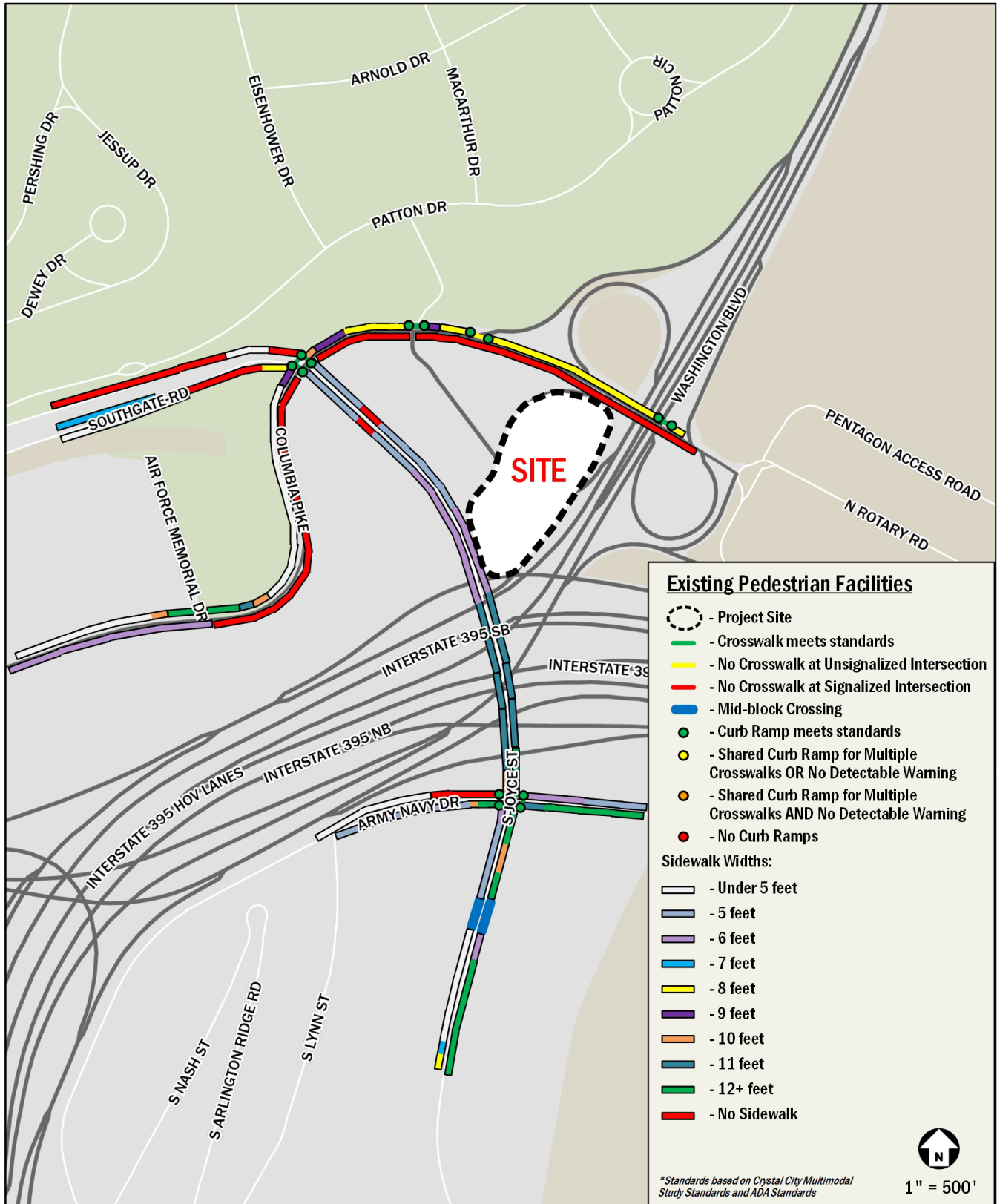


Figure 25: Existing Pedestrian Facilities

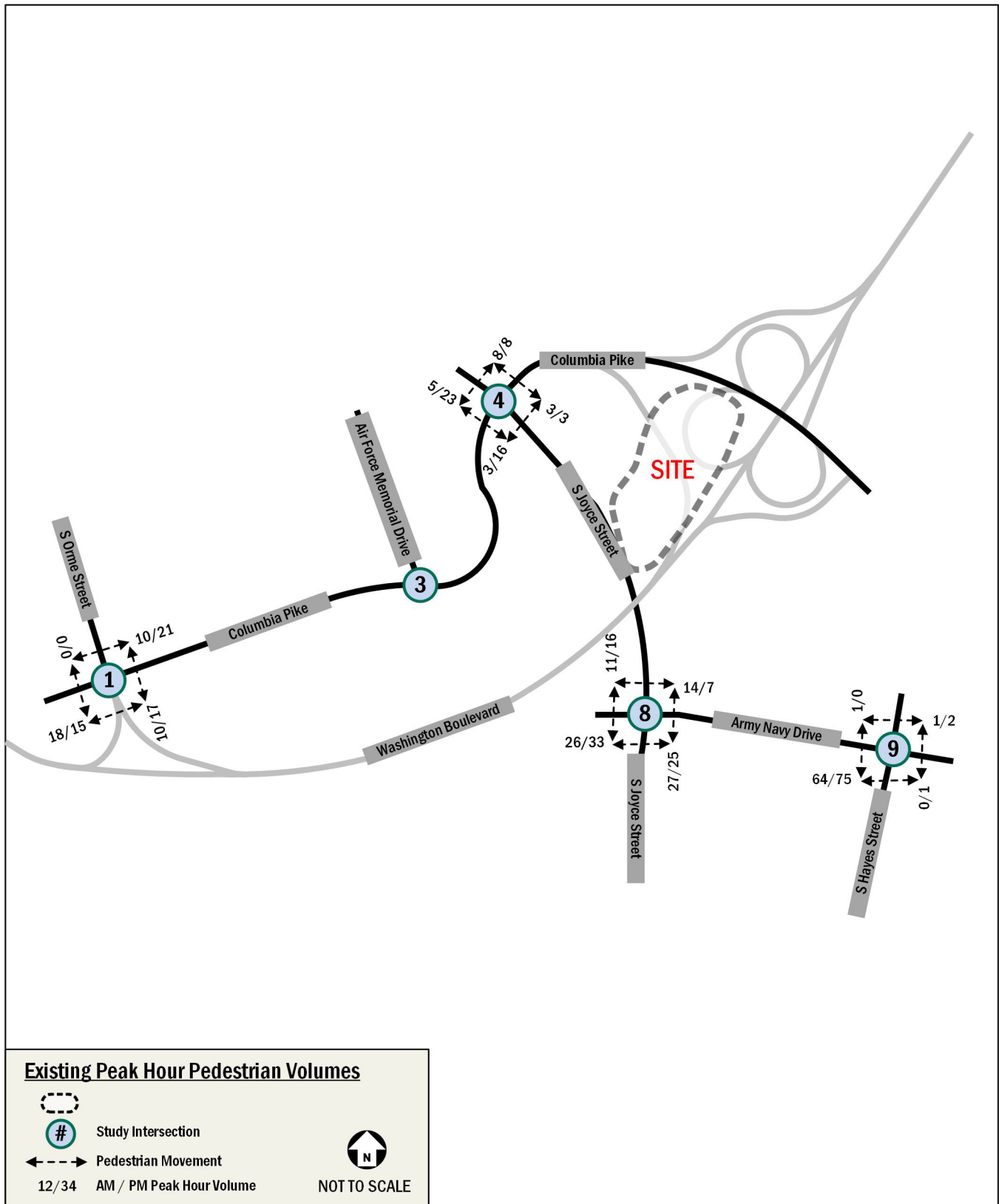


Figure 26: 2022 Existing Peak Hour Pedestrian Volumes



Figure 27: Planned Pedestrian Improvements

Travel Demand Assumptions

This chapter outlines the transportation demand of the proposed Pentagon Memorial Visitor Education Center development. It reviews the expected mode splits, multimodal trip generation, and the trip distribution and routing assumptions, which forms the basis for the chapters that follow.

Mode Split Methodology

Mode split (also called mode share) is the percentage of travelers using a particular type (or mode) of transportation when traveling. Mode splits were identified for each potential visitor type to the Visitor Education Center.

In general, because the walking routes from the two closest Metrorail stations require crossing under a freeway (I-395 for visitors accessing the site via the Pentagon City station and Washington Boulevard for visitors accessing the site via the Pentagon station), the anticipated auto mode splits for visitor (non-staff) trips are greater than they would otherwise be without those pedestrian barriers.

Tour group attendees were assumed to arrive via a private tour bus. For non-tour group visitor center attendees, the *Visitor Education Center Attendance Potential Study* projects that 15% of non-tour group resident attendees would be school trips. Outside of those trips, 25% of resident attendees are anticipated to arrive via transit, and 60% are anticipated to arrive by auto (either by driving and parking or via TNC/Taxi).

For non-tour group tourist attendees, daytime event attendees, and nighttime event attendees, it is anticipated that 65% of visitors will arrive by auto (either by driving and parking or by TNC/Taxi), 30% will use transit, and 5% will bike or walk.

For staff, mode splits were based on Arlington County Mode Share Assumptions for Pentagon City, the Crystal City Multimodal Transportation Study, the WMATA Ridership Survey, and Census data at the TAD level for commuters with destinations in the project TAD. Figure 28 shows the TAD used in the analysis in relation to the proposed development and Figure 29 shows the destinations of driving commuters with destinations in the project TAD. It is anticipated that 30% of staff trips will arrive by auto, 61% will use transit, and 9% will bike or walk. In general, it is expected that a greater portion of staff trips will be by transit than visitor trips, as staff would be expected to be more familiar with the local transit system than visitors. Table 7 shows the mode split percentages by group. Table 4

summarizes the data that was used alongside the projections in the *Visitor Education Center Attendance Potential Study* to establish mode split assumptions.

Table 4: Summary of Mode Split Data

Information Source	Mode				
	SOV	Carpool	Transit	Bike/Walk	Telecommute/Other
Census Transportation Planning Products (TAZ 11496)	47%	11%	40%	0%	1%
22202 Transportation Study - Journey to Work (for Crystal City Core)	34%	3%	50%	9%	4%
22202 Transportation Study - Journey to Work (for Pentagon City Core)	28%	2%	53%	7%	10%
WMATA Ridership Survey (average for Crystal City Station Area)	47%		46%	7%	---
Arlington County Mode Share Assumptions for Pentagon City (Productions)	27%		64%	9%	---
Arlington County Mode Share Assumptions for Pentagon City (Attractions)	30%		61%	9%	---

Trip Generation Methodology

Trip generation calculations are based on the projected number of visitor center attendees per day, the projected number of conference center and special events attendees, and the projected number of employees and PMVEC staff. Traditional trip generation using the Institute of Transportation Engineers' *Trip Generation Manual* was not used as no comparable land use is included in the *Trip Generation Manual*. A multi-step process was formulated to determine the trip generation of the proposed site:

1. Daily person trips to the site were estimated by visitor type, based on projected attendance for the visitor education center as provided in the *Visitor Education Center Attendance Potential Study* (March 2023) prepared by ConsultEcon, Inc.; projected event sizes for the multi-purpose conference center spaces as provided in the *Proposed Visitor Education Center Sustainability Analysis* (August 2019) prepared by KPMG; and projected staff needs as provided by the project design team. Table 5 shows the estimated daily

person trips by visitor type. The visitor types accounted for in the analysis include:

- a. Tour Group Attendees – People visiting the Visitor Education Center as part of an organized tour group arriving via private bus or shuttle.
- b. Non-Tour Group Resident Attendees – People visiting the Visitor Education Center not as part of an organized tour group, who also live in the area. This visitor type includes group trips from local schools.
- c. Non-Tour Group Tourist Attendees – People visiting the Visitor Education Center not as part of an organized tour group, who are visiting from out of town.
- d. Event and Facility Rental Daytime Attendees – Trips for the multi-purpose conference center use for daytime events, including corporate meetings, defense contractor meetings in flex space, and non-profit/governmental meetings/lectures/conferences.
- e. Event and Facility Rental Nighttime Attendees – People visiting the site for the multi-purpose conference center use for nighttime banquet events. Per the KPMG report, a total of 10 to 15 nighttime events are anticipated each year. Since these events would be infrequent, they are not assumed to occur on a typical weekday and thus are not proposed to be included in the scenarios for capacity analysis.

2. Daily person trips by visitor type were converted to hourly person trips based on a projected hourly distribution of trips, based on:

- a. Hourly distribution of trips for uses with comparable arrival patterns provided in Trip Generation, 11th Edition published by the Institute of Transportation Engineers (ITE).
- b. Google Maps data on hourly visitation patterns of similar facilities in the area.

- c. Typical schedules of events and tour visits, including an assumed average visit time of 90 minutes for the visitor education center.

The hourly distribution of trips is shown in Table 6.

3. Mode splits and vehicular occupancies were applied to the hourly person trips to determine hourly trips by mode. The mode splits utilized in the analysis are shown in Table 7 and the vehicular occupancies utilized are shown in Table 8.
4. Peak hour trips were selected from the hourly trips by mode based on the peak hour identified in the collected traffic data. For the AM Peak Hour (8:15 AM to 9:15 AM), a weighted average of the 8-9 AM and 9-10 AM hourly trips was used to identify peak hour trip generation. For the PM Peak Hour (4:30 PM to 5:30 PM), a weighted average of the 4-5 PM and 5-6 PM hourly trips was used.

The trip generation developed using this methodology was compared to a more traditional trip generation using methodology outlined in the Institute of Transportation Engineers' (ITE) Trip Generation, 11th Edition. The ITE-based methodology results in fewer estimated peak hour trips generated by the proposed development, largely because the proposed development includes unique land uses that are not accounted for in the ITE manual. In order to provide a conservative analysis, the methodology based on projected attendance was used. Full discussion of the trip generation methodology, a comparison to ITE-based methodology, and detailed trip generation calculations are provided in the MMTA scoping form included in the Technical Appendix.

A summary of the trip generation for the proposed development is shown in Table 10 for the weekday morning peak hour and afternoon peak hours.

Table 5: Estimated Daily Person Trips by Visitor Type

Visitor Center Attendees - Tour Groups ¹	Non-Group Visitor Center Attendees ¹		Event and Facility Rental Attendees		Staff/Employees ⁴	Total Attendance
	Residents	Tourists	Daytime ²	Nighttime ³		
808	386	623	350	300	100	2,567

Table 6: Hourly Distribution (%) of Entering and Exiting Trips

Time Period	Visitor Center Attendees - Tour Groups ¹		Non-Group Visitor Center Attendees ¹				Event and Facility Rental Attendees				Staff/Employees ²	
	% of 24-Hour Traffic		Residents % of 24-Hour Traffic		Tourists % of 24-Hour Traffic		Daytime % of 24-Hour Traffic ³		Nighttime % of 24-Hour Traffic ⁴		% of 24-Hour Traffic	
	Entering	Exiting	Entering	Exiting	Entering	Exiting	Entering	Exiting	Entering	Exiting	Entering	Exiting
12-1 AM	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1-2 AM	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2-3 AM	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3-4 AM	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4-5 AM	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5-6 AM	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6-7 AM	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	1%
7-8 AM	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	14%	2%
8-9 AM	4%	0%	4%	0%	4%	0%	18%	3%	0%	0%	14%	3%
9-10 AM	12%	2%	12%	2%	12%	2%	22%	3%	0%	0%	6%	4%
10-11 AM	14%	6%	14%	6%	14%	6%	12%	4%	0%	0%	5%	6%
11-12 PM	14%	14%	14%	14%	14%	14%	8%	10%	0%	0%	6%	10%
12-1 PM	14%	16%	14%	16%	14%	16%	10%	10%	0%	0%	10%	10%
1-2 PM	14%	16%	14%	16%	14%	16%	7%	8%	0%	0%	9%	7%
2-3 PM	12%	16%	12%	16%	12%	16%	7%	6%	0%	0%	8%	6%
3-4 PM	12%	14%	12%	14%	12%	14%	7%	16%	0%	0%	7%	8%
4-5 PM	4%	12%	4%	12%	4%	12%	2%	16%	10%	0%	5%	15%
5-6 PM	0%	4%	0%	4%	0%	4%	2%	20%	30%	0%	4%	16%
6-7 PM	0%	0%	0%	0%	0%	0%	0%	4%	55%	0%	2%	3%
7-8 PM	0%	0%	0%	0%	0%	0%	0%	0%	5%	5%	1%	2%
8-9 PM	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	1%	1%
9-10 PM	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	1%	2%
10-11 PM	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	2%
11-12 AM	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

Table 7: Mode Splits Proposed for MMTA by Visitor Type

Visitor Type	Mode				
	Auto	Transit	Bike	Walk	Other (Private Bus/Shuttle)
Visitor Center Attendees - Tour Groups	0%	0%	0%	0%	100%
Non-Group Visitor Center Attendees (Residents)	60%	25%	0%	0%	15%
Non-Group Visitor Center Attendees (Tourists)	65%	30%	1%	4%	0%

Event and Facility Rental Attendees (Daytime Events)	65%	30%	1%	4%	0%
Event and Facility Rental Attendees (Nighttime Events)	65%	30%	1%	4%	0%
Staff/Employees	30%	61%	3%	6%	0%

Table 8: Vehicular Occupancy by Visitor Type

Vehicular Occupancy (people per vehicle)	Visitor Center Attendees - Tour Groups	Non-Group Visitor Center Attendees		Event and Facility Rental Attendees		Staff/Employees
		Residents	Tourists	Daytime	Nighttime	
	48 ppl/veh ¹	30 ppl/veh ¹ (School Groups) 2.10 ppl/veh ² (Other Resident Visitors)	2.10 ppl/veh ²	1.18 ppl/veh ²	1.18 ppl/veh ²	1.18 ppl/veh ²

Sources:

1. Based on Tour Group sizes Visitor Education Center Attendance Potential Study (March 2023) prepared by ConsultEcon, Inc. A weighted average of school and adult tour group sizes was used for the Tour Group vehicular occupancy.
2. 2017 National Household Travel Survey, Table 16

Table 9: Hourly Trips by Mode

Time Period	Vehicle Trips (veh/hr)			Transit Trips (ppl/hr)			Bike Trips (ppl/hr)			Walk Trips (ppl/hr)		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
12-1 AM	0	0	0	0	0	0	0	0	0	0	0	0
1-2 AM	0	0	0	0	0	0	0	0	0	0	0	0
2-3 AM	0	0	0	0	0	0	0	0	0	0	0	0
3-4 AM	0	0	0	0	0	0	0	0	0	0	0	0
4-5 AM	0	0	0	0	0	0	0	0	0	0	0	0
5-6 AM	0	0	0	0	0	0	0	0	0	0	0	0
6-7 AM	1	0	1	3	0	3	0	0	0	0	0	0
7-8 AM	13	1	14	14	1	15	1	0	1	2	0	2
8-9 AM	52	7	59	39	5	44	1	0	1	4	1	5
9-10 AM	84	15	99	61	11	72	2	0	2	6	1	7
10-11 AM	71	30	101	56	25	81	1	1	2	5	2	7
11-12 PM	63	68	131	52	56	108	1	2	3	5	6	11
12-1 PM	68	74	142	56	62	118	2	2	4	6	6	12
1-2 PM	62	70	132	53	58	111	1	1	2	5	6	11
2-3 PM	56	66	122	46	56	102	1	1	2	4	5	9
3-4 PM	56	79	135	46	62	108	1	2	3	4	6	10
4-5 PM	19	75	94	17	60	77	0	2	2	2	6	8
5-6 PM	5	57	62	5	42	47	0	1	1	1	5	6
6-7 PM	0	8	8	1	6	7	0	0	0	0	1	1
7-8 PM	0	1	1	1	1	2	0	0	0	0	0	0
8-9 PM	0	0	0	0	1	1	0	0	0	0	0	0
9-10 PM	0	0	0	0	1	1	0	0	0	0	0	0
10-11 PM	0	1	1	0	1	1	0	0	0	0	0	0
11-12 AM	0	0	0	0	0	0	0	0	0	0	0	0
Total	550	552	1,102	450	448	898	11	12	23	44	45	89

