

INTERSTATE 395 EXPRESS LANES NORTHERN EXTENSION

REVISED ENVIRONMENTAL ASSESSMENT

FEBRUARY 2017



ExpressLanes

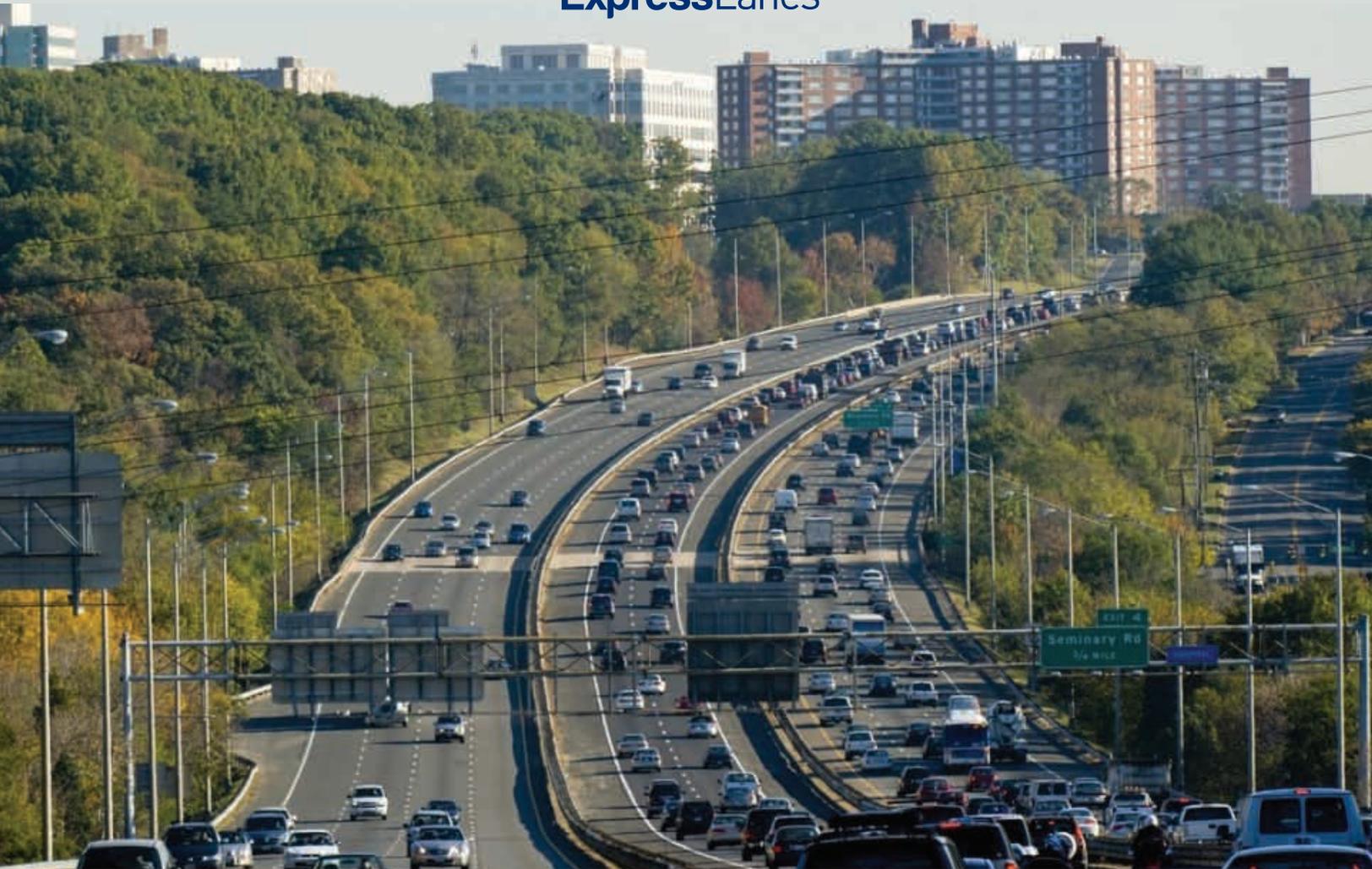


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List of Acronyms

AASHTO	American Association of State Highway and Transportation Officials
APE	Area of Potential Effect
BEA	Bureau of Economic Analysis
BMP	Best Management Practice
BRT	Bus Rapid Transit
C-CAP	Coastal Change Analysis Program
CAA	Clean Air Act
CE	Categorical Exclusion
CEQ	Council on Environmental Quality
CLRP	Constrained Long-Range Plan
CO	Carbon Monoxide
CWA	Clean Water Act
dba	Decibel
DC SHPO	District of Columbia State Historic Preservation Office
DDOT	District of Columbia Department of Transportation
DEIS	Draft Environmental Impact Statement
DoD	Department of Defense
DRPT	Department of Rail and Public Transportation
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EFLHD	Eastern Federal Lands Highway Division
EJ	Environmental Justice
EPA	Environmental Protection Agency
ESA	Environmental Site Assessment
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FONSI	Finding of No Significant Impact
FRA	Federal Railroad Administration
FY	Fiscal Year
GEMS	Geospatial and Educational Mapping System
GIS	Geographic Information Systems

GP	General Purpose
HHS	Health and Human Services
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
HUD	Housing and Urban Development
I-395	Interstate 395
ICE	Indirect and Cumulative Effects
IMR	Interchange Modification Report
L _{eq}	Equivalent Sound Level
LMI	Labor Market Information
MS4	Municipal Separate Storm Sewer System
MSATs	Mobile Source Air Toxics
MWCOG	Metropolitan Washington Council of Governments
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NB	Northbound
NCHRP	National Cooperative Highway Research Program
NCRTPB	National Capital Region Transportation Planning Board
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NHS	National Highway System
NOAA	National Oceanic and Atmospheric Administration
NO _x	Oxides of Nitrogen
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NVTA	Northern Virginia Transportation Authority
NWF	National Wildlife Federation
PIM	Public Information Meeting
PM	Particulate Matter
PPTA	Public-Private Transportation Act
PTC	Pentagon Transit Center

RECs	Recognized Environmental Concerns
SB	Southbound
SIP	State Implementation Plan
SOV	Single-Occupancy Vehicle
STAG	Stakeholder Technical Advisory Group
STRAHNET	Strategic Highway Network
SWM	Stormwater Management
SYIP	Six-Year Improvement Program
TDM	Transportation Demand Management
TIP	Transportation Improvement Program
TRB	Transportation Research Board
TWG	Technical Working Group
USACE	United States Army Corps of Engineers
USDOT	United State Department of Transportation
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VAFWIS	Virginia Fish and Wildlife Information Service
VDACS	Virginia Department of Agricultural and Consumer Services
VDCR	Virginia Department of Conservation and Recreation
VDEQ	Virginia Department of Environmental Quality
VDGIF	Virginia Department of Game and Inland Fisheries
VDH	Virginia Department of Health
VDHR	Virginia Department of Historic Resources
VDMME	Virginia Department of Mines, Minerals and Energy
VDOT	Virginia Department of Transportation
VEGIS	Virginia Environmental Geographic Information Systems
VMRC	Virginia Marines Resources Commission
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
VOF	Virginia Outdoors Foundation
VRE	Virginia Railway Express

WHS Washington Headquarters Service

CHAPTER 1.0 PURPOSE AND NEED

The Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration (FHWA), has initiated a study for the Interstate 395 (I-395) Express Lanes Project (Northern High Occupancy Toll [HOT] Lanes) to extend the I-95 Express Lanes in the City of Alexandria, and Arlington and Fairfax Counties, Virginia. Pursuant to the National Environmental Policy Act of 1969, as amended (NEPA), and in accordance with FHWA regulations¹, this Environmental Assessment (EA) has been prepared to analyze and document the potential social, economic, and environmental effects associated with the proposed transportation improvements.