Table 10: Multi-modal Trip Generation

Mode	Visitor Type	AM Peak Hour			PM Peak Hour			Daily
		In	Out	Total	In	Out	Total	Total
Auto	Tour Groups	2 veh/hr	1 veh/hr	3 veh/hr	1 veh/hr	2 veh/hr	3 veh/hr	45 veh
	Non-Group Attendees (Residents)	8 veh/hr	1 veh/hr	9 veh/hr	3 veh/hr	10 veh/hr	13 veh/hr	239 veh
	Non-Group Attendees (Tourists)	12 veh/hr	1 veh/hr	13 veh/hr	4 veh/hr	16 veh/hr	20 veh/hr	386 veh
	Event and Facility Rental Attendees (Daytime)	37 veh/hr	6 veh/hr	43 veh/hr	4 veh/hr	35 veh/hr	39 veh/hr	386 veh
	Staff/Employees	4 veh/hr	1 veh/hr	5 veh/hr	2 veh/hr	4 veh/hr	6 veh/hr	51 veh
	Total Proposed	63 veh/hr	10 veh/hr	73 veh/hr	14 veh/hr	67 veh/hr	81 veh/hr	1106 veh
Transit	Tour Groups	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl
	Non-Group Attendees (Residents)	6 ppl/hr	1 ppl/hr	7 ppl/hr	2 ppl/hr	8 ppl/hr	10 ppl/hr	193 ppl
	Non-Group Attendees (Tourists)	12 ppl/hr	1 ppl/hr	13 ppl/hr	4 ppl/hr	15 ppl/hr	19 ppl/hr	374 ppl
	Event and Facility Rental Attendees (Daytime)	20 ppl/hr	4 ppl/hr	24 ppl/hr	3 ppl/hr	19 ppl/hr	22 ppl/hr	210 ppl
	Staff/Employees	8 ppl/hr	3 ppl/hr	11 ppl/hr	3 ppl/hr	10 ppl/hr	13 ppl/hr	122 ppl
	Total Proposed	46 ppl/hr	9 ppl/hr	55 ppl/hr	12 ppl/hr	52 ppl/hr	64 ppl/hr	899 ppl
Bike	Tour Groups	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl
	Non-Group Attendees (Residents)	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl
	Non-Group Attendees (Tourists)	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	12 ppl
	Event and Facility Rental Attendees (Daytime)	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	7 ppl
	Staff/Employees	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	6 ppl
	Total Proposed	3 ppl/hr	3 ppl/hr	6 ppl/hr	3 ppl/hr	3 ppl/hr	6 ppl/hr	25 ppl
Walk	Tour Groups	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl
	Non-Group Attendees (Residents)	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl/hr	0 ppl
	Non-Group Attendees (Tourists)	2 ppl/hr	1 ppl/hr	3 ppl/hr	1 ppl/hr	2 ppl/hr	3 ppl/hr	50 ppl
	Event and Facility Rental Attendees (Daytime)	3 ppl/hr	1 ppl/hr	4 ppl/hr	1 ppl/hr	3 ppl/hr	4 ppl/hr	28 ppl
	Staff/Employees	1 ppl/hr	1 ppl/hr	2 ppl/hr	1 ppl/hr	1 ppl/hr	2 ppl/hr	12 ppl
	Total Proposed	6 ppl/hr	3 ppl/hr	9 ppl/hr	3 ppl/hr	6 ppl/hr	9 ppl/hr	90 ppl

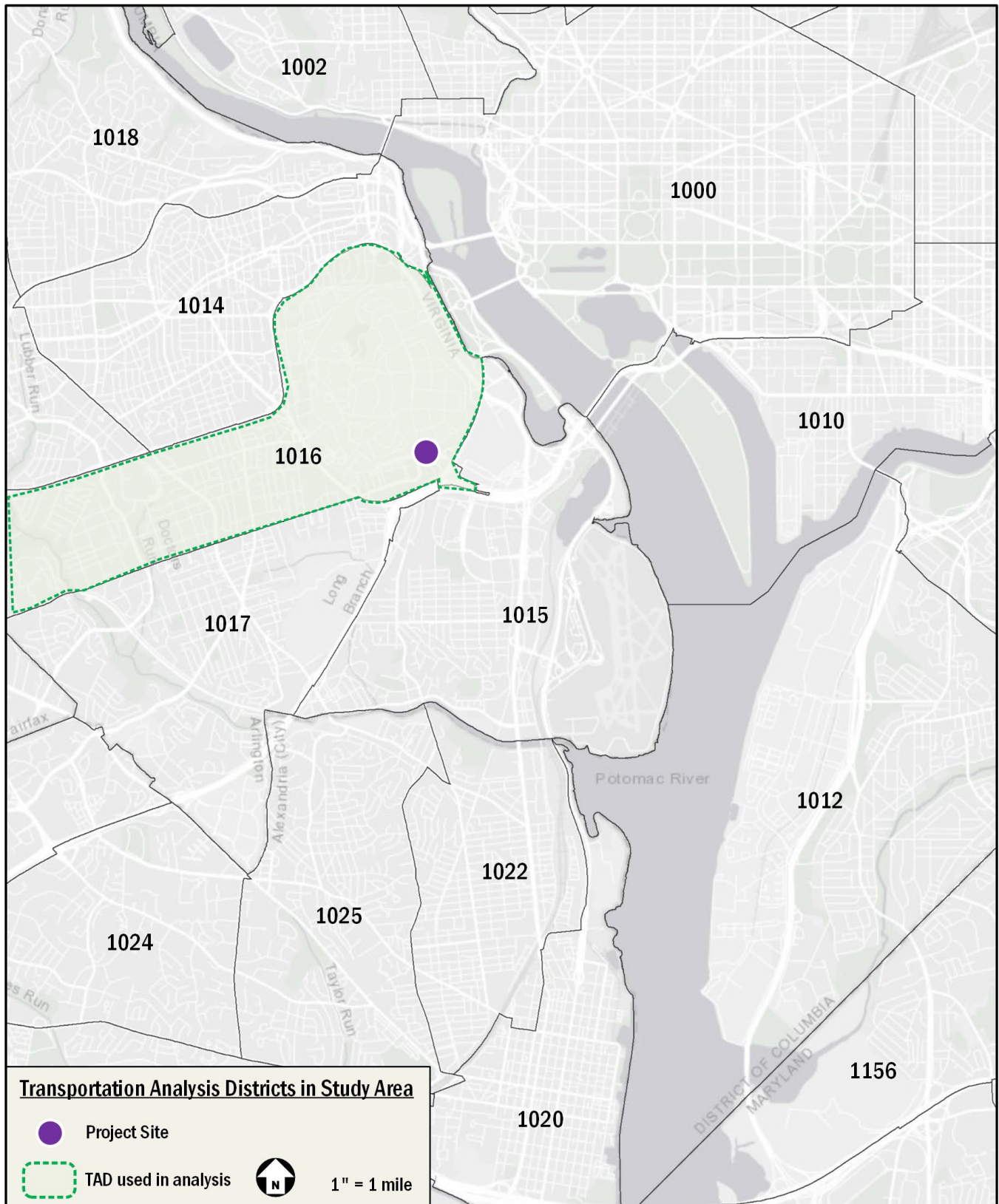


Figure 28: Transportation Analysis District (TAD) in Study Area

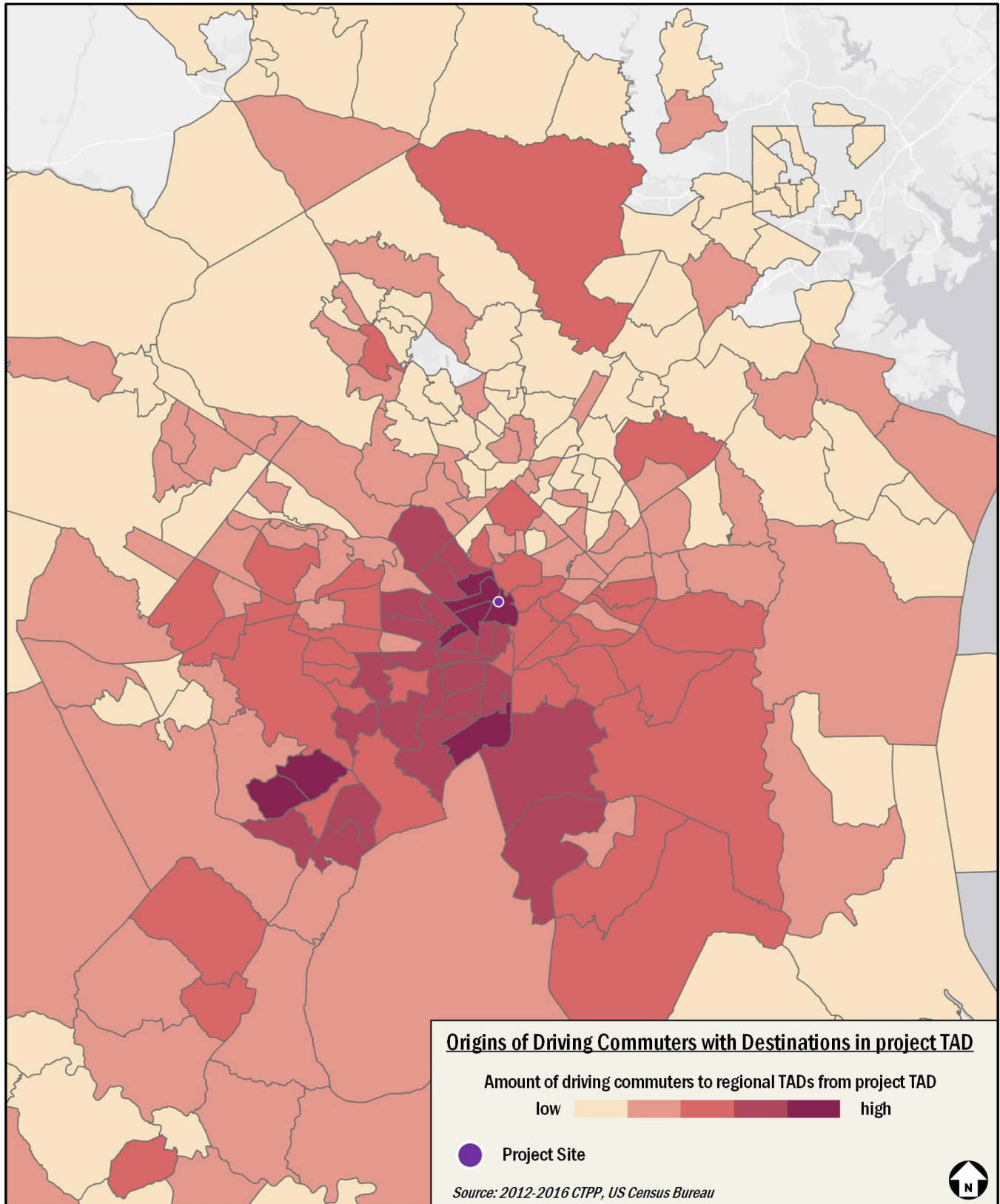


Figure 29: Origins of Driving Commuters with Destinations in project TAD

Traffic Operations

This chapter provides a summary of an analysis of the existing and future roadway capacity in the study area for the 2027 analysis year. Included is an analysis of potential vehicular impacts of the Pentagon Memorial Visitor Education Center development and a discussion of potential improvements.

The purpose of the capacity analysis is to:

- Determine the existing capacity of the study area roadways;
- Determine the overall impact of the proposed development on the study area roadways; and
- Discuss potential improvements and mitigation measures to accommodate the additional vehicular trips.

The capacity analysis focuses on the morning and afternoon commuter peak hours, as determined by the existing traffic volumes in the study area.

The proposed development is considered to have an impact at an intersection within the vehicular study area if any of the following conditions are met:

- The overall intersection or any movement operates at LOS F in the future conditions with the proposed development where it operates at LOS E or better in the background conditions without the proposed development;
- The overall intersection or any movement operates at LOS F during the background condition and the delay increases by more than 10% in the future conditions with the proposed development; or
- If any 95th percentile queue length in the future condition exceeds the available capacity where it does not in the background conditions or increases the 95th percentile queue length by more than 150 feet where it already exceeds the available capacity in the background conditions.

The following conclusions are reached within this chapter:

- There are no impacts to study intersections as a result of the proposed development.
- Therefore, mitigation measures were not analyzed in association with the proposed site.

- Overall, this report concludes that the project will not have a detrimental impact to the surrounding transportation network.

Study Area, Scope, & Methodology

This section outlines the assumptions used to develop the existing and future roadway capacity analyses, including volumes, roadway geometries, and traffic operations. The scope of the analysis contained within this report was discussed with and approved by Arlington County staff. The general methodology of the analysis follows national and Arlington County guidelines on the preparation of transportation impact evaluations of site development.

Capacity Analysis Scenarios

The vehicular capacity analyses are performed to determine if the proposed development will lead to adverse impacts on traffic operations. This is accomplished by comparing future scenarios: (1) without the proposed development (referred to as the Background conditions) and (2) with the development approved and constructed (referred to as the Future conditions).

Specifically, the roadway capacity analysis examined the following scenarios:

1. 2022 Existing Conditions
2. 2027 Future Conditions without the development (2027 Background)
3. 2027 Future Conditions with the development and Right-In/Right-Out (RIRO) Only Access on S Joyce Street (2027 Future – RIRO)
4. 2027 Future Conditions with the development and Left-In/Right-Out Only Access on S Joyce Street (2027 Future – LIRO)

At the time this study was prepared, construction on the DAR project was underway and closed several roads in the study area. As a result, the existing analysis year was set as 2022 to model conditions prior to the commencement of the DAR construction.

Study Area

The study area of the analysis is a set of intersections where detailed capacity analyses are performed for the scenarios listed above. The set of intersections included are those intersections most likely to have potential impacts or require changes to traffic operations to accommodate the proposed development.

Based on the projected future trip generation and the location of the site access points, as agreed to in this report's scoping agreement, the following intersections were chosen for analysis:

1. Columbia Pike and Washington Boulevard Off Ramp/S Orme Street
2. Columbia Pike and S Nash Street (Planned)
3. Columbia Pike and Air Force Memorial Drive
4. Columbia Pike and S Joyce Street
5. Columbia Pike and Site Driveway (Planned)
6. Columbia Pike and Washington Boulevard SB Ramps
7. Columbia Pike and Site Driveway (Planned)
8. Army Navy Drive and S Joyce Street
9. Army Navy Drive and S Hayes Street

Figure 7 shows the vehicular study area intersections. Roadway characteristics, including classification, number of lanes, speed limit, the presence of on-street parking and average annual daily traffic volumes (AADT) are outlined in Table 11.

Table 11: Existing Roadway Network

Roadway	Classification*	Lanes	Speed	On-Street Parking	AADT**
Columbia Pike	Principal Arterial (VDOT)	2	20 mph	No	33,800
S Joyce Street	Minor Arterial (VDOT) Arterial Type B (Arlington)	1-2	25 mph	No	13,000
Washington Boulevard	Principal Arterial (VDOT)	3-4	45 mph	No	40,000
Army Navy Drive	Major Collector (VDOT) Arterial Type B (Arlington)	4-5	35 mph	Yes	7,800

* From VDOT and Arlington GIS

** VDOT AADT Data from 2019

Traffic Volume Assumptions

The following section reviews the traffic volume assumptions and methodologies used in the roadway capacity analyses.

Existing (2022) Traffic Volumes

At the time this study was prepared, construction on the DAR project was underway and closed several roads in the study area. As a result, historical turning movement counts were utilized to establish baseline conditions. More specifically, the Existing (2022) volumes at study intersections were obtained from the Columbia Pike/Washington Boulevard Intersection Modification Report (IMR), prepared by Kimley-Horn in December 2019. The volumes in that study were collected May 2018, February 2019, and June 2019.

Recent (2022 and 2023) data from two intersections unaffected by the DAR construction were compared to the historical count data from the Columbia Pike/Washington Boulevard IMR. The intersections used for comparison were Columbia Pike & Washington Boulevard Off-Ramp/S Orme Street and Army Navy Drive & S Hayes Street. The comparison found that 2019 traffic volumes were higher than recent (2022 and 2023) volumes. As such, for purposes of a conservative analysis and to accurately model conditions prior to the commencement of the DAR construction, 2019 volumes were used as the basis for the Existing analysis.

Based on the average peak hours from all of the count data, the system peak hours assumed were 8:15 AM to 9:15 AM for the morning peak hour and 4:30 PM to 5:30 PM for the afternoon peak hour. The historical and recent turning movement counts are included in the Technical Appendix.

The existing peak hour traffic volumes for intersections within the vehicular study area are shown in Figure 30.

2027 Traffic Volumes

2027 Background Traffic Volumes (without the proposed development)

Traffic projections for the 2027 Background Conditions consist of the existing volumes with three additions:

- Traffic generated by developments expected to be completed prior to 2027 (representing local traffic growth, known as background developments).
1. The eastern end of Columbia Pike will be realigned; modifying its intersection with S Joyce Street and reconfiguring the Columbia Pike/S Joyce Street intersection to a three-legged intersection. It was assumed that the approach volumes for Columbia Pike and S Joyce Street would be the same as the existing Columbia Pike/S Joyce Street/Southgate Road intersection.
 2. A new segment of S Nash Street will be constructed between the Southgate Road/Hobson Drive intersection and Columbia Pike, creating a new signalized intersection at S Nash Street and Columbia Pike. The eastern end of Southgate Road will be demolished, with its new terminus being located at the new S Nash Street. Trips previously turning onto and off Southgate Road were rerouted to use Columbia Pike and the new segment of S Nash Street.
 3. The Air Force Memorial driveway will be closed to vehicle traffic. It is expected that future visitors to the memorial will utilize the new ANC Operations Complex garage south of Columbia Pike and west of S Joyce Street. Trips to the existing memorial driveway were rerouted to the future ANC Operations Complex garage entrance on S Joyce Street. Trips from this driveway were rerouted to the garage exit on Columbia Pike.
 4. The interchange of Washington Boulevard (VA Route 27) and Columbia Pike will be modified, including demolition of the Washington Boulevard southbound cloverleaf interchange ramps and replacing these ramps with one (1) directional off-ramp from Washington Boulevard to Columbia Pike and one (1) directional on-ramp from Washington Boulevard to Columbia Pike, which both meet at a signalized intersection with Columbia Pike. All trips which previously utilized the southbound Washington Boulevard off-ramps to eastbound or westbound Columbia Pike were assumed to access Columbia Pike through the new signalized intersection. Similarly, all trips which previously utilized the southbound Washington Boulevard on-ramps from eastbound or westbound

Rerouted Volumes

The DAR project will alter the geometry of the existing roadway network. For 2027 Background Conditions, volumes were rerouted in the following manner for the proposed geometric changes to the network:

Columbia Pike were assumed to utilize the new signalized intersection to access Washington Boulevard.