1.1 DESCRIPTION OF THE STUDY AREA

The study area encompasses approximately eight miles of the I-395 corridor from Turkeycock Run in Fairfax County to the vicinity of Eads Street near the Pentagon in Arlington County, as shown in **Figure 1-1**. Transition areas extending slightly beyond these termini are included in order to connect the proposed improvements with the existing facility on either end. Additional signage, maintenance of traffic, and noise barrier activities are anticipated to occur beyond the study area. Crossroads and interchange areas also are included in the study area, as well as lands adjacent to the corridor^{2,3}. The following interchanges along I-395 are included in the study area, moving south to north:

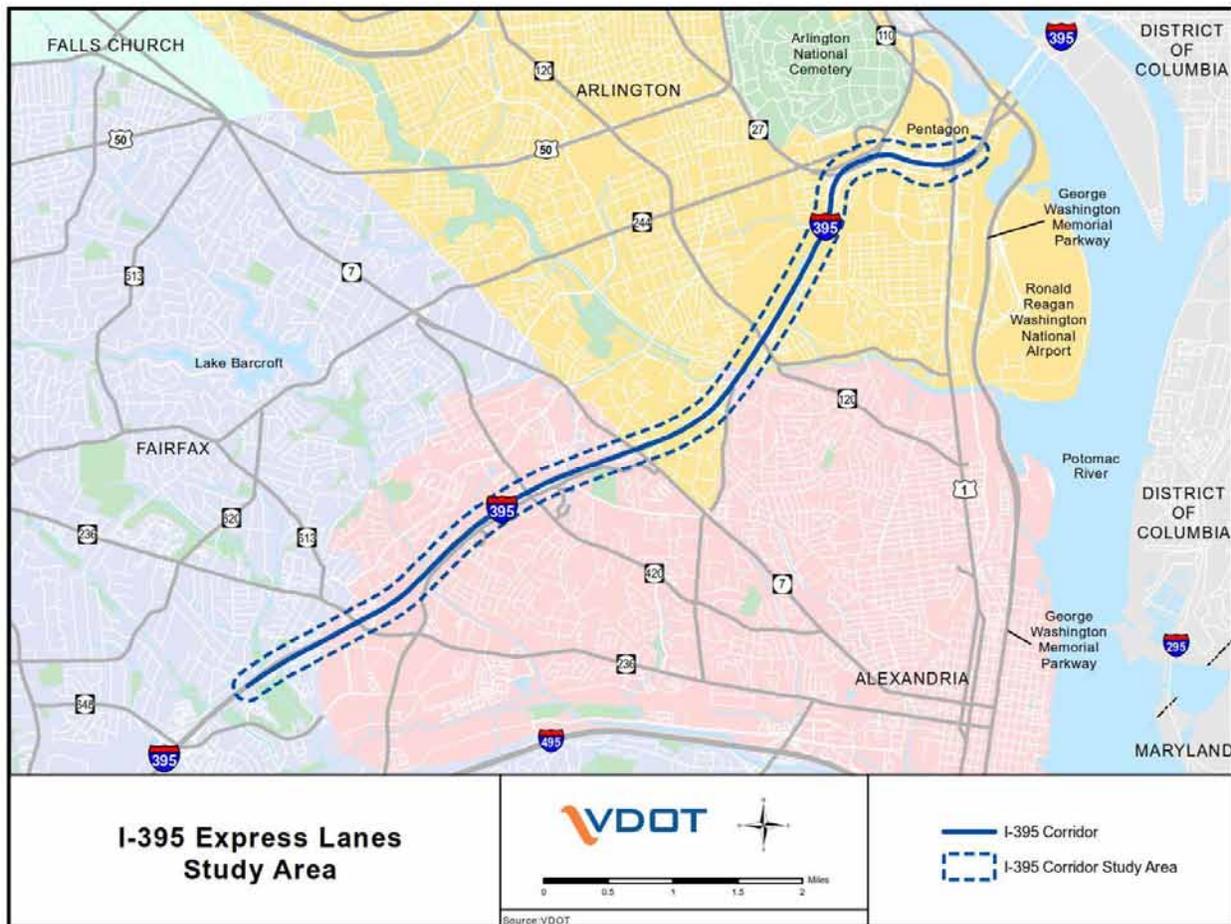
- Turkeycock Run;
- Duke Street/Little River Turnpike (Route 236);
- Seminary Road (Route 420);
- King Street (Route 7);
- Shirlington Road;
- Glebe Road (Route 120);
- Washington Boulevard (Route 27); and
- Eads Street near the Pentagon.

¹ NEPA and FHWA's regulations for Environmental Impact and Related Procedures can be found at 42 USC § 4332(c), as amended, and 23 CFR § 771, respectively.

² The study area is approximately 600 feet to either side of the existing corridor for a distance of eight miles. The study area was established to identify the full extent of environmental resources and their relevance to the project. Specific potential environmental consequences resulting from the expansion and conversion of the two existing reversible High Occupancy Vehicle (HOV) lanes on I-395 to three managed HOT lanes are documented in **Chapter 3.0, Environmental Consequences**.

³ The traffic analysis study area encompasses approximately ten miles of existing I-395 from south of the Edsall Road Interchange to the 12th Street Expressway in Washington, D.C. which is located just north of the entry and exit points of the existing HOV facility along I-395. The study area along the roadways with access to and from I-395 generally includes one major signalized intersection on either side of the interstate and all general purpose and HOV ramps serving I-395. See the *Traffic and Transportation Technical Report* (VDOT, 2016j) for additional details.

Figure 1-1: Study Area



1.2 INTERSTATE 395 CORRIDOR BACKGROUND AND STUDY HISTORY

The I-395 corridor begins at the I-95 / I-495 Capital Beltway Interchange and ends at New York Avenue NW (Route 50) intersection in northwest Washington, D.C., an approximate distance of 14 miles. I-395 is part of the National Highway System (NHS)⁴ and the Strategic Highway Network (STRAHNET)⁵.

The existing I-395 facility within the study limits generally includes four northbound and four southbound general purpose lanes and two reversible High Occupancy Vehicle (HOV) lanes between the northbound and southbound general purpose lanes. The HOV lanes operate in the northbound direction between 2:30 AM and 11:00 AM with HOV 3+ restrictions in effect from 6:00 AM to 9:00 AM. The HOV lanes operate in the southbound direction from 1:00 PM to 12:00 AM with HOV 3+ restrictions in effect from 3:30 PM to 6:00 PM.

⁴ NHS consists of major roadways important to the nation's economy, defense, and mobility. The NHS includes the interstate highway system as well as other roads connecting to major ports, airports, public transportation facilities, or other intermodal transportation services.

⁵ STRAHNET is a system of highways important to the United States' strategic defense policy providing defense access, continuity and emergency capabilities for defense purposes.

In 1995, the Public-Private Transportation Act (PPTA) was signed into law and was amended and re-enacted in 2005. PPTA allows for private entities to solicit VDOT to develop and/or operate and maintain transportation facilities that VDOT determines demonstrate a need. In November 2005, the conceptual proposal submitted by Fluor and Transurban was selected by the PPTA Advisory Panel. As proposed at that time, the project improvements would expand the HOV system in the I-95 / I-395 corridor and apply the HOT concept. As a result of this action, VDOT, in cooperation with FHWA, initiated an environmental analysis on the following proposal:

- Convert the existing two-lane HOV facility to three HOT lanes along I-395 from Eads Street to just south of Route 234 Interchange near Dumfries;
- Construct two new HOT lanes in the median from the existing terminus south of Route 234 to just north of Route 610 (Garrisonville Road);
- Add new entry/exit points between the general purpose lanes and the HOT lanes and modify existing entry/exit points; and
- Build new structures associated with the Lorton Bus-rail transfer station, flyovers, and replace existing structures at Telegraph Road over I-95 and the Franconia-Springfield pedestrian bridge.

In January 2009, FHWA issued a Categorical Exclusion (CE) for the project. In February 2011, VDOT reduced the project scope by eliminating approximately six miles of HOT lanes on I-395 including modifications to the existing interchanges, instead, focusing traffic improvements on the I-95 corridor. VDOT then announced plans for a new I-95 HOT Lanes Project and prepared an EA and then a Revised EA to assess HOT lanes on I-95 from Garrisonville Road in Stafford County to I-395 at Edsall Road in Fairfax County and link those lanes directly to the new I-495 HOT Lanes already under construction. In December 2011, upon review of the Revised EA and supporting documentation, FHWA issued a Finding of No Significant Impact (FONSI).

In 2012, VDOT and 95 Express Lanes, LLC (95 Express) entered into a Comprehensive Agreement for the development of the I-95 Express Lanes. The I-95 Express Lanes Project was completed in December 2014. The Comprehensive Agreement allows for the future development of the extension of the I-95 Express Lanes along the I-395 corridor similar to the limits originally proposed in 2005. In 2015, VDOT signed a Development Framework Agreement (see **Appendix C: Framework Agreement**) with 95 Express to extend the I-395 Express Lanes as a Concessionaire's Enhancement under the Comprehensive Agreement. The Development Framework Agreement outlines the responsibilities of both VDOT and the Concessionaire. The Agreement notes that improvements would be built largely within VDOT's existing right of way, VDOT and 95 Express would work together to finalize the scope, finance plan and agreement, and 95 Express would fund an annual transit payment.

Specific VDOT Comprehensive Agreement responsibilities include:

- Planning/environmental approvals⁶
 - Project inclusion in Metropolitan Washington Council of Governments (MWCOG) Transportation Planning Board's Financially Constrained Long-Range Plan and Transportation Improvement Plan
 - Public outreach

⁶ The EA and supporting technical documentation currently being prepared is taking an objective and independent look at the potential impacts of the proposed improvements to the human and natural environments within the identified study area.

- EA and supporting technical studies
- Preliminary noise barrier work
- Preparation and approval of an Interchange Modification Report (IMR)
- Federal, state and local agency coordination
- Transit / Transportation Demand Management (TDM) study (conducted by the Department of Rail and Public Transportation [DRPT]).

Specific 95 Express Comprehensive Agreement responsibilities include:

- Preliminary engineering and design
- Cost estimating
- Finance plan
- Design-build procurement
- Community outreach
- Construction and operation of the I-395 Express Lanes

1.2.1 Previous Studies and Related Projects

As an essential roadway facility serving the Washington Metropolitan region, the I-395 corridor has been the subject of a number of transportation studies over the past several years. These studies include:

Background Studies

- **moveDC:** Completed in 2014, moveDC is the Multimodal-Long Range Transportation Plan for Washington, D.C. The plan evaluated the current and future needs of, and provided recommendations for all modes of transportation: walking, bicycling, transit, rail, and vehicles within Washington, D.C. A key recommendation of the Plan is to manage capacity on major commuting routes by implementing HOV and / or HOT lanes within Washington, D.C. Specifically, the Plan identified I-395 on the 14th Street Bridge along with I-395 / I-695 between the 11th and 14th Street bridges for these improvements.
- **I-95 / I-395 Transit / TDM Study Final Report:** Completed in 2008, this study assessed effective ways to improve and invest in transportation improvements within the I-95 / I-395 corridor. This study considered potential funding availability from the I-95 / I-395 HOV / Bus / HOT Lanes project for transit and TDM initiatives.
- **I-95 / I-395 Bus Rapid Transit (BRT):** Completed in 2010, this study followed the 2008 I-95 / I-395 Transit / TDM Study. The I-95 / I-395 BRT study provided more detail on potential BRT infrastructure that would be needed to support a BRT system. The I-95 / I-395 HOT lanes were considered in the I-95 / I-395 BRT study as the HOT lanes could impact the BRT system by providing a potential funding source and by providing consistent and reliable travel times.
- **14th Street Bridge Corridor Draft Environmental Impact Statement (Draft EIS):** Eastern Federal Lands Highway Division (EFLHD) of FHWA conducted a Draft EIS to reduce congestion, enhance safety and improve traffic operations in the 14th Street Bridge Corridor which is located at the northern terminus of the I-395 Express Lanes Project and extends from Eads Street in Arlington County to east of the Southeast Freeway in Washington, D.C. The study identified several highway, transit, bicycle/pedestrian, and management alternatives to be retained for further study in the Final EIS. The Draft EIS was completed in January 2012. To date, the Final EIS has not been initiated.

Recently Completed Projects

- **I-95 HOT Lanes Project:** Involved construction of HOT lanes on I-95 from Garrisonville Road in Stafford County to I-395 at Edsall Road in Fairfax County. An EA and FONSI was approved by FHWA in 2011 and the HOT lanes were opened to traffic in December 2014.
- **I-395 Auxiliary Lane Project:** Involved the construction of one additional northbound auxiliary lane on I-395 connecting the northbound on-ramp at Duke Street to the northbound off-ramp at Seminary Road. A CE was completed in 2012. The project was completed in February 2015.
- **I-395 HOV / Transit Ramp at Seminary Road Project:** Involved the construction of a south-facing ramp between the I-395 HOV lanes and the third level of the Seminary Road Interchange that provides access for HOV and transit vehicles along I-395 to the south of the interchange. The HOV ramp is reversible and permits northbound traffic to exit to Seminary Road in the morning hours and permits traffic from Seminary Road to access the southbound I-395 HOV lanes in the afternoon and evening hours. An EA was approved in 2011 and a FONSI was issued by FHWA in 2012. The ramp was opened to traffic in January 2016.

Ongoing Projects / Studies

- **Boundary Channel Drive Interchange Project:** Includes interchange modifications to improve operations and reduce weaving along southbound I-395 including constructing two roundabouts, providing connections to Long Bridge Drive and US Route 1, and multi-modal improvements. The Boundary Channel Drive improvements were identified as an alternative as part of the 14th Street Bridge Corridor Draft EIS.
- **I-395 4th Lane South Widening:** Involves the construction of a fourth lane along southbound I-395 to provide one additional through lane from north of Duke Street to south of Edsall Road. Work would include interchange modifications at both Edsall Road and Duke Street to accommodate the additional through lane and to reduce weaving issues along southbound I-395. At the Duke Street / Little River Turnpike Interchange, the loop ramp serving southbound I-395 to eastbound Duke Street traffic would be removed and replaced with a traffic signal. At the Edsall Road Interchange, the loop ramp serving westbound Edsall Road to southbound I-395 traffic would be removed and replaced with a traffic signal. VDOT is preparing a CE to comply with NEPA. The CE is scheduled to be completed in the Fall of 2016. The project is currently in design and VDOT plans for the project to be constructed concurrently with the I-395 Express Lanes Northern Extension project.
- **Pentagon Reservation Master Plan Update:** The Pentagon Reservation Master Plan Update was completed in April 2015 and provides a long-term vision for the Pentagon Reservation to improve security, enhance the quality of life for employees, and address accommodations for visitors to the Pentagon. The Plan includes specific projects to be implemented over a twenty-year timeframe including substantial improvements to the South Parking Lot in the vicinity of the Eads Street Interchange. The exact timing of the implementation of the proposed South Parking Lot Improvements is not known at this time and is dependent on federal approvals and funding availability.
- **I-95 / I-395 Transit / TDM Plan (Plan):** DRPT initiated the development of the Plan in April 2016. VDOT and DRPT are preparing a Plan to identify and prioritize mobility improvements along the I-95 / I-395 Corridor. The I-95 / I-395 Transit / TDM Plan would be used to establish a

blueprint for a set of comprehensive transit and TDM investments to be implemented in the corridor. DRPT is evaluating a number of transportation improvements that would take advantage of the Express Lanes and increase mobility in the corridor while providing alternatives to driving alone. These potential investments, to be funded by the annual transit payment from the I-395 Express Lanes Northern Extension Project, include various modes of public transportation, park & ride facilities, TDM programs and other technologies. The Plan is scheduled to be completed in December 2016.