5. As part of the ANC expansion, the existing ANC Operations Complex northeast of the Columbia Pike/S Joyce Street/Southgate Road intersection will be relocated to the southwest of the intersection. Trips to this driveway were rerouted to the future ANC Operations Complex garage entrance on S Joyce Street. Trips departing this driveway were rerouted to the future garage exit on Columbia Pike.

Regional Traffic Growth

While the background developments represent local traffic changes, regional traffic is typically accounted for using growth rates. The growth rates used in this analysis were derived using VDOT's Annual Average Daily Traffic (AADT) data, transportation studies for recently-approved projects, and discussions with Arlington County staff during the scoping process. According to historical data, the average historical growth rate on Columbia Pike, S Joyce Street, and Army Navy Drive near the project site has been 0.8% in recent years, and the approved transportation study for the 3401 Columbia Pike project assumed a 0.5% inherent growth rate. As such, an annual growth rate of 0.5% was applied to volumes on Columbia Pike, S Joyce Street, and Army Navy Drive.

Background Developments

Following industry methodologies, a background development must meet the following criteria to be incorporated into the analysis:

- Be located in the study area, defined as having an origin or destination point within the cluster of study area intersections;
- Have entitlements; and
- Have a construction completion date prior or close to the proposed development.

Based on these criteria, four (4) developments were included in the 2027 Background Conditions scenario. These developments are:

1. Metropolitan Park 6, 7, 8
2. PenPlace
3. 400 11th Street S – Verizon Site
4. Pentagon Centre

The location of the background developments included in the 2027 Background Conditions scenario in relation to the proposed Pentagon Memorial Visitor Education Center development is shown on Figure 31. Transportation studies were available for all the background developments included in the 2027 Background Conditions. Details on each of the background developments included in the 2027 Background Conditions are presented below:

1. **Metropolitan Park 6, 7, 8:** Located in the Pentagon City area and bounded by 13th Street S to north, 15th Street S to the south, S Elm Street to the west, and S Eads Street to the east, the approved Metropolitan Park 6, 7, 8 development will raze the existing warehouse space and redevelop to include two buildings with approximately 2.1 million square feet of office space and 55,000 square feet of neighborhood-serving ground floor retail. The expected build out year is 2023. The development is expected to generate 558 net weekday AM peak hour vehicle trips and 524 net weekday PM peak hour vehicle trips based on the Traffic Impact Study prepared by Gorove Slade Associates dated October 22, 2019.
2. **PenPlace:** Located in the Pentagon City area and bounded by Army Navy Drive to the north, 12th Street S to the south, S Eads Street to the east, and S Fern Street to the west, the approved PenPlace development will include four (4) buildings with approximately 2.8 million square feet of office space, 391,800 square feet of amenity space, 14,600 square feet of daycare, 94,400 square feet of neighborhood-serving ground floor retail space, and 26,500 square feet of community space. The expected build out year is 2025. The development is expected to generate 867 weekday AM peak hour vehicle trips and 821 weekday PM peak hour vehicle trips based on the Traffic Impact Study prepared by Gorove Slade Associates dated February 11, 2022.
3. **Verizon Site:** Located in the Crystal City area and bounded by S Eads Street to the west, 11th Street S to the north, existing office and residential buildings to the east, and 12th Street S to the south, the approved Verizon Site development will raze the existing telecommunications facility and redevelop to include one mixed-use building with approximately 306 dwelling

units and 10,908 square feet of neighborhood-serving ground floor retail. The expected build out year is 2022. The development is expected to generate 42 net weekday AM peak hour vehicle trips and 40 net weekday PM peak hour vehicle trips based on the Traffic Impact Study prepared by Gorove Slade Associates dated July 19, 2019.

4. **Pentagon Centre:** Located in the Pentagon City area and bounded by 12th Street S to the north, 15th Street S to the south, S Fern Street to the east, and S Hayes Street to the west, the approved Pentagon Centre development will redevelop the existing 337,900 square feet of retail space into multiple uses including 357,800 square feet of retail space and 714 dwelling units. The expected build out year is 2023. The development is expected to generate 173 net weekday AM peak hour vehicle trips and 217 net weekday PM peak hour

vehicle trips based on the Trip Generation Comparison prepared by Wells + Associates dated June 12, 2014 (Revised April 2, 2015).

Trips generated by the approved background developments are included in the Technical Appendix. The traffic volumes generated by background developments were added to the existing traffic volumes in order to establish the 2027 Background traffic volumes. Trip distribution assumptions for the background developments were based on the distributions included in their respective studies or based on those determined for the proposed development and altered where necessary based on anticipated travel patterns. The traffic volumes for the 2027 Background conditions are shown on Figure 32.

Table 12: Traffic Generated by 2027 Background Developments

Development	Trip Generation					
	AM Peak Hour			PM Peak Hour		
	<i>In</i>	<i>Out</i>	<i>Total</i>	<i>In</i>	<i>Out</i>	<i>Total</i>
<u>Metropolitan Park 6, 7, 8 ⁽¹⁾</u>						
Total New Vehicle Trips	485	73	558	86	437	523
<u>PenPlace ⁽²⁾</u>						
Total New Vehicle Trips	719	145	864	168	646	814
<u>Verizon Site ⁽³⁾</u>						
Total New Vehicle Trips	12	30	42	23	17	40
<u>Pentagon Centre ⁽⁴⁾</u>						
Total New Vehicle Trips	39	134	173	137	80	217
Total Background Trips	1,255	382	1,637	414	1,180	1,594

(1): Extracted from Metropolitan Park 6, 7, 8 MMTA (10.22.2019) prepared by Gorove Slade Associates.

(2): Extracted from PenPlace MMTA (02.11.2022) prepared by Gorove Slade Associates.

(3): Extracted from Verizon Site MMTA (07.19.2019) prepared by Gorove Slade Associates.

(4): Extracted from Pentagon Centre PDSP Trip Generation Comparison (04.02.2015) prepared by Wells + Associates.

2027 Future Traffic Volumes

The 2027 Future Conditions traffic volumes consist of the 2027 Background volumes with the addition of the traffic volumes generated by the proposed development (site-generated trips). Thus, the 2027 Future Conditions traffic volumes include traffic generated by: the existing volumes, background developments, inherent growth, and the proposed development.

Trip distribution and assignments for site-generated traffic were primarily determined using existing volumes, anticipated traffic patterns, and other recent studies conducted in the area. The origins of inbound and destinations of outbound vehicular trips were examined with two (2) conditions: One with a right-in/right-out driveway and the other with a left-in/right-in/right-out driveway at intersection #7. A summary of the inbound and outbound trip distribution assumptions is shown on Figure 33 and Figure 34 for the proposed development. Trip distribution and assignment assumptions were vetted and approved by Arlington County.

Based on the trip distribution and assignment assumptions, site-generated trips were distributed through the study area intersections. The site-generated traffic volumes for the 2027 build-out year are shown on Figure 35 and Figure 36. The 2027 Future Conditions traffic volumes, which are comprised of existing volumes, background developments, and the proposed development are shown on Figure 37 and Figure 38.

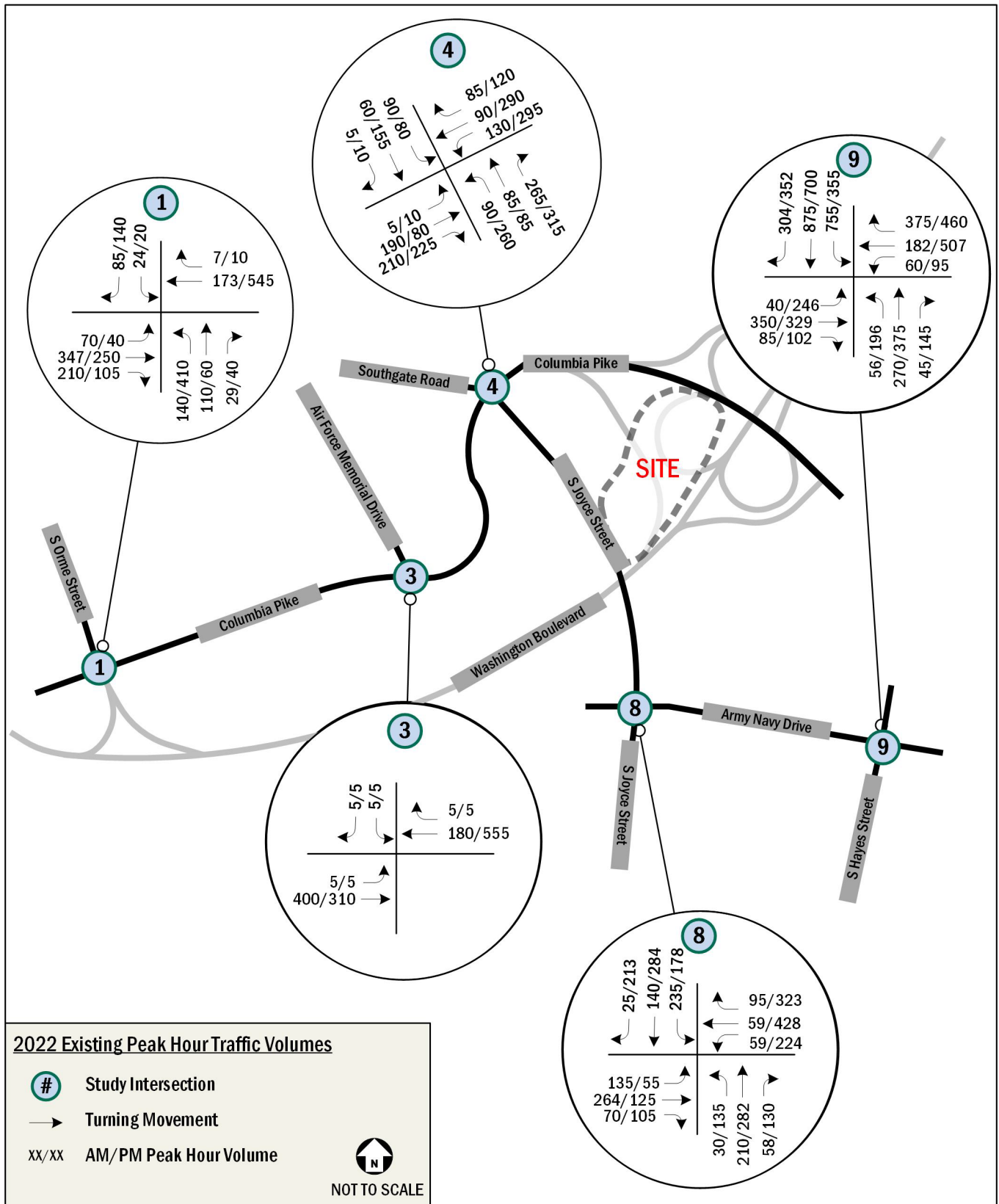


Figure 30: 2022 Existing Peak Hour Traffic Volumes

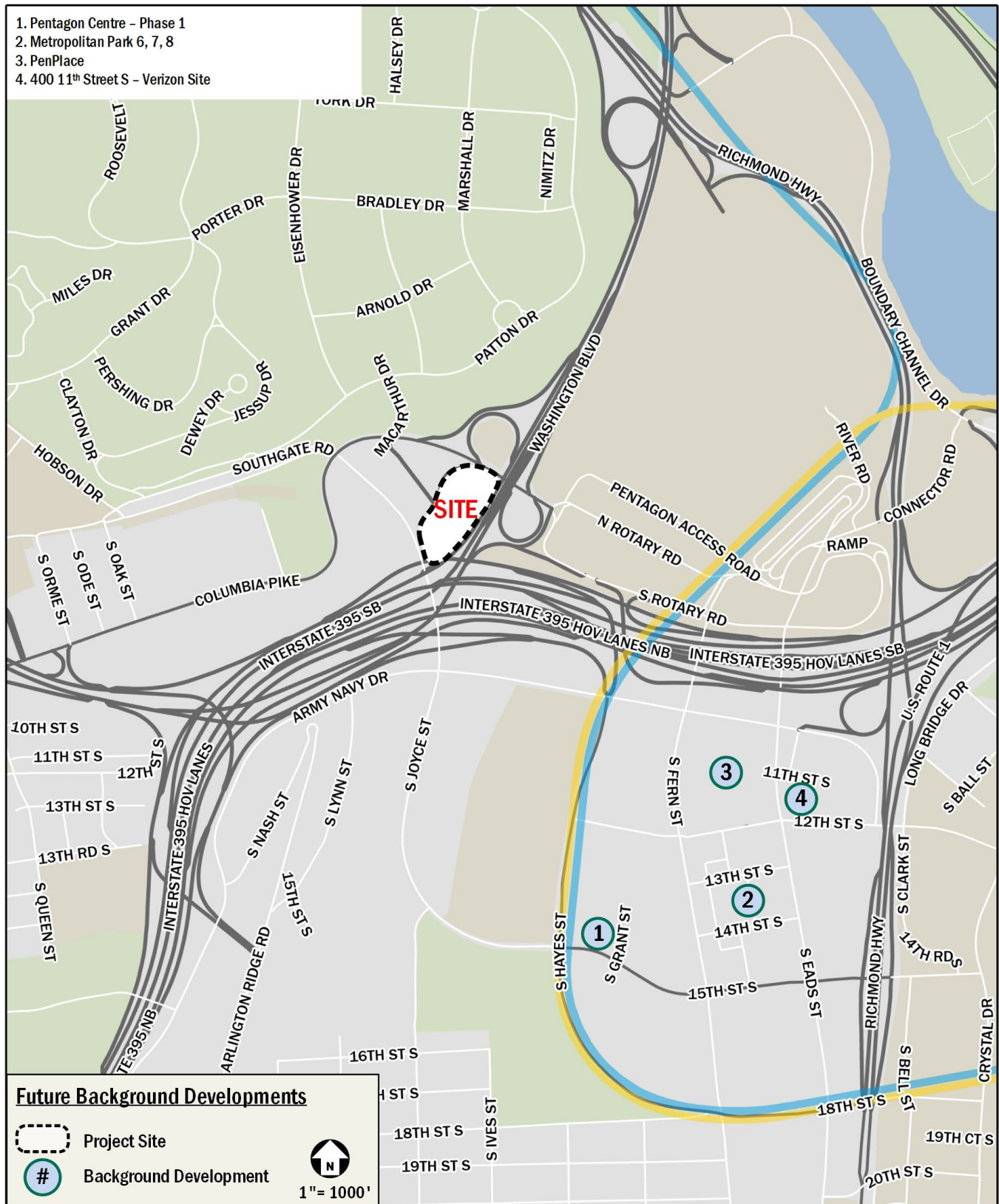


Figure 31: Future Background Developments

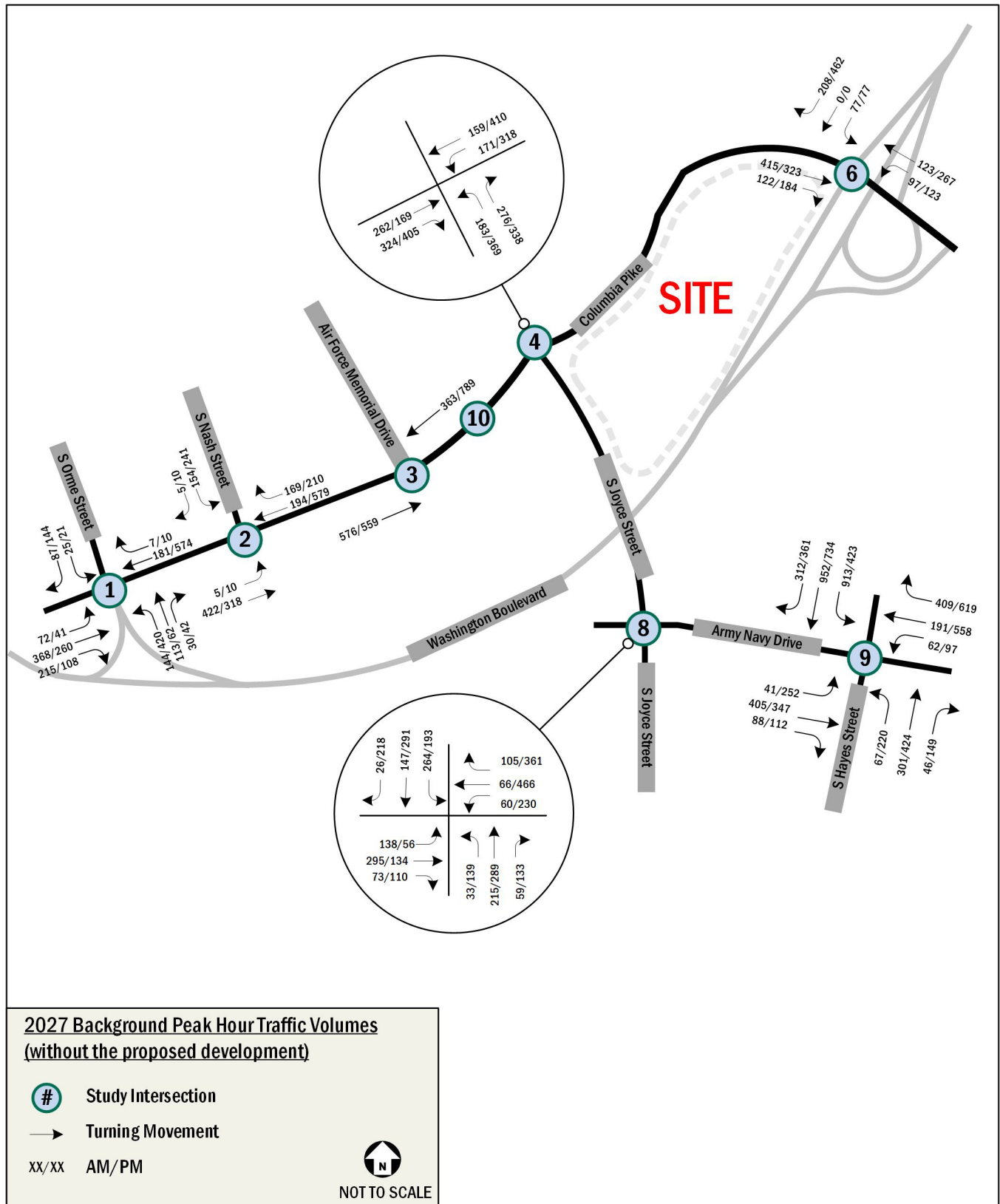


Figure 32: 2027 Background Peak Hour Traffic Volumes (without the proposed development)