- **Arlington National Cemetery Southern Expansion Project and Associated Roadway Realignment:** The project includes modifications to the Washington Boulevard at Columbia Pike (East) Interchange and the realignment of Columbia Pike from S. Joyce Street to the west to increase the contiguous acreage of Arlington National Cemetery. The interchange modifications include the removal of the northwest and southwest loop ramps and converting the interchange to a partial diamond configuration. Southbound Washington Boulevard would access Columbia Pike at a new signalized intersection and access from Columbia Pike to southbound Washington Boulevard would also be provided at the new signal. Arlington National Cemetery, the lead agency for the project, has been working with Arlington County and VDOT to pursue the roadway modifications and land exchange agreement. The U.S. Army Corps of Engineers is preparing an EA for the project.

1.3 NEEDS FOR THE PROJECT

Based on the background information discussed above, information gathered during public and agency meetings, and the analysis of recent data collected for this study, the following transportation needs have been identified for the study area.

- Reduce congestion;
- Provide additional travel choices;
- Improve travel reliability; and
- Improve roadway safety.

Each of these key needs is described in detail below.

1.3.1 Reduce Congestion

The I-395 corridor suffers from recurring congestion during peak commuter periods that extends for several hours during the morning and evening peak periods. The predominant travel direction in the AM peak period is northbound on I-395 toward Washington, D.C. and southbound toward Stafford County during the PM peak period. The *Traffic and Transportation Technical Report* (VDOT, 2016j) further documents traffic conditions for existing (2015) and future 2040 No Build conditions in more detail including a summary of the forecasting and traffic analysis methodology.

Traffic Volumes

Existing (2015) and 2040 No Build peak hour traffic volumes for northbound and southbound I-395 for both the general purpose and HOV/HOT lanes are summarized in **Figures 1-2 and 1-3**, respectively.

Northbound I-395 – AM Peak Hour: Under existing conditions, northbound AM peak hour traffic volumes in the I-395 general purpose lanes gradually increase from 4,200 to 8,300 between Edsall Road and Glebe Road. The traffic volumes reduce to 5,500 over the Hayes Street Bridge due to the large amount of vehicles exiting the corridor and traveling to Washington Boulevard, Army Navy Drive, and other destinations in the Pentagon vicinity. General purpose traffic volumes increase to 7,600 over the Potomac River due to the traffic entering the corridor at George Washington Memorial Parkway. In the HOV/HOT lanes, traffic volumes decrease from 3,900 vehicles north of Edsall Road to 2,900 vehicles north of Turkeycock Run due to vehicles traveling from the HOT lanes to the general purpose lanes during the HOV-restricted period. Similar to the general purpose lanes, traffic volumes in the HOV lanes decrease to 2,400 over the Hayes Street Bridge due to the traffic exiting the corridor to Washington Boulevard. At the Potomac River, the HOV volumes increase to 3,500 vehicles due to the traffic entering the HOV lanes from Eads Street and north of Eads Street (from the general purpose lanes) and traveling into Washington, D.C.

Southbound I-395 – PM Peak Hour: In the southbound general purpose lanes, PM peak hour traffic volumes of 5,900 leaving Washington, D.C. decrease at the Hayes Street Bridge due to the traffic exiting the corridor at Route 1 and George Washington Memorial Parkway. PM peak hour volumes then gradually increase from 3,700 over the Hayes Street Bridge to 6,700 at Shirlington Road due to the traffic entering the corridor at Washington Boulevard and Glebe Road. The general purpose lane volumes then stay relatively constant between Shirlington Road and Edsall Road averaging approximately 5,900 vehicles. Traffic volumes in the southbound HOV lanes leaving Washington, D.C. are approximately 3,700 vehicles and decrease to 1,800 vehicles north of Route 1 due to traffic traveling from the HOV lanes to the general purpose lanes during the HOV-restricted period. Traffic volumes in the HOV lanes then gradually increase to 3,100 north of Shirlington Road due to traffic entering the corridor from Eads Street and Washington Boulevard. Traffic then remains relatively constant until south of Turkeycock Run where the HOT lanes begin and the volumes increase from 2,700 to 3,100 due to single occupancy vehicles being permitted to travel in the HOT lanes.

To provide consistency with the regional planning efforts, the MWCOG Travel Demand Forecasting Model, Version 2.3 Build 57a was used as the basis for the development of traffic forecasts. The forecasting methodology was consistent with FHWA's Interim Guidance on the Application of Travel and Land Use Forecasting in NEPA publication (USDOT FHWA, 2010). As shown in **Figures 1-2 and 1-3**, peak hour traffic volumes are forecasted to increase in the future which will lead to more severe and a longer duration of congestion during both the AM and PM peak periods as discussed below.

Figure 1-2: Existing (2015) and 2040 No Build AM Peak Hour – Northbound I-395

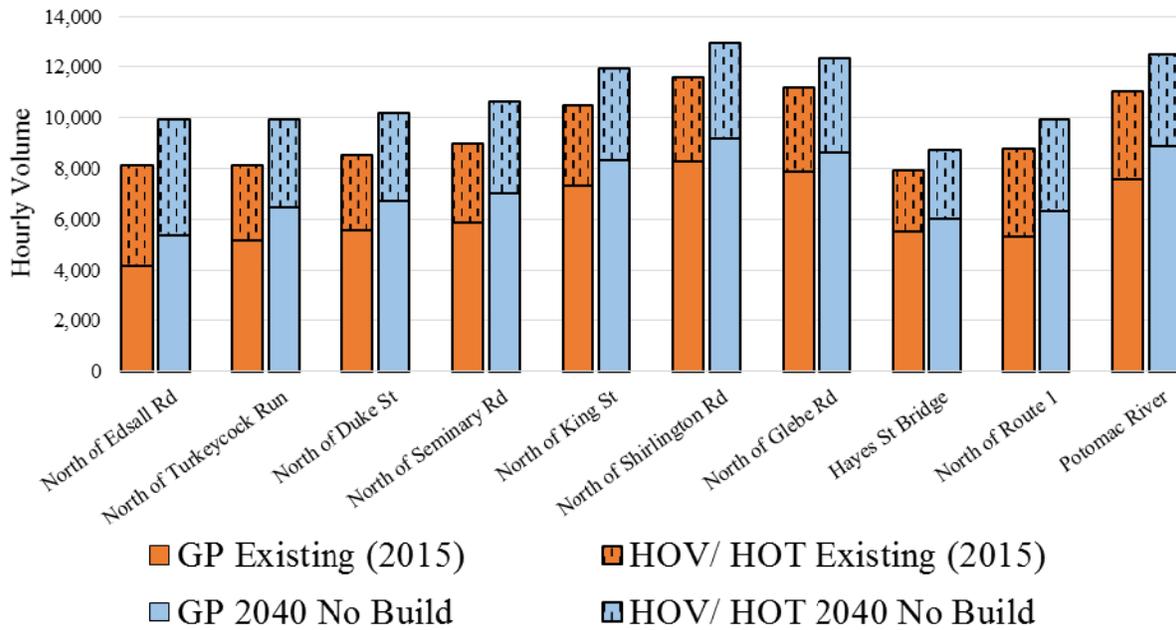
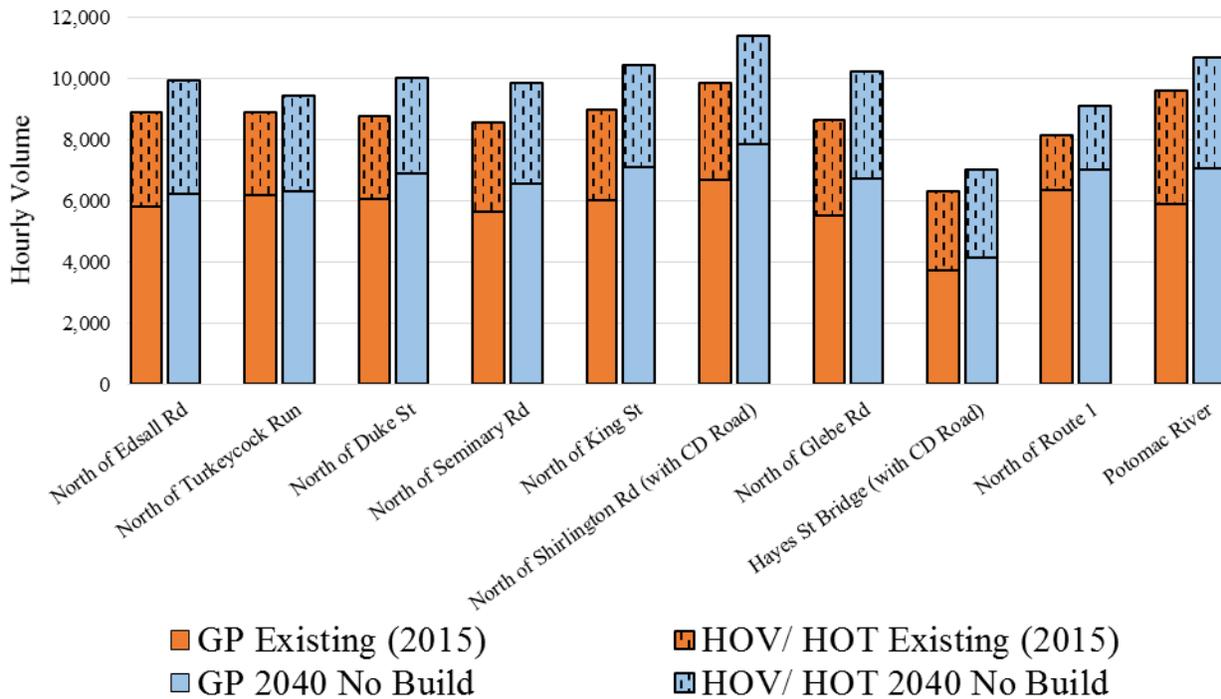


Figure 1-3: Existing (2015) and 2040 No Build PM Peak Hour – Southbound I-395



Travel Times and Speeds

As described in the *Traffic and Transportation Technical Report* (VDOT, 2016j), a VISSIM mesoscopic model was prepared for both existing (2015) and 2040 No Build conditions to assess traffic operations along I-395 from south of Edsall Road to the 12th Street Expressway in Washington, D.C. in both the general purpose and HOV/HOT lanes. Due to over-capacity conditions along I-395 that are experienced for several hours during the morning and evening peak periods, the AM peak period was evaluated for four hours from 6:00 AM to 10:00 AM and the PM peak period was evaluated for four hours from 3:00 PM to 7:00 PM. A comparison of travel times along I-395 for existing and 2040 No Build conditions is summarized in **Figures 1-4 and 1-5** for the peak travel direction (northbound in the AM peak period and southbound in the PM peak period) for each of the four analysis hours. **Figures 1-6 and 1-7** summarize the travel speeds by segment along I-395 for existing conditions and No Build conditions for the northbound I-395 and southbound I-395 travel directions, respectively.

AM Peak Period – Northbound General Purpose Lanes: Existing travel times along the northbound I-395 general purpose lanes for the four hours during the AM peak period range from 19 to 31 minutes with average travel speeds ranging from 20 to 34 MPH, respectively, reflecting high levels of congestion during the four-hour peak period. The 7 AM to 8 AM hour has the longest travel time (31 minutes) among the four AM peak hours due to higher congestion levels and lower speeds during this hour between Edsall Road and King Street.

Under 2040 No Build conditions, travel times along the northbound I-395 general purpose lanes increase by 10 to 19 minutes compared to existing conditions in the AM peak period. A large portion of the travel time increase occurs south of the Turkeycock Run Interchange as a result of the congestion and queuing along northbound I-395 extending farther to the south during peak hours.

AM Peak Period – Northbound HOV/HOT Lanes: Existing travel times along the northbound I-395 HOV/HOT lanes range from 10 to 12 minutes with average travel speeds of 51 to 58 MPH. Travel times in the northbound HOV/HOT lanes are two to three times shorter than travel times in the northbound general purpose lanes. Travel speeds in the HOV/HOT lanes generally operate under free-flow conditions south of the Eads Street Interchange area; however, outside of the designated HOV periods northbound motorists in the HOV lanes experience congestion and lower travel speeds due to downstream congestion approaching Washington, D.C., that occasionally extends farther to the south due to the use of the HOV lanes by single occupant vehicles.

Under 2040 No Build conditions, travel times from 6 AM to 7 AM remain approximately the same in the northbound HOV/HOT lanes when comparing existing to No Build conditions. From 7 AM to 10 AM, travel times increase by 1.5 to 5 minutes. Travel times increase south of Turkeycock Run as northbound motorists in the HOT lanes attempt to exit to the general purpose lanes at Turkeycock Run and encounter greater congestion in the general purpose lanes compared to existing conditions. Travel times also increase between Eads Street and 14th Street in Washington, D.C. as a result of higher traffic volumes and congestion levels in this section where the HOV lanes are open to travel by all motorists.

PM Peak Period – Southbound General Purpose Lanes: Existing travel times along the southbound I-395 general purpose lanes range from 27 to 42 minutes with average travel speeds of 14 to 22 MPH. Travel times from 4 PM to 6 PM hour are the greatest with an average of 40 minutes.

Under 2040 No Build conditions, travel times along the southbound I-395 general purpose lanes increase by 10 to 19 minutes compared to existing conditions with the largest increases of 18 to 19 minutes occurring between 5 PM and 7 PM. Travel times increase incrementally throughout the study limits, with the largest travel time increases occurring north of Shirlington Road. As a result of the I-395 4th Lane South Widening project which is included in the No Build Alternative (see **Section 2.3.1**), travel speeds increase approaching and south of the Duke Street Interchange.

PM Peak Period – Southbound HOV/HOT Lanes: Existing travel times along the southbound I-395 HOV/HOT lanes are approximately 10 minutes with average travel speeds of 57 MPH. Travel times in the southbound HOV/HOT lanes are three to four times shorter than travel times in the southbound general purpose lanes.

Under 2040 No Build conditions, travel times from 3 PM to 7 PM remain approximately the same in the southbound HOV/HOT lanes when comparing existing to No Build conditions.