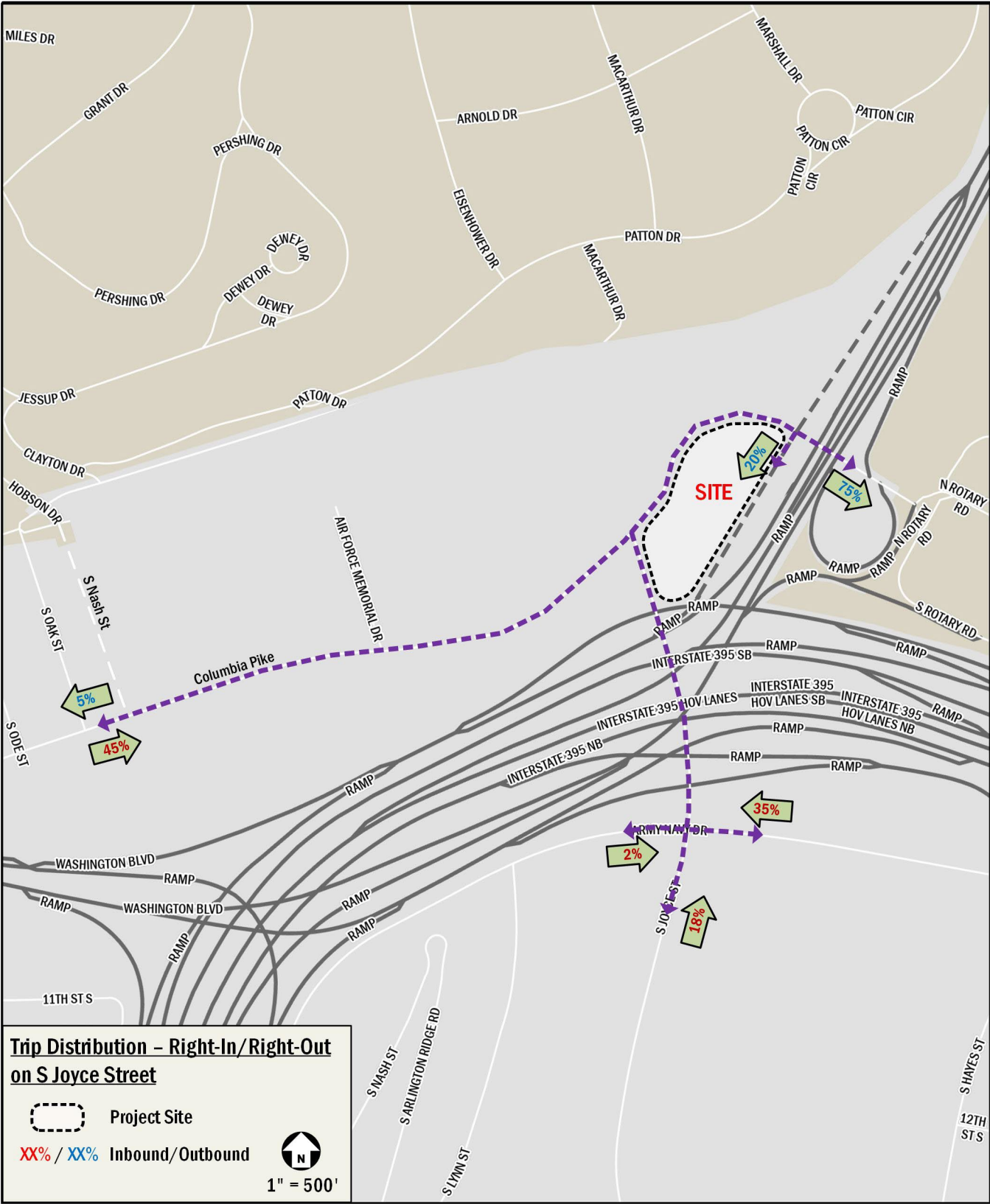


Figure 33: Trip Distribution – Right-In/Right-Out on S Joyce Street



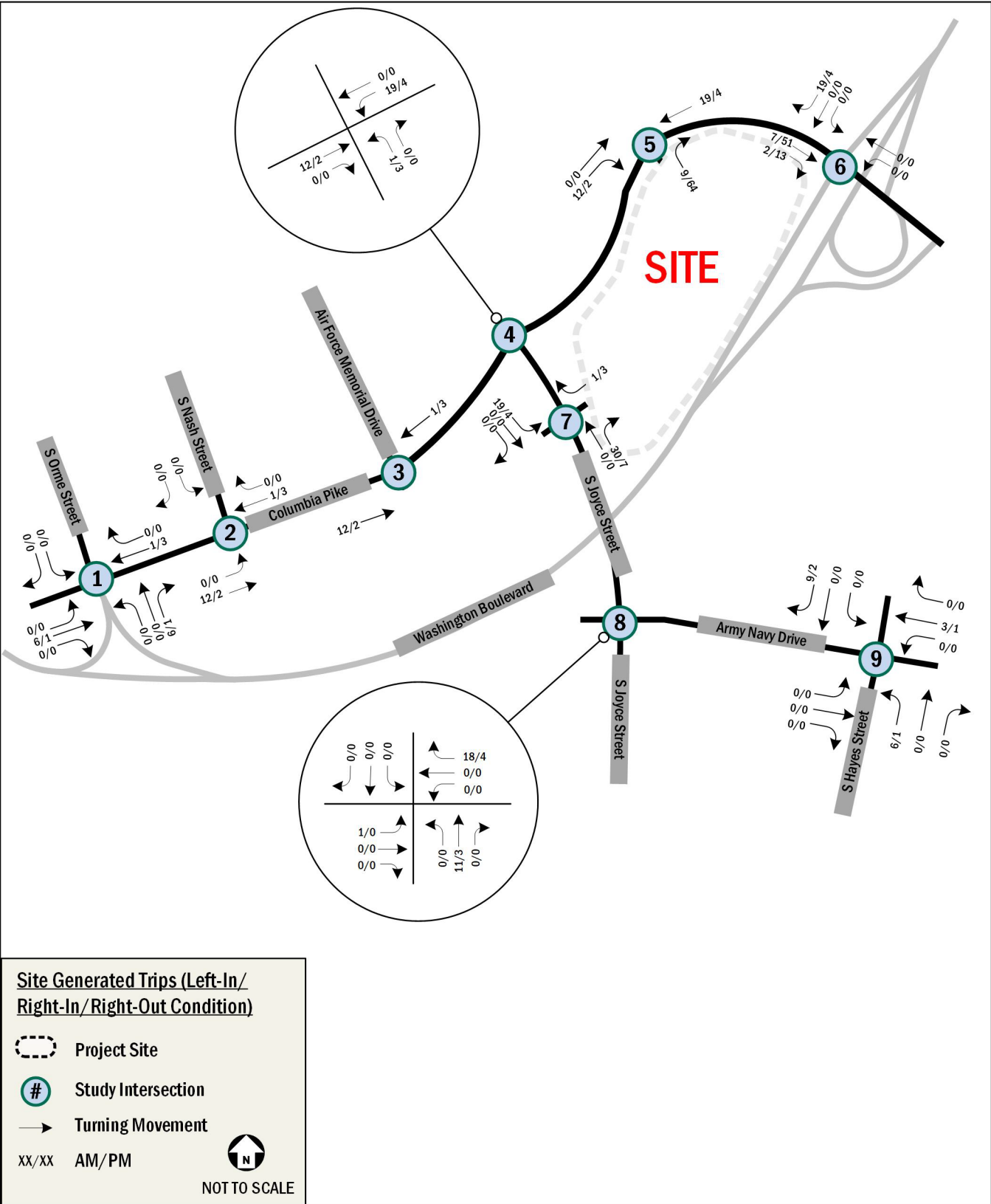


Figure 35: Site Generated Trips (Left-In/Right-In/Right-Out Condition)

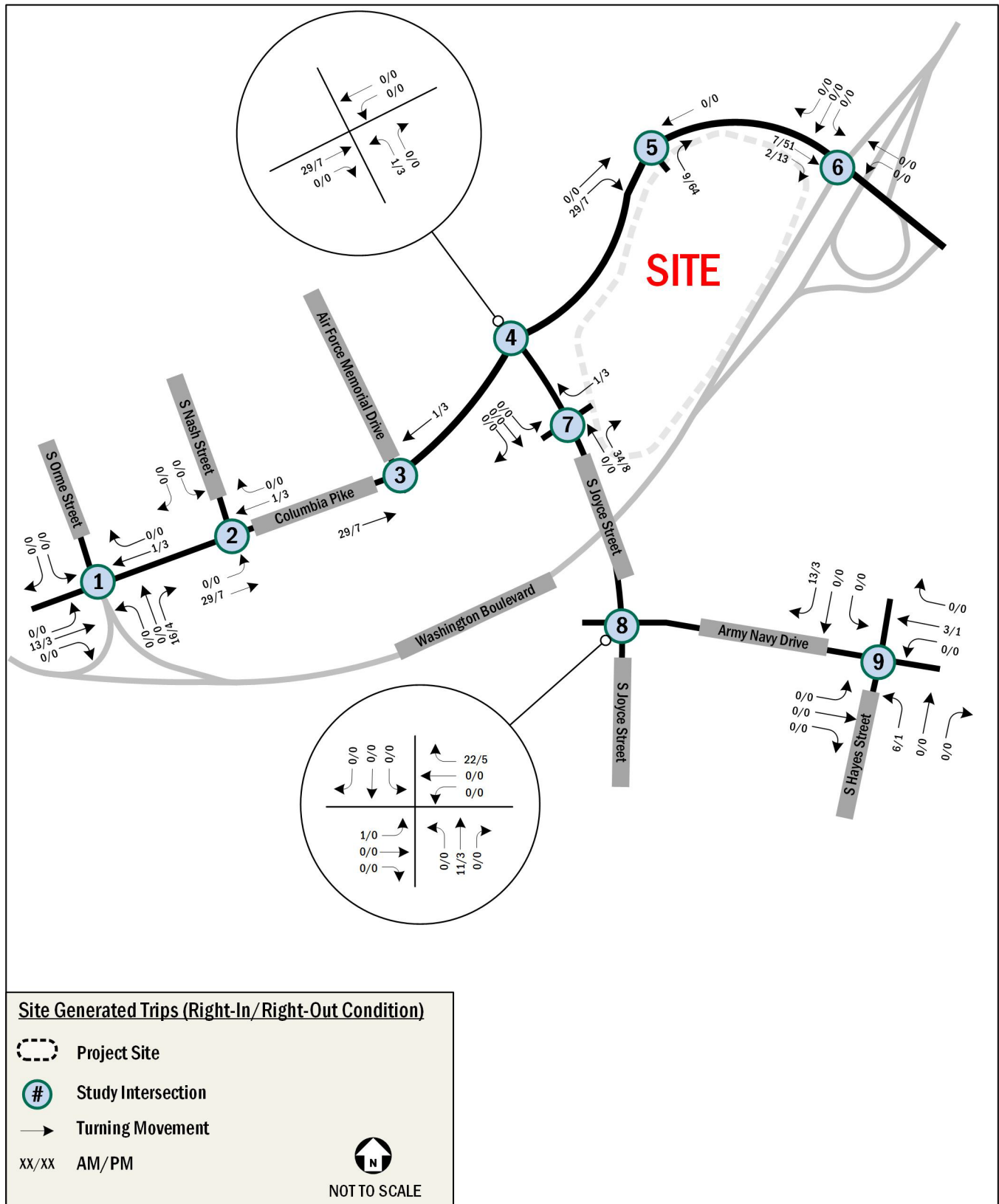


Figure 36: Site Generated Trips (Right-In/Right-Out Condition)

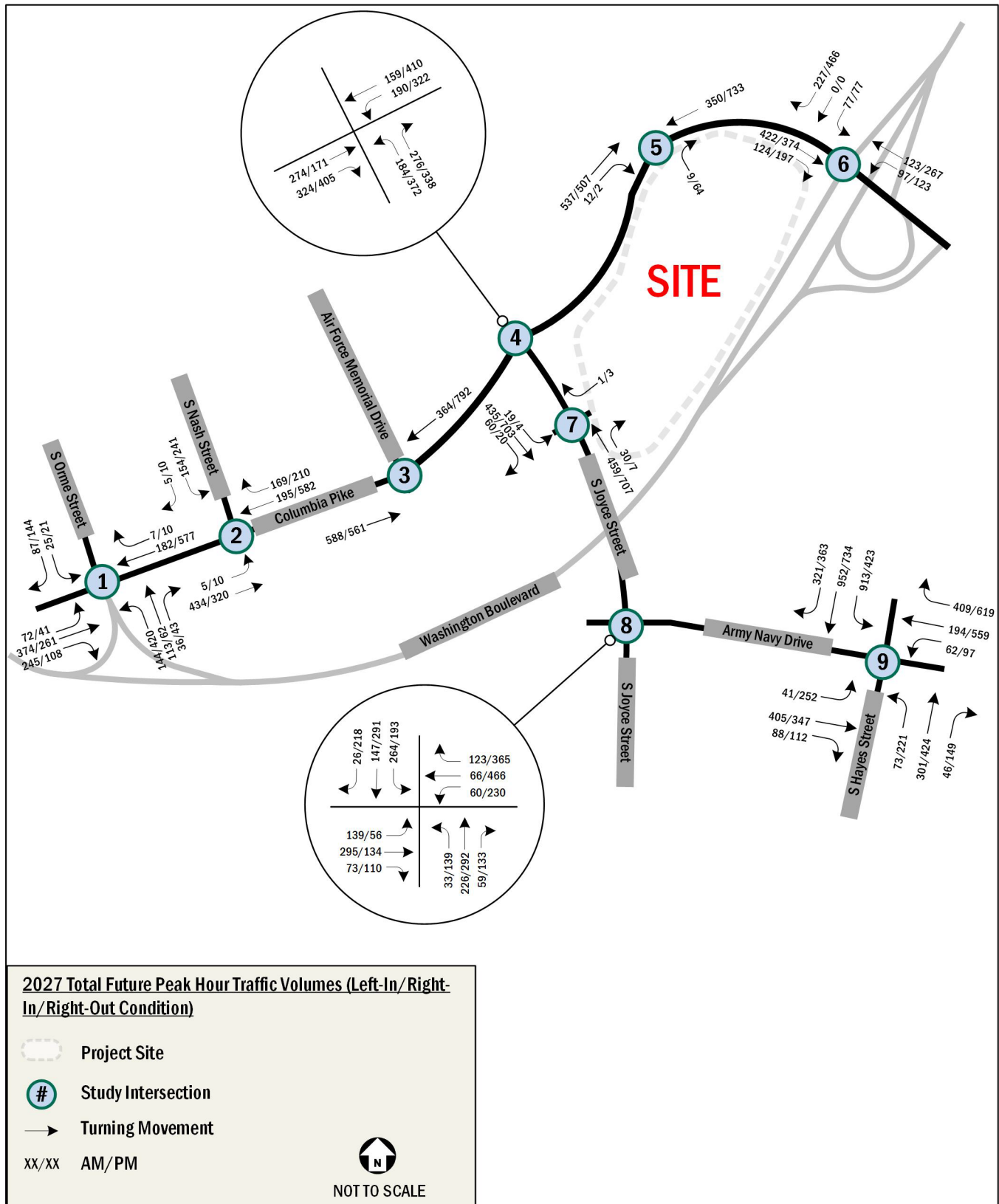


Figure 37: 2027 Total Future Peak Hour Traffic Volumes (Left-In/Right-In/Right-Out Condition)

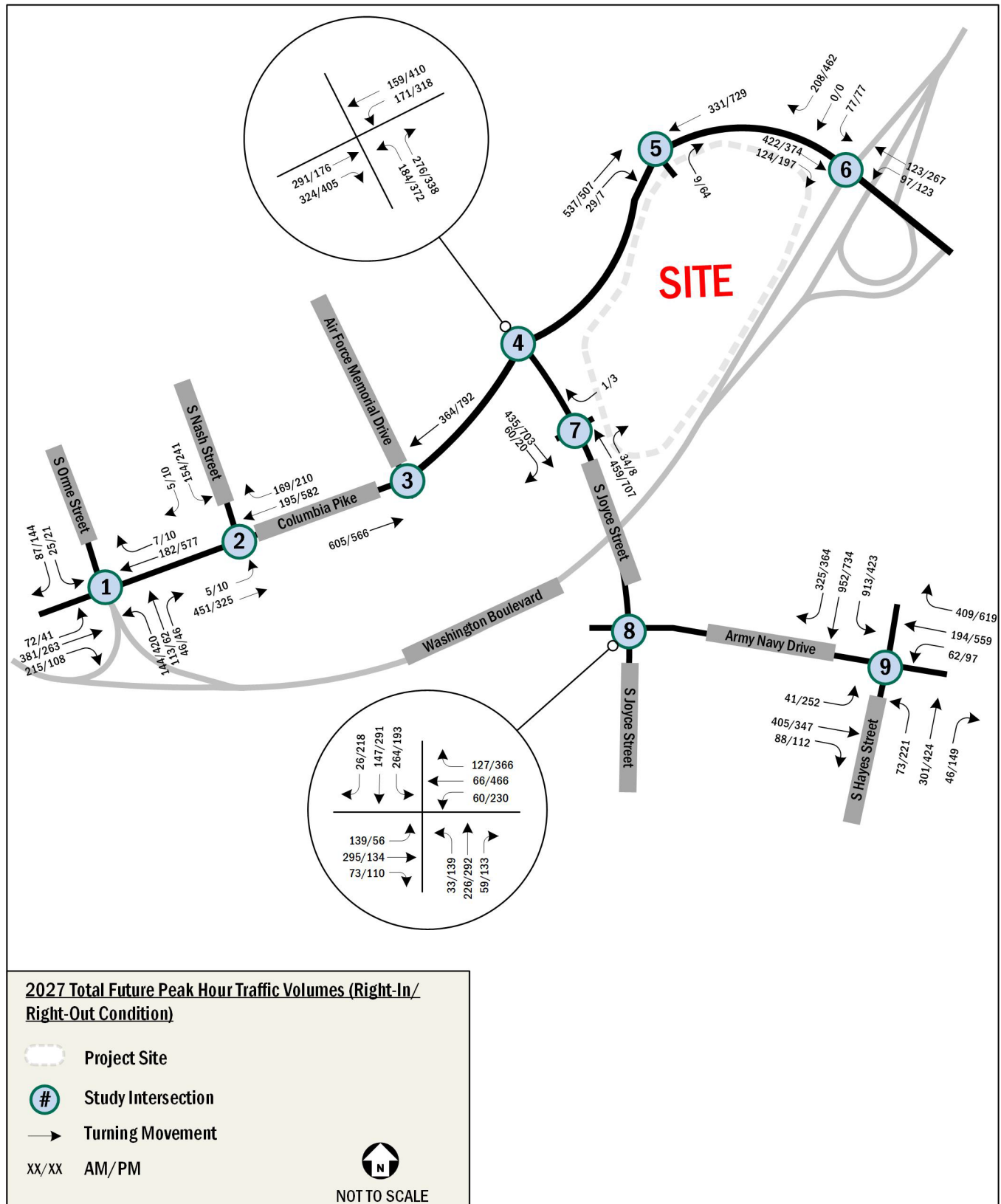


Figure 38: 2027 Total Future Peak Hour Traffic Volumes (Right-In/Right-Out Condition)

Geometry and Operations Assumptions

The following section reviews the roadway geometry and operations assumptions made and the methodologies used in the roadway capacity analyses.

2022 Existing Geometry and Operations Assumptions

At the time this study was prepared, construction on the DAR project was underway and closed several roads in the study area. As a result, the existing analysis year was set as 2022 to model conditions prior to the commencement of the DAR construction, and pre-construction lane geometry and operations were assumed in the analysis. Signal timings and offsets for pre-construction Existing Conditions were obtained from Arlington County. The existing local roadway network including lane configurations and intersection control is detailed in and illustrated in Figure 39.

2027 Background Geometry and Operations Assumptions (without the proposed development)

Following industry standard methodologies, a background improvement must meet the following criteria to be incorporated into the analysis:

- Be funded; and
- Have a construction completion date prior or close to the proposed development.

Based on these criteria, a number of geometry and operations improvements were included in the 2027 Background scenario. Roadway improvements that are part of the DAR project were incorporated into the 2027 Background Conditions scenario.

Defense Access Roads (DAR) Project

The DAR project will alter the geometry of the existing roadway network in the following ways:

1. The eastern end of Columbia Pike will be realigned; modifying its intersection with S Joyce Street and reconfiguring the Columbia Pike/S Joyce Street intersection to a three-legged intersection. The lane geometry at this intersection will include:
 - The eastbound approach will have two thru lanes and one channelized right-turn lane.
 - The northbound approach will have one left-turn lane and one right-turn lane.

- The westbound approach will have one left-turn lane and two thru lanes.
2. A new segment of S Nash Street will be constructed between the Southgate Road/Hobson Drive intersection and Columbia Pike, creating a new signalized intersection at S Nash Street and Columbia Pike. The lane geometry at this intersection will include:
 - The southbound approach (Washington Boulevard off-ramp) will have one left/right lane.
 - The westbound approach will have one thru lane and one thru/right lane.
 - The eastbound approach will have one left/thru lane and one thru lane.
 3. The eastern end of Southgate Road will be demolished, with its new terminus being located at the new S Nash Street.
 4. The Air Force Memorial driveway on Columbia Pike will be closed to vehicle traffic.
 5. The interchange of Washington Boulevard (VA Route 27) and Columbia Pike will be modified, including demolition of the Washington Boulevard southbound cloverleaf interchange ramps and replacing these ramps with one (1) directional off-ramp from Washington Boulevard to Columbia Pike and one (1) directional on-ramp from Washington Boulevard to Columbia Pike, which both meet at a signalized intersection with Columbia Pike. The lane geometry at this intersection will include:
 - The southbound approach (Washington Boulevard off-ramp) will have one left-turn lane, one thru/right lane, and one right-turn lane.
 - The eastbound approach (Columbia Pike) will have one thru lane and one thru/right lane.
 - The westbound approach (Columbia Pike) will have one left/thru lane and one thru lane.

Lane geometry for the affected intersections was determined based on 99% design plans for the DAR project provided by Kimley-Horn.

No proposed signal timings were provided by the County; as such, signal timing assumptions were developed for future signalized intersections. The assumed signal timings at these intersections were based on existing signal timings and adjusted as necessary.

Army Navy Drive Complete Streets

The Army Navy Drive Complete Streets project will alter the geometry of the existing roadway network in the following ways:

1. The right-of-way along Army Navy Drive and at intersections will be reallocated to accommodate non-auto modes. The lane geometry at the Army Navy Drive/S Joyce Street intersection will include:
 - The eastbound approach will have one left-turn lane, one thru lane, and one thru/right lane.
 - The westbound approach will have one left-turn lane, one thru lane, and one right-turn lane.
 - The northbound approach will have one left-turn lane, one thru lane, and one thru/right lane.
 - The southbound approach will have one left-turn lane, one thru lane, and one thru/right lane.
2. Due to the same reallocation, the lane geometry at the Army Navy Drive/S Hayes Street intersection will include:
 - The eastbound approach will have one left-turn lane, two thru lanes, and one right-turn lane.
 - The westbound approach will have one left-turn lane, two thru lanes, and one right-turn lane.
 - The northbound approach will have one left-turn lane, three thru lanes, and one right-turn lane.
 - The southbound approach will have one left-turn lane, two thru lanes, and one thru/right lane.

Lane geometry for the affected intersections was determined based on design plans for the Army Navy Complete Streets project available from Arlington County.

Signal timing assumptions were developed for future signalized intersections. The assumed signal timings at these intersections were based on existing signal timings and modified to match the proposed configurations.

Lane configurations and traffic controls for the 2027 Background Conditions are shown in Figure 40.

2027 Future Geometry and Operations Assumptions (with the proposed development)

The configurations and traffic controls assumed in the 2027 Future Conditions are based on the 2027 Background Conditions with the addition of the proposed development.

Proposed changes to the geometry of the roadway network include two (2) new curb cuts for driveway access to the site. These driveways are located at the southwestern corner of the site along S Joyce Street and the northeastern corner of the site along Columbia Pike.

There are no proposed changes to signal timing as part of the proposed development in the 2027 Future Conditions. In the current version of the site plan, both of these driveways are designed to be right-in/right-out only. The project team is currently studying the feasibility of an alternative configuration of the S Joyce Street driveway, in which a median break would be provided on S Joyce Street to permit southbound left turns into the site. As such, two scenarios were studied for 2027 Future Conditions (one for each potential driveway configuration). Lane configurations and traffic controls for the 2027 Future Conditions are shown in Figure 41 for the left-in/right-out condition at the S Joyce Street driveway, and in Figure 42 for the right-in/right-out condition.



Figure 39: 2022 Existing Lane Configurations and Traffic Controls

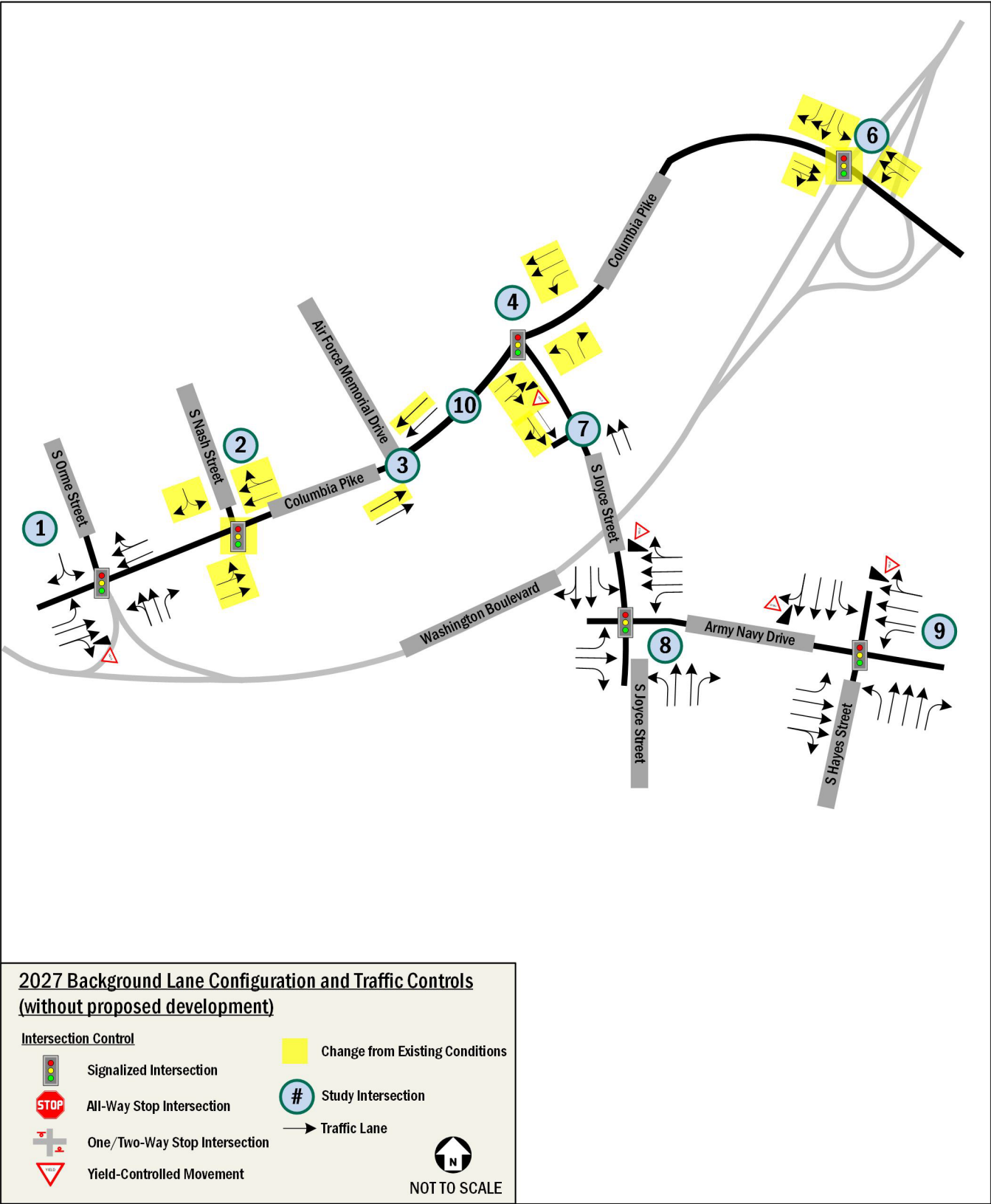


Figure 40: 2027 Background Lane Configuration and Traffic Controls (without the proposed development)

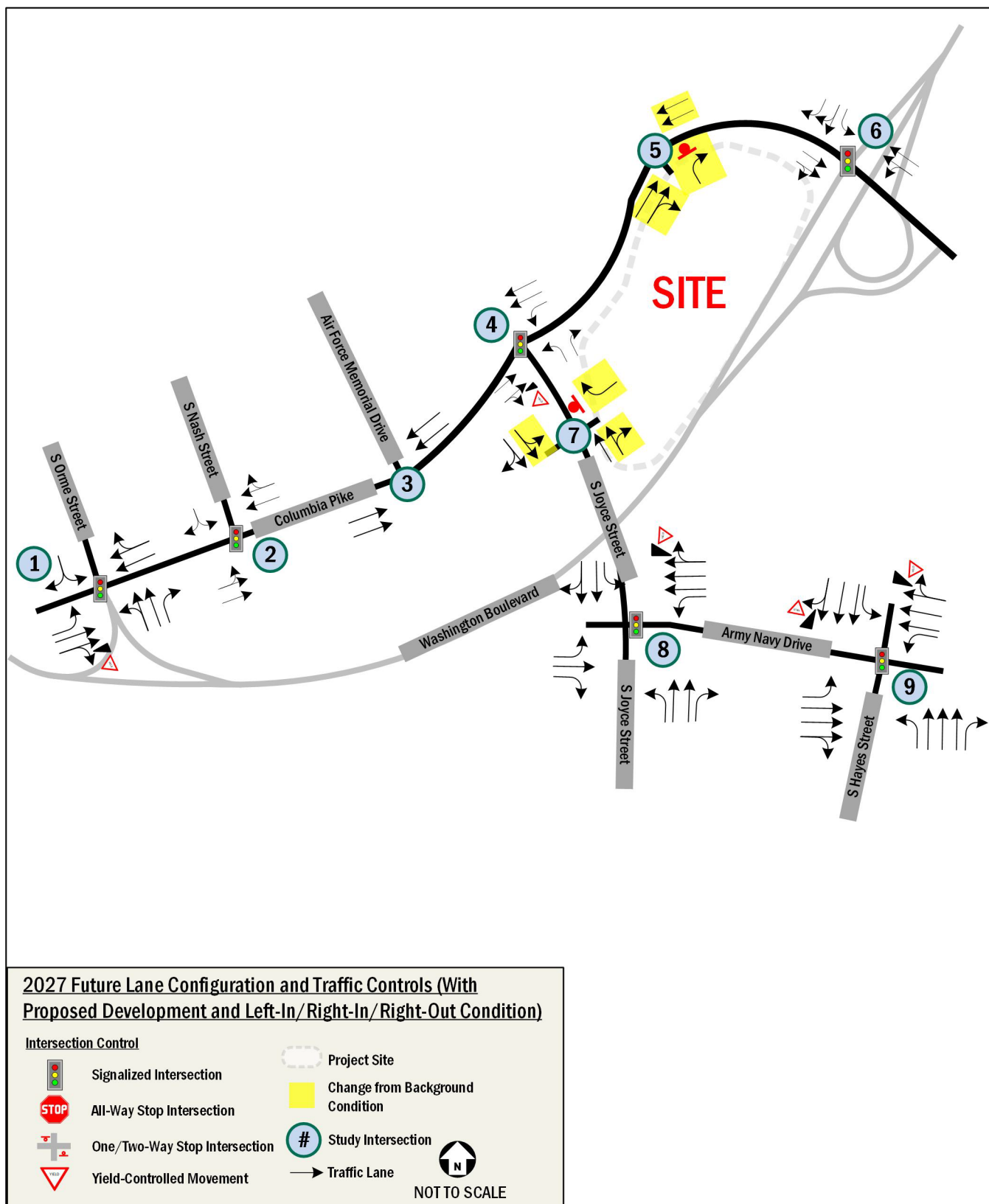


Figure 41: 2027 Future Lane Configuration and Traffic Controls (With the Proposed Development and Left-In/Right-In/Right-Out Condition)

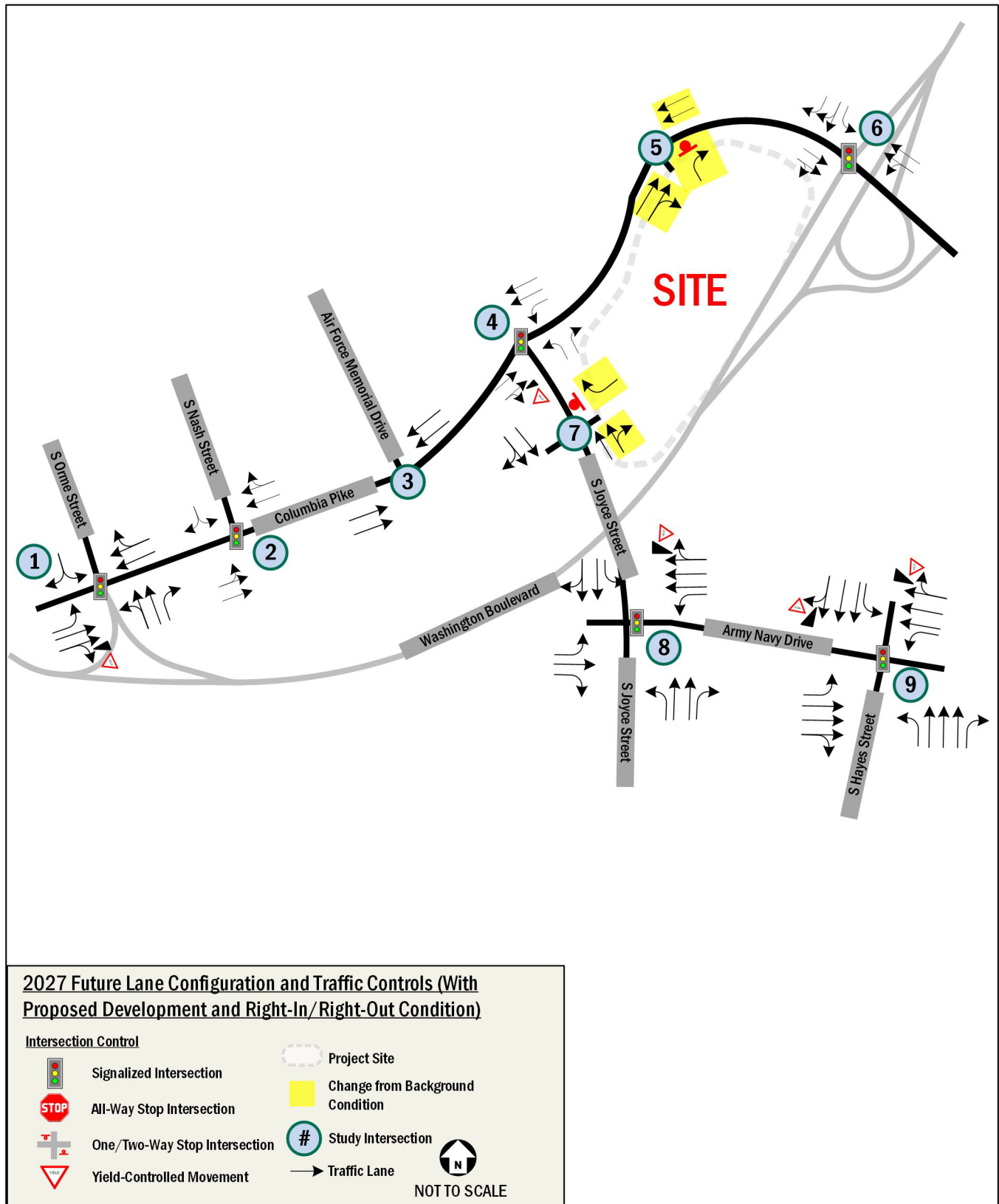


Figure 42: 2027 Future Lane Configuration and Traffic Controls (With the Proposed Development and Right-In/Right-Out Condition)

Vehicular Analysis Results

Intersection Capacity Analysis

Intersection capacity analyses were performed for the scenarios outlined previously at the intersections contained within the study area during the morning and afternoon peak hours. *Synchro*, version 11 was used to analyze the study intersections based on the Highway Capacity Manual 2000 (HCM) methodology and includes level of service, delay, and queue length comparisons for the turning movements analyzed. Both signalized and unsignalized intersections were evaluated using HCM 2000.

Peak Hour Factors

Peak hour factors were applied in accordance with *Traffic Operations and Safety Analysis Manual 2.0* prepared by VDOT dated February 2020. As such, peak hour factors by approach between 0.85 and 1.00 were used for the existing year analysis. Where the calculated peak hour factor based on the existing turning movement counts was greater than 0.85, the calculated factor was applied. Where the calculated factor was 0.85 or less, a factor of 0.85 was applied.

Peak hour factors by approach between 0.92 and 1.00 were used for all future scenarios. Where the calculated peak hour factor based on the existing turning movement counts was greater than 0.92, the calculated factor was applied. Where the calculated factor was 0.92 or less, a factor of 0.92 was applied.

Heavy Vehicle Percentages

A heavy vehicle percentage of 2% was used for existing movements unless determined to be higher from the turning movement counts, in which case the higher percentage was used. A default heavy vehicle percentage of 2% was used for any new movements.

Geometry and Operations

Existing signal timings were obtained from Arlington County for signalized intersections in the vehicular study area. These timings were verified in the field by Gorove Slade and adjusted where necessary.

Level of Service and Delay

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each movement. A LOS grade is a letter grade based on the average delay (in seconds) experienced by motorists traveling through an

intersection. LOS results range from “A” being the best to “F” being the worst. LOS E is typically used as the acceptable LOS threshold in Arlington County; although LOS F is sometimes accepted in urbanized areas if vehicular improvements would be a detriment to safety or non-auto modes of transportation. For the purpose of this analysis, it is desirable to achieve a level of service (LOS) of E or better for each movement at the intersections.

The LOS capacity analyses were based on: (1) the peak hour traffic volumes; (2) the lane use and traffic controls; and (3) the Highway Capacity Manual (HCM) methodologies (using the *Synchro* software). The average delay of each movement and LOS is shown for the signalized intersections in addition to the overall average delay and intersection LOS grade. The HCM does not give guidelines for calculating the average delay for a two-way stop-controlled intersection, as the approaches without stop signs would technically have no delay. Detailed LOS descriptions and the analysis worksheets are contained in the Technical Appendix.

Queuing Analysis

In addition to the capacity analyses, a queuing analysis was performed at the study intersections. The queuing analysis was performed using *Synchro* software. The 50th percentile and 95th percentile queue lengths are shown for each lane group at the study area signalized intersections. The 50th percentile queue is the maximum back of queue on a median cycle. The 95th percentile queue is the maximum back of queue that is exceeded 5% of the time. For unsignalized intersections, only the 95th percentile queue is reported for each lane group (including free-flowing left turns and stop-controlled movements) based on the HCM 2000 calculations. Queuing analysis worksheets are contained in the Technical Appendix.