Figure 1-4: Northbound Overall Travel Time Summary - AM Peak Period

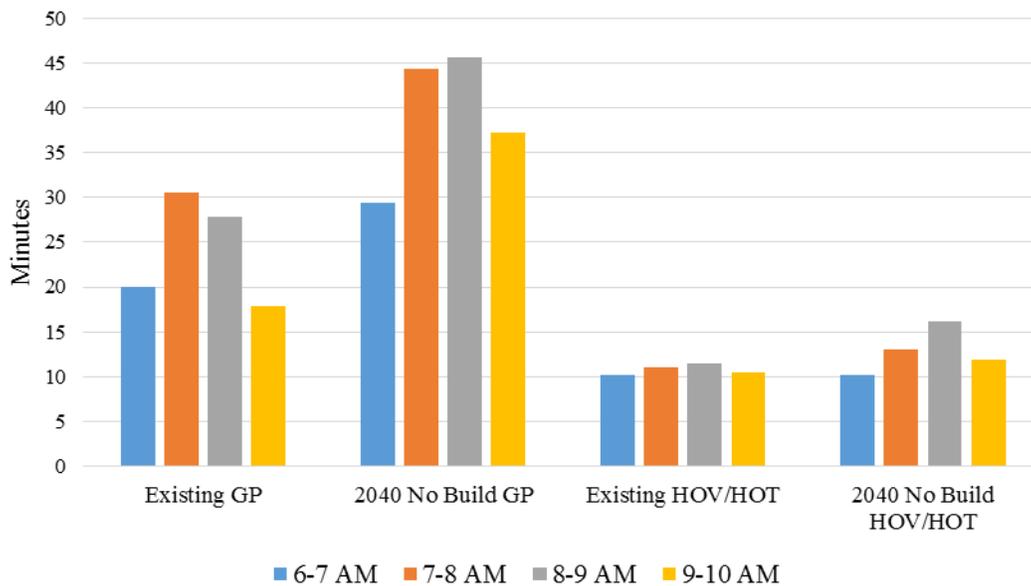


Figure 1-5: Southbound Overall Travel Time Summary - PM Peak Period

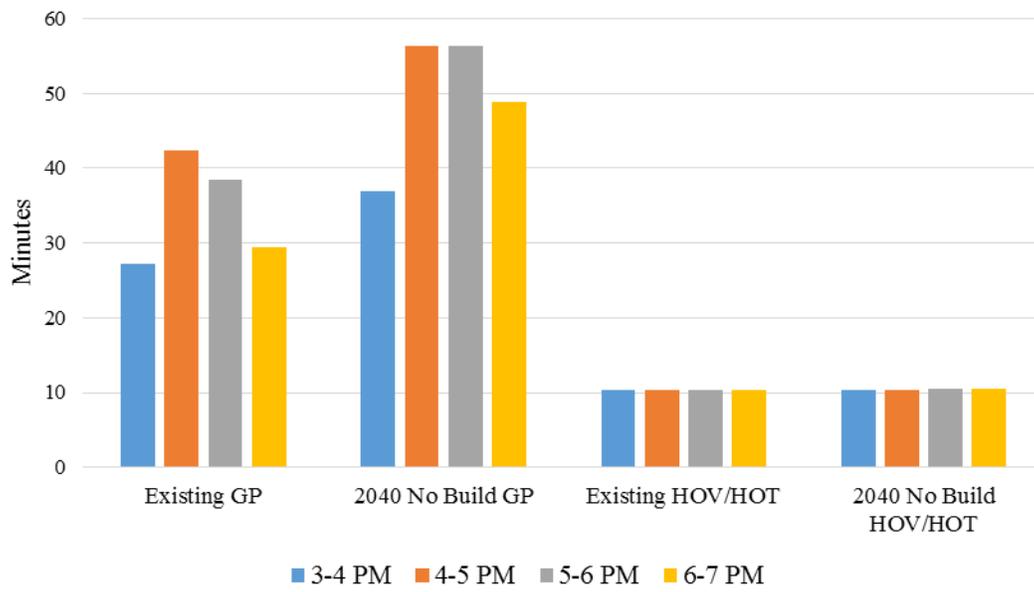


Figure 1-6: AM Peak Period Travel Speeds – Northbound I-395

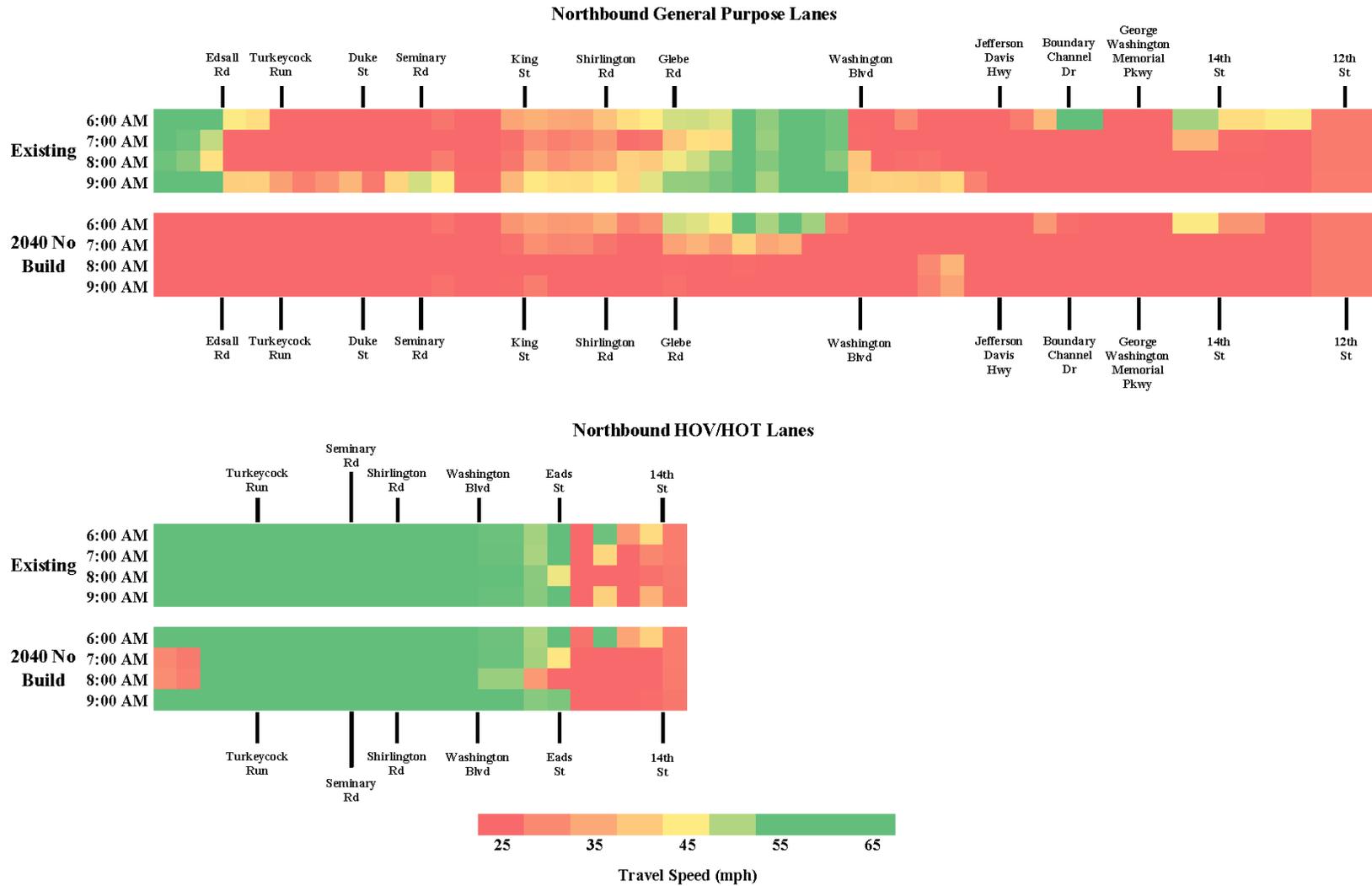
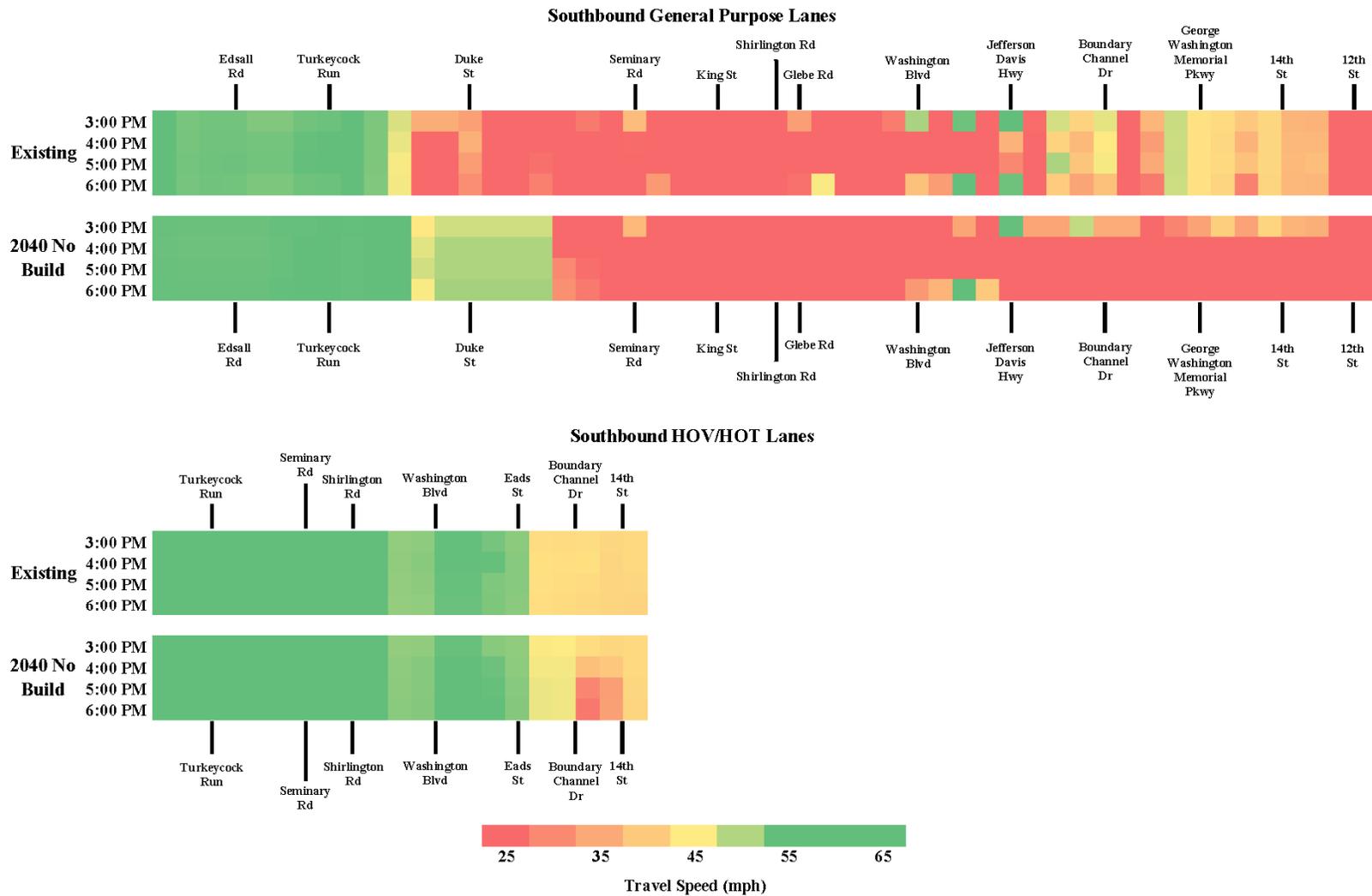