2022 Analysis Results

The Existing (2022) results of the intersection capacity analyses for the AM and PM peak hours are expressed in level of service (LOS) and delay (seconds per vehicle) per movement and presented in Table 13. The capacity analysis results indicate that most intersections operate at acceptable LOS under the Existing (2022) Conditions; however, two (2) intersections have one or more movements that operate at levels beyond acceptable thresholds in one or more peak hour:

- Columbia Pike & S Joyce Street

- Northbound Left (PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Northbound Left (PM Peak Hour)

The Existing (2022) queuing results for the AM and PM peak hours are expressed by movement and are presented in Table 14. Four (4) intersections have at least one movement with 95th percentile queues that exceed the available storage length in the morning and/or afternoon peak hour:

- Columbia Pike & Washington Boulevard Off-Ramp/S Orme Street
 - Southbound Right (AM and PM Peak Hour)
- Columbia Pike & S Joyce Street
 - Westbound Left (PM Peak Hour)
 - Northbound Left (PM Peak Hour)
- Army Navy Drive & S Joyce Street
 - Northbound Left (PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Eastbound Left (PM Peak Hour)
 - Northbound Left (PM Peak Hour)
 - Northbound Right (PM Peak Hour)

2027 Analysis Results

2027 Background Analysis Results (without the proposed development)

The Background (2027) results of the intersection capacity analyses for the AM and PM peak hours are expressed in level of service (LOS) and delay (seconds per vehicle) per movement and are presented in Table 13. The capacity analysis results indicate that most intersections operate at acceptable LOS under the Background (2027) Conditions; however, two (2) intersections have one or more movements that operate at levels beyond acceptable thresholds in one or more peak hour:

- Army Navy Drive & S Joyce Street
 - Northbound Left (PM Peak Hour)
 - Southbound Left (PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Overall Intersection (PM Peak Hour)
 - Eastbound Left (PM Peak Hour)

- Eastbound Right (PM Peak Hour)
- Westbound Left (AM and PM Peak Hour)
- Westbound Right (PM Peak Hour)
- Northbound Left (AM and PM Peak Hour)
- Southbound Left (AM and PM Peak Hour)

The Background (2027) queuing results for the AM and PM peak hours are expressed by movement and are presented in Table 14. Four (4) intersections have at least one movement with 95th percentile queues that exceed the available storage length in the morning and/or afternoon peak hour:

- Columbia Pike & Washington Boulevard Off-Ramp/S Orme Street
 - Southbound Right (AM and PM Peak Hour)
- Columbia Pike & S Joyce Street
 - Westbound Left (PM Peak Hour)
 - Northbound Left (AM and PM Peak Hour)
- Army Navy Drive & S Joyce Street
 - Northbound Left (PM Peak Hour)
 - Northbound Thru/Right (PM Peak Hour)
 - Southbound Left (AM and PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Eastbound Left (PM Peak Hour)
 - Westbound Left (PM Peak Hour)
 - Westbound Right (PM Peak Hour)
 - Northbound Left (PM Peak Hour)
 - Northbound Right (PM Peak Hour)
 - Southbound Left (AM Peak Hour)

2027 Future Analysis Results (with the proposed development) and Right-In/Right-Out (RIRO) Only Access on S Joyce Street

The Future (2027) RIRO results of the intersection capacity analyses for the AM and PM peak hours are expressed in level of service (LOS) and delay (seconds per vehicle) per movement and are presented in Table 13. The capacity analysis results indicate that most intersections operate at acceptable LOS under the Future (2027) RIRO Conditions; however, two (2) intersections have one or more movements that operate at levels beyond acceptable thresholds in one or more peak hour:

- Army Navy Drive & S Joyce Street
 - Northbound Left (PM Peak Hour)
 - Southbound Left (PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Overall Intersection (PM Peak Hour)
 - Eastbound Left (PM Peak Hour)
 - Eastbound Right (PM Peak Hour)
 - Westbound Left (AM and PM Peak Hour)
 - Westbound Right (PM Peak Hour)
 - Northbound Left (AM and PM Peak Hour)
 - Southbound Left (AM and PM Peak Hour)

The Future (2027) RIRO queuing results for the AM and PM peak hours are expressed by movement are presented in Table 14. Four (4) intersections have at least one movement with 95th percentile queues that exceed the available storage length in the morning and/or afternoon peak hour:

- Columbia Pike & Washington Boulevard Off-Ramp/S Orme Street
 - Southbound Right (AM and PM Peak Hour)
- Columbia Pike & S Joyce Street
 - Westbound Left (PM Peak Hour)
 - Northbound Left (AM and PM Peak Hour)
- Army Navy Drive & S Joyce Street
 - Northbound Left (PM Peak Hour)
 - Northbound Thru/Right (PM Peak Hour)
 - Southbound Left (AM and PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Eastbound Left (PM Peak Hour)
 - Westbound Left (PM Peak Hour)
 - Westbound Right (PM Peak Hour)
 - Northbound Left (PM Peak Hour)
 - Northbound Right (PM Peak Hour)
 - Southbound Left (AM Peak Hour)

2027 Future Analysis Results (with the proposed development) and Left-In/Right-Out (RIRO) Only Access on S Joyce Street

The Future (2027) LIRO results of the intersection capacity analyses for the AM and PM peak hours are expressed in level of service (LOS) and delay (seconds per vehicle) per movement and presented in Table 13. The capacity analysis results indicate that most intersections operate at acceptable LOS under the Future (2027) LIRO Conditions; however, two (2) intersections have one or more movements that operate at levels beyond acceptable thresholds in one or more peak hour:

- Army Navy Drive & S Joyce Street
 - Northbound Left (PM Peak Hour)
 - Southbound Left (PM Peak Hour)
- Army Navy Drive & S Hayes Street
 - Overall Intersection (PM Peak Hour)
 - Eastbound Left (PM Peak Hour)
 - Eastbound Right (PM Peak Hour)
 - Westbound Left (AM and PM Peak Hour)
 - Westbound Right (PM Peak Hour)
 - Northbound Left (AM and PM Peak Hour)
 - Southbound Left (AM and PM Peak Hour)

The Future (2027) LIRO queuing results for the AM and PM peak hours are expressed by movement and are presented in Table 14. Four (4) intersections have at least one movement with 95th percentile queues that exceed the available storage length in the morning and/or afternoon peak hour:

- Columbia Pike & Washington Boulevard Off-Ramp/S Orme Street
 - Southbound Right (AM and PM Peak Hour)
- Columbia Pike & S Joyce Street
 - Westbound Left (PM Peak Hour)
 - Northbound Left (AM and PM Peak Hour)
- Army Navy Drive & S Joyce Street
 - Northbound Left (PM Peak Hour)
 - Northbound Thru/Right (PM Peak Hour)
 - Southbound Left (AM and PM Peak Hour)
- Army Navy Drive & S Hayes Street

- Eastbound Left (PM Peak Hour)
- Westbound Left (PM Peak Hour)
- Westbound Right (PM Peak Hour)
- Northbound Left (PM Peak Hour)
- Northbound Right (PM Peak Hour)
- Southbound Left (AM Peak Hour)

2027 Future Mitigations

Mitigation measures were identified based on Arlington County standards and as outlined in the approved scoping document.

The proposed development is considered to have an impact at an intersection if any of the following conditions are met:

- The overall intersection or any movement operates at LOS F in the future conditions with the proposed development where it operates at LOS E or better in the background conditions without the proposed development;
- The overall intersection or any movement operates at LOS F during the background condition and the delay increases by more than 10 percent in the future conditions with the proposed development; or
- If any 95th percentile queue length in the future condition exceeds the available capacity where it does not in the background conditions or increases the 95th percentile queue length by more than 150 feet where it already exceeds the available capacity in the background conditions.

Following these guidelines, there are impacts to one (1) intersection under both the Future (2027) RIRO and LIRO Conditions. Mitigation measures were tested at this intersection, with results shown in Table 15 and Table 16, and with detailed Synchro reports included in the Technical Appendix. The following conclusions were made:

- Army Navy Drive & S Hayes Street
Under Future (2027) RIRO and LIRO Conditions, during the morning peak hour, delay for the northbound left movement, which is at LOS F in Background conditions, increases by more than 10 percent in comparison to Background conditions.

The increases in delay at this intersection attributable to the proposed development can be mitigated through signal timing adjustments.

Table 13: Capacity Analysis Results

Intersection and Movement	Existing (2022)				Background (2027)				Future (2027) - RIRO				Future (2027) - LIRO			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Columbia Pike & Washington Boulevard Off Ramp/S Orme Street																
Overall	27.1	C	34.6	C	28.8	C	35.8	D	27.4	C	35.7	D	27.3	C	35.7	D
Eastbound Left	58.7	E	52.1	D	58.9	E	52.8	D	58.9	E	52.8	D	58.9	E	52.8	D
Eastbound TR	7.8	A	9.0	A	7.9	A	9.1	A	8.0	A	9.1	A	7.9	A	9.1	A
Westbound TR	14.4	B	22.4	C	29.7	C	25.2	C	19.6	B	25.2	C	19.6	B	25.2	C
Northbound Left	52.8	D	58.1	E	52.1	D	58.5	E	52.1	D	58.5	E	52.1	D	58.5	E
Northbound Thru	52.5	D	57.8	E	52.0	D	58.4	E	52.0	D	58.4	E	52.0	D	58.4	E
Northbound Right	47.2	D	42.8	D	47.3	D	42.8	D	48.0	D	42.9	D	47.5	D	42.8	D
Southbound Left	64.8	E	66.7	E	64.8	E	66.3	E	64.8	E	66.3	E	64.8	E	66.3	E
Southbound Right	54.3	D	59.7	E	54.2	D	59.3	E	54.2	D	59.3	E	54.2	D	59.3	E
2. Columbia Pike & S Nash Street (Future)																
Overall	--	--	--	--	8.3	A	12.3	B	8.9	A	12.2	B	9.0	A	12.3	B
Eastbound LT	--	--	--	--	3.7	A	4.2	A	3.6	A	4.1	A	3.7	A	4.2	A
Westbound TR	--	--	--	--	6.5	A	11.2	B	8.5	A	11.2	B	8.5	A	11.2	B
Southbound LR	--	--	--	--	24.9	C	26.4	C	24.9	C	26.4	C	24.9	C	26.4	C
3. Columbia Pike & Air Force Memorial Drive																
Overall	--	--	--	--	4.1	A	5.4	A	4.6	A	5.4	A	4.6	A	5.5	A
Eastbound LT	0.4	A	0.6	A	--	--	--	--	--	--	--	--	--	--	--	--
Eastbound Thru	--	--	--	--	5.2	A	6.8	A	5.1	A	6.7	A	5.2	A	6.8	A
Westbound Thru	0.0		0.0		2.4	A	4.5	A	3.6	A	4.5	A	3.6	A	4.5	A
Westbound Right	0.0		0.0		--	--	--	--	--	--	--	--	--	--	--	--
Southbound LR	11.7	B	16.9	C	--	--	--	--	--	--	--	--	--	--	--	--
4. Columbia Pike & S Joyce Street																
Overall	12.4	B	38.4	D	30.0	C	36.3	D	31.2	C	36.3	D	32.0	C	36.5	D
Eastbound Left	6.0	A	12.9	B	--	--	--	--	--	--	--	--	--	--	--	--
Eastbound TR	6.8	A	14.0	B	14.1	B	33.1	C	17.7	B	33.3	C	18.5	B	33.6	C
Westbound Left	7.6	A	21.8	C	63.5	E	64.9	E	63.5	E	64.9	E	63.6	E	64.4	E
Westbound Thru	--	--	--	--	5.2	A	10.2	B	5.3	A	10.1	B	5.2	A	10.2	B
Westbound TR	6.3	A	14.6	B	--	--	--	--	--	--	--	--	--	--	--	--
Northbound Left	20.2	C	106.2	F	65.7	E	61.5	E	65.4	E	61.1	E	65.4	E	61.7	E
Northbound Right	--	--	--	--	33.6	C	18.9	B	33.6	C	19.2	B	32.4	C	18.7	B
Northbound TR	19.1	B	44.3	D	--	--	--	--	--	--	--	--	--	--	--	--
Southbound LTR	19.6	B	47.0	D	--	--	--	--	--	--	--	--	--	--	--	--
5. Columbia Pike and Site Driveway (Future)																

Intersection and Movement	Existing (2022)				Background (2027)				Future (2027) - RIRO				Future (2027) - LIRO			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Eastbound TR	--	--	--	--	--	--	--	--	0.0		0.0		0.0		0.0	
Northbound Right	--	--	--	--	--	--	--	--	10.3	B	10.6	B	10.2	B	10.5	B
6. Columbia Pike & Washington Boulevard SB Ramps (Future)																
Overall	--	--	--	--	9.7	A	11.8	B	10.0	A	11.6	B	10.4	B	11.6	B
Eastbound TR	--	--	--	--	4.0	A	4.5	A	4.7	A	4.6	A	4.9	A	4.7	A
Westbound LT	--	--	--	--	3.6	A	4.7	A	3.6	A	4.8	A	3.6	A	4.8	A
Southbound Left	--	--	--	--	26.4	C	24.5	C	26.4	C	24.5	C	26.4	C	24.5	C
Southbound Thru	--	--	--	--	24.6	C	23.8	C	24.6	C	23.8	C	24.7	C	23.8	C
Southbound Right	--	--	--	--	24.6	C	23.8	C	24.6	C	23.8	C	24.7	C	23.8	C
7. S Joyce Street & Site Driveway (Future)																
Westbound Right	--	--	--	--	--	--	--	--	9.5	A	10.2	B	9.5	A	10.2	B
Northbound TR	--	--	--	--	--	--	--	--	0.0		0.0		0.0		0.0	
Southbound Left	--	--	--	--	--	--	--	--	--	--	--	--	8.4	A	9.2	A
Southbound TR	--	--	--	--	0.0		0.0		0.0		0.0		0.0		0.0	
8. Army Navy Drive & S Joyce Street																
Overall	27.2	C	19.5	B	35.9	D	54.2	D	36.5	D	54.3	D	36.5	D	54.4	D
Eastbound Left	40.7	D	36.3	D	18.1	B	19.3	B	18.1	B	19.3	B	18.1	B	19.3	B
Eastbound Thru	44.8	D	33.0	C	--	--	--	--	--	--	--	--	--	--	--	--
Eastbound TR	--	--	--	--	24.1	C	22.2	C	24.1	C	22.2	C	24.1	C	22.2	C
Eastbound Right	34.0	C	31.1	C	--	--	--	--	--	--	--	--	--	--	--	--
Westbound Left	42.5	D	29.9	C	31.7	C	7.1	A	31.3	C	7.2	A	31.4	C	7.2	A
Westbound Thru	--	--	--	--	33.3	C	14.1	B	32.9	C	14.1	B	33.1	C	14.1	B
Westbound TR	46.9	D	21.2	C	--	--	--	--	--	--	--	--	--	--	--	--
Westbound Right	--	--	--	--	28.0	C	9.5	A	31.0	C	9.4	A	30.7	C	9.4	A
Northbound Left	15.3	B	22.7	C	44.8	D	181.0	F	44.8	D	181.0	F	44.8	D	181.0	F
Northbound Thru	15.9	B	17.5	B	--	--	--	--	--	--	--	--	--	--	--	--
Northbound TR	--	--	--	--	52.1	D	57.5	E	52.4	D	57.8	E	52.4	D	57.8	E
Northbound Right	15.1	B	16.7	B	--	--	--	--	--	--	--	--	--	--	--	--
Southbound Left	8.5	A	9.9	A	46.2	D	214.8	F	47.6	D	218.0	F	47.6	D	218.0	F
Southbound TR	7.4	A	10.3	B	39.3	D	60.1	E	39.3	D	60.1	E	39.3	D	60.1	E
9. Army Navy Drive & S Hayes Street																
Overall	45.8	D	56.1	E	79.2	E	92.8	F	79.3	E	92.8	F	79.3	E	92.8	F
Eastbound Left	19.4	B	66.1	E	75.0	E	314.6	F	75.0	E	314.2	F	75.0	E	314.2	F
Eastbound Thru	--	--	--	--	54.9	D	33.1	C	54.9	D	33.0	C	54.9	D	33.1	C
Eastbound TR	26.6	C	32.5	C	--	--	--	--	--	--	--	--	--	--	--	--
Eastbound Right	--	--	--	--	56.2	E	328.1	F	56.1	E	328.7	F	56.1	E	329.1	F

Intersection and Movement	Existing (2022)				Background (2027)				Future (2027) - RIRO				Future (2027) - LIRO			
	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Westbound Left	33.5	C	31.5	C	108.4	F	107.1	F	108.4	F	107.1	F	108.4	F	107.1	F
Westbound Thru	--	--	--	--	46.3	D	65.6	E	46.3	D	65.9	E	46.3	D	65.9	E
Westbound TR	38.3	D	58.0	E	--	--	--	--	--	--	--	--	--	--	--	--
Westbound Right	--	--	--	--	47.3	D	98.3	F	47.3	D	98.3	F	47.3	D	98.3	F
Northbound Left	67.8	E	297.4	F	86.2	F	93.9	F	96.3	F	93.8	F	96.3	F	93.8	F
Northbound Thru	40.0	D	37.0	D	64.2	E	39.7	D	64.2	E	39.7	D	64.2	E	39.7	D
Northbound Right	39.2	D	41.7	D	50.9	D	32.3	C	50.9	D	32.3	C	50.9	D	32.3	C
Southbound Left	99.9	F	24.2	C	190.0	F	178.0	F	190.0	F	178.0	F	190.0	F	178.0	F
Southbound TR	23.9	C	34.8	C	26.8	C	40.8	D	27.0	C	40.9	D	27.0	C	40.9	D

Table 14: Queuing Results

Intersection and Lane Group	EX ¹	BG ²	TF ³	Existing (2022)				Background (2027)				Future (2027) – RIRO				Future (2027) – LIRO			
	Storage Length (ft)	Storage Length (ft)	Storage Length (ft)	AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
				50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
1. Columbia Pike & Washington Boulevard Off Ramp/S Orme Street																			
Eastbound L	225	225	225	61	109	35	69	63	113	36	71	63	113	36	71	63	113	36	71
Eastbound TR	470	470	470	64	104	52	88	71	112	54	91	76	118	54	91	73	115	54	91
Westbound TR	1,500	570	570	44	72	182	265	71	85	153	360	45	71	154	361	45	71	154	361
Northbound L	800	800	800	120	176	216	298	113	181	220	303	113	181	220	303	113	181	220	303
Northbound T	800	800	800	125	183	220	302	118	187	223	307	118	187	223	307	118	187	223	307
Northbound R	>2,000	>2,000	>2,000	25	52	31	61	24	55	32	64	37	75	35	67	29	62	33	64
Southbound L	715	715	715	22	54	20	47	22	54	19	50	22	54	19	50	22	54	19	50
Southbound R	60	60	60	70	117	126	175	70	117	120	180	70	117	120	180	70	117	120	180
2. Columbia Pike & S Nash Street (Future)																			
Eastbound LT	--	570	570	--	--	--	--	26	53	22	38	27	54	22	38	26	53	22	38
Westbound TR	--	760	760	--	--	--	--	0	97	146	240	45	87	148	241	45	87	148	241
Southbound LR	--	775	775	--	--	--	--	62	97	97	149	62	97	97	149	62	97	97	149
3. Columbia Pike & Air Force Memorial Drive																			
Eastbound LT	1,500	--	--	--	0	--	1	--	--	--	--	--	--	--	--	--	--	--	--
Eastbound T	1,500	760	760	--	0	--	0	107	149	121	130	112	153	122	130	110	151	122	130
Westbound T	1,075	965	965	--	0	--	0	14	56	91	128	35	55	92	128	35	55	92	128
Westbound R	115	--	--	--	0	--	0	--	--	--	--	--	--	--	--	--	--	--	--
Southbound LR	400	--	--	--	2	--	3	--	--	--	--	--	--	--	--	--	--	--	--
4. Columbia Pike & S Joyce Street																			
Eastbound L	200	--	--	1	9	5	15	--	--	--	--	--	--	--	--	--	--	--	--
Eastbound TR	100	965	965	14	63	21	39	118	181	61	141	104	186	72	156	97	180	66	148
Westbound L	175	320	320	22	101	196	290	151	232	286	371	152	232	286	371	170	252	289	376