Figure 1-7: PM Peak Period Travel Speeds – Southbound I-395



1.3.2 Provide Additional Travel Choices

I-395 is a multi-modal corridor that provides transportation services to a variety of users between Stafford County and Washington, D.C., in addition to regional travelers. The corridor provides access to the Pentagon which is a regional transit hub that serves the Metro system's Yellow and Blue lines, local and regional commuter buses, formal ridesharing, and informal ridesharing (also known as slugging). Slugging is an important component of travel in the I-395 corridor, which is a form of carpooling from designated pickup and drop off points located in close proximity to an HOV facility. The incentive to the driver and the passenger is the ability to use the HOV facility. Because of the proximity of the Pentagon Reservation and the Pentagon Transit Center (PTC) to the I-395 corridor, the Pentagon Reservation functions as a regional transit hub providing a linkage for commuters. The PTC accommodates eight transit bus services with nearly 850 buses per day and approximately 160 buses in the AM and PM peak hours. Over 19,000 bus passengers travel through the PTC daily from 6 AM to 9 AM and from 3 PM to 6 PM with over 5,600 peak period passengers using the Pentagon Metrorail Station (Washington Headquarters Service, 2015). The I-395 corridor also serves many commuter and local bus lines serving local communities in northern Virginia and Washington, D.C. These transit services suffer from the same congestion deficiencies as other transportation users along the I-395 corridor. Additionally, another travel option is available on the Virginia Railway Express (VRE) Fredericksburg Line, a commuter rail service line that parallels the I-395 corridor and extends from Spotsylvania County to Union Station in Washington, D.C.

In addition, the existing Express Lanes network is critical because the network provides additional travel choices for a variety of users including motorists along I-95 / I-395/ and I-495. Travel choice is limited for vehicles with less than three occupants that want to continue north along the I-95 / I-395 Express Lanes facility north of the Turkeycock Run Interchange where these vehicles are required to exit the HOT lanes and enter the general purpose lanes. Similarly, vehicles with less than three occupants traveling southbound along I-395 within the project limits do not have an option to access the Express Lanes system until south of Turkeycock Run.

1.3.3 Improve Travel Reliability

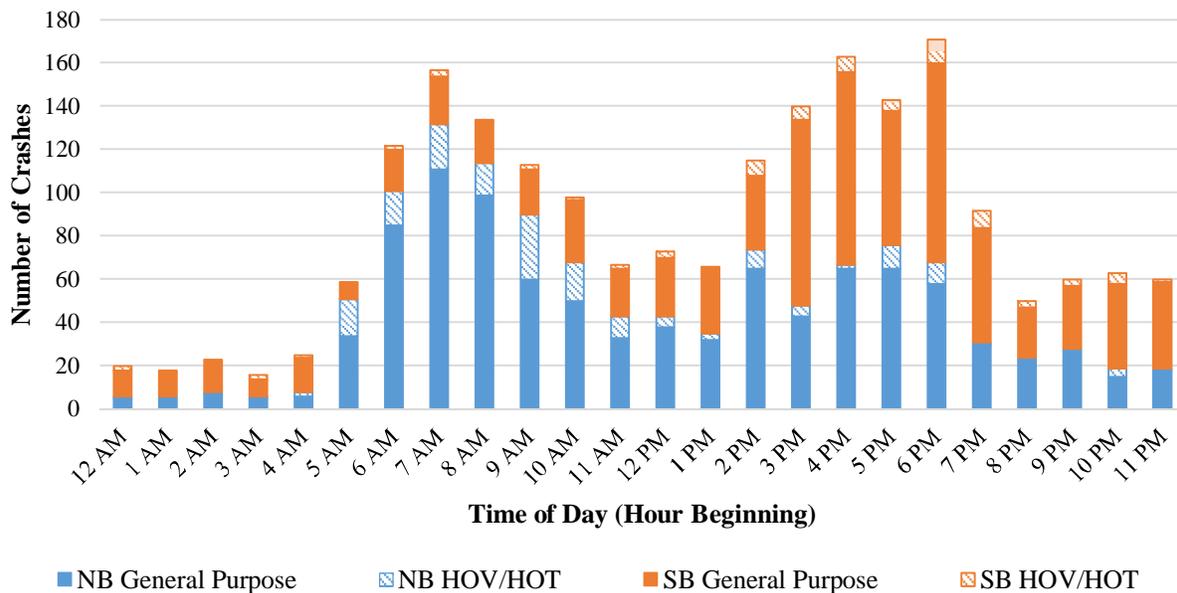
Travel time reliability is a quality of life issue for travelers along I-395 including HOV motorists and those using bus transit services along the corridor. Based on travel speed data in both the I-395 general purpose lanes and HOV lanes, highly variable travel speeds and resulting travel times are experienced by motorists as a result of numerous factors including both recurring and non-recurring congestion, crash incidents, disabled vehicles, and weather events. Although there is a higher degree of travel time reliability for transit riders and carpoolers in the HOV lanes relative to trips in the general purpose lanes, high levels of congestion and reduced travel speeds are experienced in the northbound HOV lanes in the AM peak period approaching the Eads Street Interchange and entering Washington, D.C. As discussed in **Section 1.3.1**, the duration and extent of congestion within the HOV lanes in this area is expected to increase in the future as traffic volumes increase. There is a need to provide highly reliable travel times for motorists and transit services along the I-395 corridor throughout the day.