Intersection and Lane Group	EX ¹ Storage Length (ft)	BG ² Storage Length (ft)	TF ³ Storage Length (ft)	Existing (2022)				Background (2027)				Future (2027) – RIRO				Future (2027) – LIRO			
				AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
				50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Westbound TR	--	670	670	6	34	93	122	21	40	80	126	21	40	80	126	21	40	80	126
Northbound L	100	175	175	30	62	317	#518	163	235	323	412	164	236	324	413	164	236	325	416
Northbound TR	1,000	--	--	13	39	39	87	--	--	--	--	--	--	--	--	--	--	--	--
Northbound R	--	175	175	--	--	--	--	0	50	26	52	0	50	32	56	0	48	27	53
Southbound LTR	1,000	--	--	25	44	121	167	--	--	--	--	--	--	--	--	--	--	--	--
5. Columbia Pike and Site Driveway (Future)																			
Eastbound TR	--	--	250	--	--	--	--	--	0	--	0	--	0	--	0	--	0	--	0
Northbound R	--	--	50	--	--	--	--	--	0	--	0	--	1	--	8	--	1	--	8
6. Columbia Pike & Washington Boulevard SB Ramps (Future)																			
Eastbound TR	--	670	390	--	--	--	--	22	91	32	65	30	134	39	76	30	142	42	77
Westbound LT	--	480	480	--	--	--	--	13	40	26	71	13	40	27	72	13	40	27	72
Southbound L	--	1800	1800	--	--	--	--	31	54	30	54	31	54	30	54	31	54	30	54
Southbound T	--	760	760	--	--	--	--	0	0	0	0	0	0	0	0	0	0	0	0
Southbound R	--	500	500	--	--	--	--	0	0	0	0	0	0	0	0	0	0	0	0
7. S Joyce Street & Site Driveway (Future)																			
Westbound R	--	--	50	--	--	--	--	--	0	--	0	--	0	--	0	--	0	--	0
Northbound TR	--	--	700	--	--	--	--	--	0	--	0	--	0	--	0	--	0	--	0
Southbound L	--	--	50	--	--	--	--	--	--	--	--	--	--	--	--	--	2	--	0
Southbound TR	--	--	175	--	--	--	--	--	0	--	0	--	0	--	0	--	0	--	0
8. Army Navy Drive & S Joyce Street																			
Eastbound L	180	180	180	86	151	34	72	71	112	21	44	71	113	21	44	71	113	21	44
Eastbound T	550	--	--	175	264	73	112	--	--	--	--	--	--	--	--	--	--	--	--
Eastbound TR	--	550	550	--	--	--	--	116	156	39	75	116	156	39	75	116	156	39	75
Eastbound R	525	--	--	0	16	0	38	--	--	--	--	--	--	--	--	--	--	--	--
Westbound L	285	510	510	33	m73	133	m140	30	m73	51	m70	29	m72	51	m70	30	m73	51	m70
Westbound T	605	510	510	--	--	--	--	49	m106	336	m325	49	m105	335	m316	49	m106	335	m315
Westbound TR	600	--	--	10	20	123	m126	--	--	--	--	--	--	--	--	--	--	--	--
Westbound R	--	150	150	--	--	--	--	11	m49	19	m37	13	m57	20	m38	13	m56	20	m38
Northbound L	120	120	120	13	36	68	150	20	45	~119	#254	20	45	~119	#254	20	45	~119	#254
Northbound T	200	--	--	51	84	66	113	--	--	--	--	--	--	--	--	--	--	--	--
Northbound TR	--	175	175	--	--	--	--	115	163	178	234	121	170	180	236	121	170	180	236
Northbound R	100	--	--	0	7	0	41	--	--	--	--	--	--	--	--	--	--	--	--
Southbound L	150	125	125	77	121	60	113	190	#280	~186	#346	190	#287	~187	#348	190	#287	~187	#348
Southbound TR	1000	700	700	22	37	61	105	61	93	186	248	61	93	186	248	61	93	186	248
9. Army Navy Drive & S Hayes Street																			
Eastbound L	280	265	265	19	m34	148	#303	31	m73	~349	m#440	31	m73	~349	m#439	31	m73	~349	m#439
Eastbound T	--	450	450	--	--	--	--	212	m271	109	m137	213	m270	108	m137	213	m270	109	m137
Eastbound TR	450	--	--	98	121	82	133	--	--	--	--	--	--	--	--	--	--	--	--
Eastbound R	450	100	100	--	--	--	--	7	m17	1	m22	7	m17	2	m22	7	m17	1	m22

Intersection and Lane Group	EX ¹ Storage Length (ft)	BG ² Storage Length (ft)	TF ³ Storage Length (ft)	Existing (2022)				Background (2027)				Future (2027) – RIRO				Future (2027) – LIRO			
				AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak		AM Peak		PM Peak	
				50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Westbound L	210	175	175	32	65	44	80	62	#153	94	#204	62	#153	94	#204	62	#153	94	#204
Westbound T	440	430	430	--	--	--	--	88	128	278	#373	87	131	278	#374	87	131	278	#374
Westbound TR	450	--	--	42	81	220	#309	--	--	--	--	--	--	--	--	--	--	--	--
Westbound R	--	125	125	--	--	--	--	0	119	186	#465	0	119	186	#465	0	119	186	#465
Northbound L	210	165	165	44	#88	~225	#353	66	#146	216	#370	72	#161	217	#372	72	#161	217	#372
Northbound T	350	720	720	73	100	97	131	104	140	121	155	104	140	121	155	104	140	121	155
Northbound R	60	100	100	33	68	106	176	37	75	97	153	37	75	97	153	37	75	97	153
Southbound L	1000	810	810	~614	#806	171	252	~1160	#1421	~497	#712	~1160	#1421	~497	#712	~1160	#1421	~497	#712
Southbound TR	1000	810	810	264	301	222	273	298	344	303	357	301	348	304	358	300	347	304	358

1. Existing (2022)

2. Future Background (2027)

3. Total Future (2027)

95th percentile volume exceeds capacity, queue may be longer.

m Volume for 95th percentile queue is metered by upstream signal.

~ Volume exceeds capacity, queue is theoretically infinite.

Table 15: Capacity Analysis Results

Intersection and Movement	Background (2027)		Future (2027) - RIRO		Future (2027) - LIRO		Mitigated (2027) - RIRO		Mitigated (2027) - LIRO	
	AM Peak		AM Peak		AM Peak		AM Peak		AM Peak	
	Delay	LOS	LOS	Delay	LOS	Delay	Delay	LOS	Delay	LOS
1. Columbia Pike & Washington Boulevard Off Ramp/S Orme Street										
Overall	28.8	C	27.4	C	27.3	C	27.4	C	27.3	C
Eastbound Left	58.9	E	58.9	E	58.9	E	58.9	E	58.9	E
Eastbound TR	7.9	A	8.0	A	7.9	A	8.0	A	7.9	A
Westbound TR	29.7	C	19.6	B	19.6	B	19.6	B	19.6	B
Northbound Left	52.1	D	52.1	D	52.1	D	52.1	D	52.1	D
Northbound Thru	52.0	D	52.0	D	52.0	D	52.0	D	52.0	D
Northbound Right	47.3	D	48.0	D	47.5	D	48.0	D	47.5	D
Southbound Left	64.8	E	64.8	E	64.8	E	64.8	E	64.8	E
Southbound Right	54.2	D	54.2	D	54.2	D	54.2	D	54.2	D
2. Columbia Pike & S Nash Street (Future)										
Overall	8.3	A	8.9	A	9.0	A	8.9	A	9.0	A
Eastbound LT	3.7	A	3.6	A	3.7	A	3.6	A	3.7	A
Westbound TR	6.5	A	8.5	A	8.5	A	8.5	A	8.5	A
Southbound LR	24.9	C	24.9	C	24.9	C	24.9	C	24.9	C
3. Columbia Pike & Air Force Memorial Drive										
Overall	4.1	A	4.6	A	4.6	A	4.6	A	4.6	A
Eastbound Thru	5.2	A	5.1	A	5.2	A	5.1	A	5.2	A
Westbound Thru	2.4	A	3.6	A	3.6	A	3.6	A	3.6	A
4. Columbia Pike & S Joyce Street										
Overall	30.0	C	31.2	C	32.0	C	31.2	C	32.0	C
Eastbound TR	14.1	B	17.7	B	18.5	B	17.7	B	18.5	B
Westbound Left	63.5	E	63.5	E	63.6	E	63.5	E	63.6	E
Westbound Thru	5.2	A	5.3	A	5.2	A	5.3	A	5.2	A
Northbound Left	65.7	E	65.4	E	65.4	E	65.4	E	65.4	E
Northbound Right	33.6	C	33.6	C	32.4	C	33.6	C	32.4	C
5. Columbia Pike and Site Driveway (Future)										
Eastbound TR	--	--	0.0		0.0		0.0		0.0	
Northbound Right	--	--	10.3	B	10.2	B	10.3	B	10.2	B
6. Columbia Pike & Washington Boulevard SB Ramps (Future)										
Overall	9.7	A	10.0	A	10.4	B	10.0	A	10.4	B
Eastbound TR	4.0	A	4.7	A	4.9	A	4.7	A	4.9	A
Westbound LT	3.6	A	3.6	A	3.6	A	3.6	A	3.6	A

Intersection and Movement	Background (2027)		Future (2027) - RIRO		Future (2027) - LIRO		Mitigated (2027) - RIRO		Mitigated (2027) - LIRO	
	AM Peak		AM Peak		AM Peak		AM Peak		AM Peak	
	Delay	LOS	LOS	Delay	LOS	Delay	Delay	LOS	Delay	LOS
Southbound Left	26.4	C	26.4	C	26.4	C	26.4	C	26.4	C
Southbound Thru	24.6	C	24.6	C	24.7	C	24.6	C	24.7	C
Southbound Right	24.6	C	24.6	C	24.7	C	24.6	C	24.7	C
7. S Joyce Street & Site Driveway (Future)										
Westbound Right	--	--	9.5	A	9.5	A	9.5	A	9.5	A
Northbound TR	--	--	0.0		0.0		0.0		0.0	
Southbound Left	--	--	--	--	8.4	A	--	--	8.4	A
Southbound TR	0.0		0.0		0.0		0.0		0.0	
8. Army Navy Drive & S Joyce Street										
Overall	35.9	D	36.5	D	36.5	D	36.5	D	36.5	D
Eastbound Left	18.1	B	18.1	B	18.1	B	18.1	B	18.1	B
Eastbound TR	24.1	C	24.1	C	24.1	C	24.1	C	24.1	C
Westbound Left	31.7	C	31.3	C	31.4	C	32.0	C	32.0	C
Westbound Thru	33.3	C	32.9	C	33.1	C	33.3	C	33.5	C
Westbound Right	28.0	C	31.0	C	30.7	C	30.9	C	30.5	C
Northbound Left	44.8	D	44.8	D	44.8	D	44.8	D	44.8	D
Northbound TR	52.1	D	52.4	D	52.4	D	52.4	D	52.4	D
Southbound Left	46.2	D	47.6	D	47.6	D	47.6	D	47.6	D
Southbound TR	39.3	D	39.3	D	39.3	D	39.3	D	39.3	D
9. Army Navy Drive & S Hayes Street										
Overall	79.2	E	79.3	E	79.3	E	79.1	E	79.2	E
Eastbound Left	75.0	E	75.0	E	75.0	E	75.6	E	75.6	E
Eastbound Thru	54.9	D	54.9	D	54.9	D	54.4	D	54.4	D
Eastbound Right	56.2	E	56.1	E	56.1	E	55.6	E	55.6	E
Westbound Left	108.4	F	108.4	F	108.4	F	108.4	F	108.4	F
Westbound Thru	46.3	D	46.3	D	46.3	D	46.3	D	46.3	D
Westbound Right	47.3	D	47.3	D	47.3	D	47.3	D	47.3	D
Northbound Left	86.2	F	96.3	F	96.3	F	84.5	F	84.5	F
Northbound Thru	64.2	E	64.2	E	64.2	E	64.2	E	64.2	E
Northbound Right	50.9	D	50.9	D	50.9	D	50.9	D	50.9	D
Southbound Left	190.0	F	190.0	F	190.0	F	190.0	F	190.0	F
Southbound TR	26.8	C	27.0	C	27.0	C	27.5	C	27.5	C

Table 16: Queuing Results

Intersection and Lane Group	BG ¹ Storage Length (ft)	TF ² Storage Length (ft)	Background (2027)		Future (2027) – RIRO		Future (2027) – LIRO		Mitigated (2027) - RIRO		Mitigated (2027) – LIRO	
			AM Peak		AM Peak		AM Peak		AM Peak		AM Peak	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
1. Columbia Pike & Washington Boulevard Off Ramp/S Orme Street												
Eastbound L	225	225	63	113	63	113	63	113	63	113	63	113
Eastbound TR	470	470	71	112	76	118	73	115	76	118	73	115
Westbound TR	570	570	71	85	45	71	45	71	45	71	45	71
Northbound L	800	800	113	181	113	181	113	181	113	181	113	181
Northbound T	800	800	118	187	118	187	118	187	118	187	118	187
Northbound R	>2,000	>2,000	24	55	37	75	29	62	37	75	29	62
Southbound L	715	715	22	54	22	54	22	54	22	54	22	54
Southbound R	60	60	70	117	70	117	70	117	70	117	70	117
2. Columbia Pike & S Nash Street (Future)												
Eastbound LT	570	570	26	53	27	54	26	53	27	54	26	53
Westbound TR	760	760	0	97	45	87	45	87	45	87	45	87
Southbound LR	775	775	62	97	62	97	62	97	62	97	62	97
3. Columbia Pike & Air Force Memorial Drive												
Eastbound LT	--	--										
Eastbound T	760	760	107	149	112	153	110	151	112	153	110	151
Westbound T	965	965	14	56	35	55	35	55	35	55	35	55
Westbound R	--	--										
Southbound LR	--	--										
4. Columbia Pike & S Joyce Street												
Eastbound L	--	--										
Eastbound TR	965	965	118	181	104	186	97	180	104	186	97	180
Westbound L	320	320	151	232	152	232	170	252	152	232	170	252
Westbound TR	670	670	21	40	21	40	21	40	21	40	21	40
Northbound L	175	175	163	235	164	236	164	236	164	236	164	236
Northbound TR	--	--										
Northbound R	175	175	0	50	0	50	0	48	0	50	0	48
Southbound LTR	--	--										
5. Columbia Pike and Site Driveway (Future)												
Eastbound TR	--	250		0		0		0		0		0
Northbound R	--	50		0		1		1		1		1
6. Columbia Pike & Washington Boulevard SB Ramps (Future)												
Eastbound TR	670	390	22	91	30	134	30	142	30	134	30	142
Westbound LT	460	460	13	40	13	40	13	40	13	40	13	40
Southbound L	1900	1900	31	54	31	54	31	54	31	54	31	54
Southbound T	760	760	0	0	0	0	0	0	0	0	0	0
Southbound R	500	500	0	0	0	0	0	0	0	0	0	0
7. S Joyce Street & Site Driveway (Future)												

Intersection and Lane Group	BG ¹ Storage Length (ft)	TF ² Storage Length (ft)	Background (2027)		Future (2027) – RIRO		Future (2027) – LIRO		Mitigated (2027) - RIRO		Mitigated (2027) – LIRO	
			AM Peak		AM Peak		AM Peak		AM Peak		AM Peak	
			50th	95th	50th	95th	50th	95th	50th	95th	50th	95th
Westbound R	--	50		0		0		0		0		0
Northbound TR	--	700		0		0		0		0		0
Southbound L	--	50						2				2
Southbound TR	--	175		0		0		0		0		0
8. Army Navy Drive & S Joyce Street												
Eastbound L	160	160	71	112	71	113	71	113	71	113	71	113
Eastbound T	--	--										
Eastbound TR	550	550	116	156	116	156	116	156	116	156	116	156
Eastbound R	--	--										
Westbound L	510	510	30	m73	29	m72	30	m73	29	m72	30	m73
Westbound T	510	510	49	m106	49	m105	49	m106	49	m106	49	m107
Westbound TR	--	--										
Westbound R	150	150	11	m49	13	m57	13	m56	13	m57	12	m56
Northbound L	120	120	20	45	20	45	20	45	20	45	20	45
Northbound T	--	--										
Northbound TR	175	175	115	163	121	170	121	170	121	170	121	170
Northbound R	--	--										
Southbound L	125	125	190	#280	190	#287	190	#287	190	#287	190	#287
Southbound TR	700	700	61	93	61	93	61	93	61	93	61	93
9. Army Navy Drive & S Hayes Street												
Eastbound L	265	265	31	m73	31	m73	31	m73	30	m73	30	m73
Eastbound T	450	450	212	m271	213	m270	213	m270	213	m270	213	m270
Eastbound TR	--	--										
Eastbound R	100	100	7	m17	7	m17	7	m17	7	m17	7	m17
Westbound L	175	175	62	#153	62	#153	62	#153	62	#153	62	#153
Westbound T	430	430	86	128	87	131	87	131	87	131	87	131
Westbound TR	--	--										
Westbound R	125	125	0	119	0	119	0	119	0	119	0	119
Northbound L	165	165	66	#146	72	#161	72	#161	71	#150	71	#150
Northbound T	720	720	104	140	104	140	104	140	104	140	104	140
Northbound R	100	100	37	75	37	75	37	75	37	75	37	75
Southbound L	810	810	~1160	#1421	~1160	#1421	~1160	#1421	~1160	#1421	~1160	#1421
Southbound TR	810	810	298	344	301	348	300	347	306	353	305	352

1. Future Background (2027)

2. Total Future (2027)

95th percentile volume exceeds capacity, queue may be longer.

m Volume for 95th percentile queue is metered by upstream signal.

~ Volume exceeds capacity, queue is theoretically infinite.

Crash Data Review

This chapter reviews available crash data within the study area, reviews potential impacts of the proposed development on crash rates and informs future transportation improvements that work toward the County’s goals outlined in the Vision Zero Action Plan.

VDOT Crash Data

Based on guidelines contained in the Safety Analysis Guidance (May 2021) provided by Arlington County DES, crash data from 2018 to 2022 was obtained from the VDOT Crash Analysis Tool for crashes occurring in the vicinity of the site. The crash data used in the analysis is included in the Technical Appendix.

Based on the historical crash data, a total of 113 crashes occurred at study area intersections between 2018 and 2022. The year with the highest number of crashes was 2019 with 35 crashes per year, while the year with the lowest number of crashes was 2020 with ten (10) crashes. Figure 43 shows the number of crashes per year in in the study area over the last five years. The data obtained from VDOT shows that the number of reported crashes generally varies from year to year.

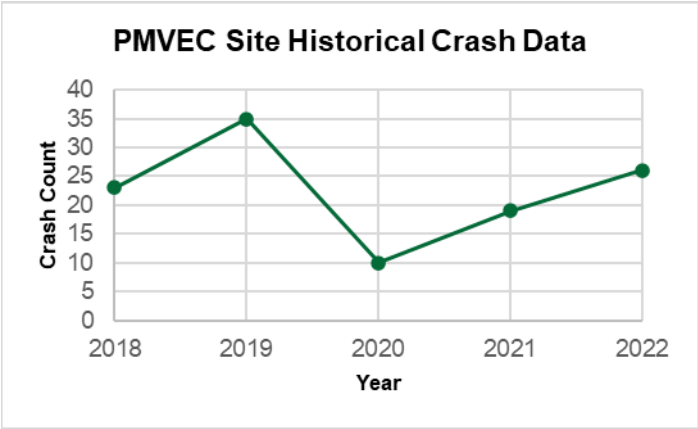


Figure 43: Historical Crash Data

Crash Characteristics

Crash Severity

According to the 2017 VDOT Crash Data Manual, crash severity is measured using the KABCO scale as per the Model Minimum Uniform Crash Criteria (MMUCC) based on the most severe injury to any person involved in the crash. The KABCO scale definitions are as follows:

- K: Fatal Injury

- A: Suspected Serious Injury
- B: Suspected Minor Injury
- C: Possible Injury
- O: Property Damage Only (No Apparent Injury)

From 2018 to 2022, 73% were classified as O (Property Damage Only) and 21% were classified as B (Suspected Minor Injury). No reported crashes involved fatal injury, and no reported crashes involved suspected serious injuries. Table 17 shows the number of crashes according to its severity.

Table 17: Crash Count by Severity (2018-2022)

Crash Severity	Count	%
K	0	0%
A	2	2%
B	24	21%
C	4	4%
PDO	83	73%
Total	113	100%

Collision Type

The most common type of collision found in the study area was angle collisions, with 82% of crashes occurring in this manner, followed by pedestrian and head on collisions for a combined 10% of crashes. Table 18 summarizes the collision type for all analyzed crashes.

Table 18: Crash County by Collision Type

Collision Type	Count	%
Rear End	3	3%
Angle	93	82%
Pedestrian	2	2%
Sideswipe - Same Direction	2	2%
Other	6	5%
Head On	6	5%
Fixed Object - Off Road	1	1%
Total	113	100%

Crash Factors

Several factors that contribute to crashes were reviewed as part of this safety analysis. These factors include environmental factors, driver behavior, and vehicle characteristics.

Environmental Factors

Light conditions at the moment of the crash can contribute to the quantity and severity of crashes. For the data analyzed, 95% of the crashes occurred during daylight (65%) or during darkness in a lighted road (30%). This information suggests that, in the majority of crashes, light condition might not have been the primary cause for the crash. Table 19 summarizes the light conditions for crashes in the vicinity of the Pentagon Memorial Visitor Education Center site.

Table 19: Crash Count by Light Condition

Light Condition	Count	%
Daylight	73	65%
Darkness - road lighted	34	30%
Dusk	4	4%
Darkness - road not lighted	0	0%
Dawn	1	1%
Total	113	100%

Driver Behavior

The intentional or unintentional characteristics and actions that a driver performs while operating a vehicle also contribute to crashes. As shown in Table 20, a distracted driver was reported in 12% of the analyzed crashes, while alcohol and speeding were involved in 3% and 18% of the crashes, respectively. This information suggests that, in the majority of cases, driver behavior might not have been the primary cause of the crash but is a contributing cause.

Table 20: Crash Count by Driver Behavior Factors

Driver Behavior Factors	Count	%
<i>Distracted Driver?</i>		
Yes	14	12%
No	99	88%
<i>Speeding?</i>		
Yes	20	18%
No	93	82%
<i>Alcohol Involved?</i>		
Yes	3	3%
No	110	97%
Total	113	100%

Vehicle Characteristics

Vehicle characteristics including type of vehicle and vehicle size were analyzed to determine their contribution to crashes in the vicinity of the Pentagon Memorial Visitor Education Center site.

As shown in Table 21, three (3) crashes involving motorcyclists have been reported in the past five (5) years and one (1) crash was reported to involve a bicyclist. In addition, four (4) crashes (4%) reported a large truck being involved in the crash. In terms of transportation modes other than automobiles, two (2) crashes (2%) were reported to involve a pedestrian.

Table 21: Crash Count by Vehicle Characteristics

Vehicle Characteristics Factors	Count	%
<i>Large Truck Involved</i>		
Yes	4	4%
No	109	96%
<i>Motorcycle Involved</i>		
Yes	3	3%
No	110	97%
<i>Bike Involved</i>		
Yes	1	1%
No	112	99%
<i>Pedestrian Involved</i>		
Yes	2	2%
No	111	98%
Total	113	100%

Findings

According to the VDOT historical crash data for the study area, the location with the greatest number of reported crashes was the intersection of S Hayes Street and Army Navy Drive, with 91 of the 113 (or 80%) reported crashes occurring at or near this intersection. No crashes were classified as K (fatal injury) or A (suspected serious injury).

As part of the DAR project, new pedestrian facilities that meet or exceed Arlington County requirements will be provided along the street frontage of the site. These improvements are consistent with several County-wide and national guidelines which prioritize shifting trips to non-auto modes, complete streets principles, and safety for all users, including the Arlington Master Transportation Plan, Vision Zero Action Plan, and NACTO Urban Streets Design Guide. The project does not propose changes to nearby intersections or the roadway network. As such, no change is anticipated to the crash rates in the vicinity of the site.

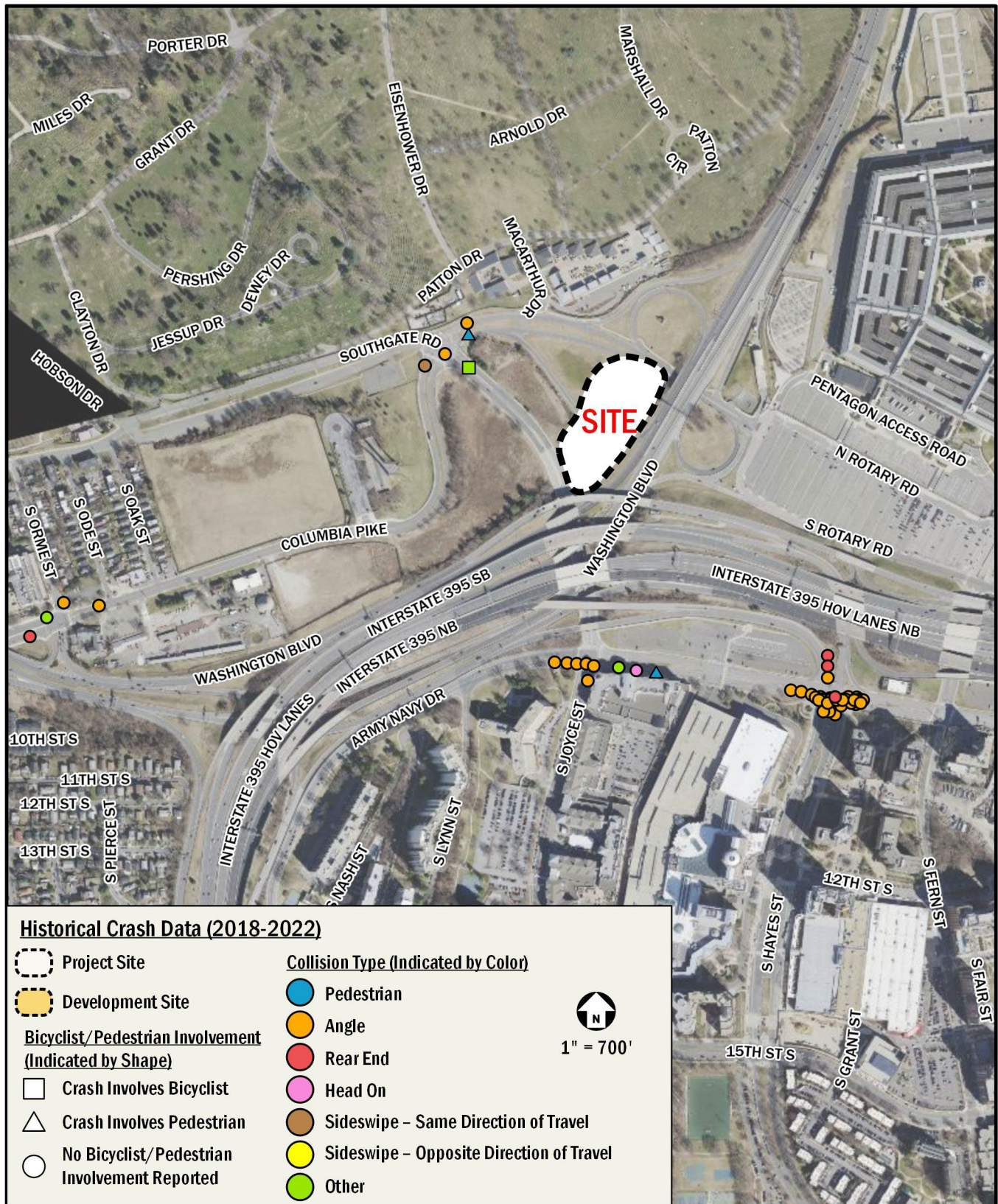


Figure 44: Historical Crash Data (2018-2022)

Transportation Management Plan Framework

A Transportation Management Plan (TMP) has many components that are tailored to accommodate a given facility with the goal being the reduction of automobile trips by encouraging alternative forms of transportation. Management measures taken by the proposed Pentagon Memorial Visitor Education Center development can be monitored and adjusted as needed to continually create opportunities to reduce the amount of vehicular traffic generated by the site. While a transportation management plan is not explicitly required for this site, this section provides a framework to encourage the use of transit, walking, bicycling, and carpooling.

TMP measures for the site may include, but not be limited to, the following items:

Participation and Funding

- Establish and maintain an active, ongoing relationship with Arlington Transportation Partners (ATP), or successor entity, at no cost to the developer, on behalf of the property owner.
- A Visitor Education Center staff member will be designed as Property Transportation Coordinator (PTC) to be primary point of contact with the County and undertake the responsibility for coordinating the implementation of the site's transportation management measures.

Passenger Loading Management

- A Visitor Education Center staff member will be designated as Tour Group Coordinator to coordinate with and schedule tour groups. Due to the layout and nature of the Visitor Education Center, staggered tour group arrival times are necessary and will be beneficial to the dispersal of tour bus loading/unloading activity. The coordinator will also provide tour groups with information and resources about arrival options. This includes transit information for interested parties, or routing and parking information for groups who plan on traveling via motorcoach.
- A VEC staff member will be assigned to greet buses as they arrive to drop-off passengers. The staff member will verify schedules with bus drivers to maximize utilization of the curb space for all scheduled buses. After visitors are dropped off, the staff member will have the responsibility of guiding bus drivers to vacate the bus pick-up/drop-off area, exit the site via the Columbia Pike driveway, and

then return to the site using the S Joyce Driveway, where they will wait in the designated bus layover zone, as shown in Figure 16.

- A page will be provided on the VEC website that provides information for tour bus operators. The webpage will outline drop-off, pick-up, and parking procedures. It will also provide a link to the Arlington County webpage with information on tour bus parking guidelines and suggestions.

Facilities and Improvements

- Provide in the visitor education center a transportation information display(s) which follow the Arlington County Neighborhood Transportation Information Display Standards.
- Provide secure bike racks appropriately located to support bicycle access to the visitor education center.
- Provide space for tour buses to pick-up/drop-off passengers.
- Provide space on-site for tour buses to park or lay over while tour groups are visiting the VEC or the Pentagon 9/11 Memorial

Promotions, Services, Policies

- The Visitor Education Center will encourage its visitors to use the local transit system to access the site. Links to the WMATA and Arlington Transit websites will be added to the VEC website. The website will note that its location is accessible from the Pentagon City Metro Station and the bus stop located at Columbia Pike and S Joyce Street.
- Prepare, reproduce and distribute, in digital or hard copy, materials provided by Arlington County, which includes site-specific transit, bike, walk, and rideshare related information, to each new employee.

Summary and Conclusions

This report concludes that the proposed development will not have a detrimental impact to the surrounding transportation and roadway network assuming that all planned site design elements and recommended mitigation measures are implemented.

There are several local transportation options near the site that serve vehicular, transit, walking, and cycling trips.

In addition to several principal arterials, the site is served by a local vehicular network that includes several minor arterials and collectors such as S Joyce Street, S Hayes Street, and Army Navy Drive. In addition, there is an existing network of local roadways that provide access to the site.

The proposed development will construct a Visitor Education Center to educate and remember the events of September 11, 2001 at the Pentagon and provide logistical support for the existing 9/11 Pentagon Memorial. The 9/11 Pentagon Memorial is located northeast of the proposed site near the Pentagon. The proposed building will house an exhibit gallery that educates visitors on the events surrounding 9/11. A multi-purpose conference center and education space is also proposed within the same building, which will be used for both daytime conferences/meetings and evening special events. The building will be approximately 50,000 gross square feet in size over two floors. The exhibit space is approximately 15,000 square feet with ancillary support spaces and the Conference Center is approximately 5,200 square feet with pre-function and ancillary support spaces.

The proposed development will provide approximately 100 parking spaces in an on-site surface parking lot. Vehicular access to the site will be provided via two driveways: one on Columbia Pike and one on S Joyce Street. In the current version of the site plan, both of these driveways are designed to be right-in/right-out only. The project team is currently studying the feasibility of an alternative configuration of the S Joyce Street driveway, in which a median break would be provided on S Joyce Street to permit southbound left turns into the site. Loading space will be provided to accommodate the practical needs of the development and is located south of the building.

A number of planned transportation improvements in the vicinity of the Pentagon Memorial Visitor Education Center development are expected to be complete by 2027. The full list of improvements is detailed in the report, but projects include:

- Arlington National Cemetery Southern Expansion (ANCSE)
- Defense Access Roads (DAR) Project
- Columbia Pike Multimodal Street Improvements
- Army Navy Drive Complete Street
- Transitway Extension to Pentagon City

A capacity analysis was developed to compare the future roadway network with and without the proposed development. Traffic projections for 2027 are based on existing volumes, plus traffic generated by approved nearby background developments, and traffic generated by the proposed Pentagon Memorial Visitor Education Center development.

Mitigation measures were identified based on Arlington County standards and as outlined in the approved scoping document (contained in the Technical Appendix). The proposed development is considered to have an impact at an intersection if any of the outlined conditions are met.

Following these guidelines, mitigation measures were explored and included the following recommendation(s):

- Adjustments to signal timings at one (1) intersection

With these mitigations in place, the analysis shows that traffic operations with the proposed development will improve or are consistent with the Background scenario at many intersections.

The development has many positive elements contained within its design that minimize potential transportation impacts, including:

- The proposed development's close proximity to the Pentagon City Metro Station, Pentagon Metro Station, and multiple bus lines.
- Improvements to the pedestrian facilities adjacent to the site that meet or exceed Arlington County and ADA requirements.
- The installation of short-term bicycle parking spaces on site.
- The provision of a bus pick-up/drop-off zone and bus layover zone to accommodate private tour buses and shuttles on site.
- Limited on-site parking, which will promote the use of non-auto modes of travel to and from the proposed development.

- A Transportation Management Plan (TMP) framework that aims to reduce the demand of single-occupancy, private vehicles to/from the proposed development during peak period travel times.

As noted above, this report concludes that the proposed development will not have a detrimental impact to the surrounding transportation and roadway network assuming that all planned site design elements and recommended mitigation measures are implemented.

Appendix H

Determination of No Hazard to Air
Navigation



Mail Processing Center
Federal Aviation Administration
Southwest Regional Office
Obstruction Evaluation Group
10101 Hillwood Parkway
Fort Worth, TX 76177

Aeronautical Study No.
2023-AEA-6196-OE

Issued Date: 10/25/2023

MGAC - Kevin Lippincott
Pentagon Memorial Fund
73 Eleventh Street, NW
Washington, DC 20001

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Building 9/11 Pentagon Visitor Education Center
Location:	Arlington, VA
Latitude:	38-52-09.08N NAD 83
Longitude:	77-03-43.94W
Heights:	47 feet site elevation (SE) 55 feet above ground level (AGL) 102 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure does not exceed obstruction standards and would not be a hazard to air navigation provided the following condition(s), if any, is(are) met:

It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be e-filed any time the project is abandoned or:

- ☐ At least 10 days prior to start of construction (7460-2, Part 1)
☒ Within 5 days after the construction reaches its greatest height (7460-2, Part 2)

Based on this evaluation, marking and lighting are not necessary for aviation safety. However, if marking/lighting are accomplished on a voluntary basis, we recommend it be installed in accordance with FAA Advisory circular 70/7460-1 M.

While the structure does not constitute a hazard to air navigation, it would be located within or near a military training area and/or route.

This determination expires on 04/25/2025 unless:

- (a) the construction is started (not necessarily completed) and FAA Form 7460-2, Notice of Actual Construction or Alteration, is received by this office.
- (b) extended, revised, or terminated by the issuing office.

- (c) the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

NOTE: REQUEST FOR EXTENSION OF THE EFFECTIVE PERIOD OF THIS DETERMINATION MUST BE E-FILED AT LEAST 15 DAYS PRIOR TO THE EXPIRATION DATE. AFTER RE-EVALUATION OF CURRENT OPERATIONS IN THE AREA OF THE STRUCTURE TO DETERMINE THAT NO SIGNIFICANT AERONAUTICAL CHANGES HAVE OCCURRED, YOUR DETERMINATION MAY BE ELIGIBLE FOR ONE EXTENSION OF THE EFFECTIVE PERIOD.

This determination is based, in part, on the foregoing description which includes specific coordinates, heights, frequency(ies) and power. Any changes in coordinates, heights, and frequencies or use of greater power, except those frequencies specified in the Colo Void Clause Coalition; Antenna System Co-Location; Voluntary Best Practices, will void this determination. Any future construction or alteration, including increase to heights, power, or the addition of other transmitters, requires separate notice to the FAA. This determination includes all previously filed frequencies and power for this structure.

If construction or alteration is dismantled or destroyed, you must submit notice to the FAA within 5 days after the construction or alteration is dismantled or destroyed.

This determination does include temporary construction equipment such as cranes, derricks, etc., which may be used during actual construction of the structure. However, this equipment shall not exceed the overall heights as indicated above. Equipment which has a height greater than the studied structure requires separate notice to the FAA.

This determination concerns the effect of this structure on the safe and efficient use of navigable airspace by aircraft and does not relieve the sponsor of compliance responsibilities relating to any law, ordinance, or regulation of any Federal, State, or local government body.

A copy of this determination will be forwarded to the Federal Communications Commission (FCC) because the structure is subject to their licensing authority.

If we can be of further assistance, please contact our office at (404) 305-6531, or darin.clipper@faa.gov. On any future correspondence concerning this matter, please refer to Aeronautical Study Number 2023-AEA-6196-OE.

Signature Control No: 586590247-602936750

(DNE)

Darin Clipper
Specialist

Attachment(s)
Frequency Data
Map(s)

cc: FCC

Frequency Data for ASN 2023-AEA-6196-OE

LOW FREQUENCY	HIGH FREQUENCY	FREQUENCY UNIT	ERP	ERP UNIT
698	806	MHz	1000	W
806	901	MHz	500	W
806	824	MHz	500	W
824	849	MHz	500	W
851	866	MHz	500	W
869	894	MHz	500	W
896	901	MHz	500	W
1710	1755	MHz	500	W
1850	1910	MHz	1640	W
1850	1990	MHz	1640	W
1930	1990	MHz	1640	W
1990	2025	MHz	500	W
2110	2200	MHz	500	W
2305	2310	MHz	2000	W
2305	2360	MHz	2000	W
2345	2360	MHz	2000	W
2496	2690	MHz	500	W