1.3.4 Improve Roadway Safety

Recurring daily congestion due to heavy commuter traffic that extends for many hours during both the morning and evening peak periods creates the potential for crashes along the I-395 corridor in both the general purpose and HOV/HOT lanes. Crash data was reviewed along both the I-395 general purpose and

HOV/HOT lanes from approximately 0.45 mile south of Edsall Road to the Potomac River during the four-year period from January 1, 2012 through December 31, 2015. A total of 2,622 crashes were reported including 1,461 (56 percent) rear end crashes, which are frequently attributed to congestion. **Figure 1-8** summarizes weekday (Monday through Friday) crashes by time of day. Seventy-eight (78) percent of all reported crashes occurred on weekdays from Monday through Friday. As shown, 26 percent of all weekday crashes occurred during the AM peak period from 6:00 AM to 10:00 AM and 30 percent of all weekday crashes occurred during the PM peak period between 3:00 PM and 7:00 PM. Fifty-six (56) percent of all weekday crashes occurred during these eight hours indicating a higher proportion of crashes occurring when traffic volumes are highest and that congestion contributes to the potential for crashes.

Figure 1-8: Weekday (Monday – Friday) Crashes by Time of Day (2012 – 2015)



Crash rates per 100 million vehicle miles traveled for the northbound and southbound I-395 general purpose and HOV/HOT lanes are summarized in **Table 1-1** for both total crashes and injuries. Calculated crash rates were compared to VDOT’s annually-published statewide average interstate, statewide average urban interstate, and Northern Virginia average interstate rates for both total crashes and injuries.

The total crash rate in the northbound general purpose, southbound general purpose, and northbound HOV/HOT lanes is greater than the statewide average interstate crash rate, statewide average urban interstate crash rate, and Northern Virginia average crash rate. The total crash rate for the southbound HOV/HOT lanes is lower than all three average crash rates; however, crash rates ranging from 134 to 198 crashes per 100 million vehicle-miles traveled (VMT) were reported just south of the Eads Street Interchange in the vicinity of the weave between the on-ramp from Eads Street and the off-ramp to the general purpose lanes, which are greater than all three average crash rates. Of the 68 crashes reported within the southbound HOV lanes from Turkeycock Run to Eads Street, 21 (31 percent) crashes occurred at this location.

Under future No Build conditions, with anticipated increases in travel demand, congestion in the peak periods will increase, thereby increasing the potential for congestion-related crashes which account for the majority of reported crashes under existing conditions.

Table 1-1: Crash and Injury Rate (per 100 million VMT) Compared to Average Statewide Rates

Crash Rate Type	I-395 Crash Rates by Facility (2012 – 2015 Crashes)				Statewide Average Rates ¹		
	NB GP	NB HOV/ HOT	SB GP	SB HOV/ HOT	Interstate	Urban Interstate	Northern Virginia Interstate
Total Crash Rate²	119	109	113	39	68	81	97
Injury Rate³	29	44	37	39	30	37	41

¹ Average of the 2012, 2013, and 2014 crash rates published annually by VDOT's Traffic Engineering Division

² Crashes per 100 million vehicle miles traveled

³ Injuries per 100 million vehicle miles traveled

1.4 PURPOSE AND NEED SUMMARY

Based on the existing and future transportation conditions described above, the purpose and need of the project is to:

- Reduce congestion;
- Provide additional travel choices;
- Improve travel reliability; and
- Improve roadway safety.

CHAPTER 2.0 ALTERNATIVES

The process of developing alternatives to address the transportation needs along the Interstate 395 (I-395) corridor has been ongoing for several years as documented in the *Alternatives Analysis Technical Report* (VDOT, 2016a). This project was previously evaluated as part of a larger project that proposed establishing Express Lanes along the I-95 and I-395 corridors. The original plan was to connect the Express Lanes between I-395 (the Northern Section of the project) and I-95 (the Southern Section of the project) thereby reducing congestion and improving safety of the merging roadways. While Express Lanes were only constructed from Garrisonville Road in Stafford County to Edsall Road in Fairfax County, congestion north of the Express Lanes has continued to increase along I-395. Consultation among Virginia Department of Transportation (VDOT), Federal Highway Administration (FHWA), District of Columbia Department of Transportation (DDOT), Department of Defense (DoD), Resource Agencies, Local Governments, and Stakeholders has resulted in the decision to evaluate a project that would address the identified needs along the I-395 corridor.

2.1 ALTERNATIVES DEVELOPMENT

To address the identified purpose and need, converting the existing High Occupancy Vehicle (HOV) facility to a High Occupancy Toll (HOT) lanes system was the only build alternative evaluated in detail⁷. Since Express Lanes already exist within the median of I-95 from Garrisonville Road in Stafford County to I-395 at Edsall Road in Fairfax County, making the change from HOV to HOT within the median of I-395 would minimize and reduce impacts by not requiring future improvements to the existing general purpose travel lanes beyond what has already been planned regionally. Furthermore, an additional build alternative that did not involve the conversion of the HOV lanes to HOT lanes was not considered as the travel choices and reliability are dependent on connecting the existing HOV facility to the regional Express Lanes network. A No Build Alternative is described in **Section 2.3.1**.

2.2 ALTERNATIVES NOT RETAINED FOR DETAILED STUDY

As discussed above, only one proposed build alternative was evaluated in detail. No other alternatives were developed; therefore, no alternatives have been eliminated from detailed study.

2.3 ALTERNATIVES RETAINED FOR EVALUATION

2.3.1 No Build Alternative

In accordance with the regulations implementing the National Environmental Policy Act (NEPA) (40 CFR § 1502.14(d)), the No Build Alternative has been included for evaluation for the comparison of future conditions and impacts. The No Build Alternative would retain the existing two reversible HOV lanes, existing general purpose lane and associated interchanges in their current configuration, and allow for routine maintenance and safety upgrades. This alternative also assumes that the projects currently programmed and funded in VDOT's Fiscal Year (FY) 2016-2021 Six-Year Improvement Program (SYIP) and the Metropolitan Washington Council of Governments (MWCOG) Constrained Long-Range

⁷ Multiple options for the Eads Street Interchange were evaluated as indicated below in **Section 2.3.2.2**.

Transportation Plan (CLRP) for the National Capital Region would be implemented. The roadway and transit projects listed in the SYIP and MWCOG CLRP within the study area are shown in **Table 2-1**.

Table 2-1: No Build Projects within the I-395 Corridor

Project/Study	Description	Completion Date
I-395 HOV / Transit Ramp at Seminary Road ¹	Construction of a south-facing ramp from the HOV lanes to the top level of the Seminary Road Interchange that provides additional access for HOV and transit	Jan 2016
12th Street Extension ²	Construct 12 th Street between S. Eads Street and S. Fern Street	2016
I-395 4 th Lane South Widening – Duke Street to Edsall Road	Widening of southbound (SB) I-395 to provide one additional through lane from north of Duke Street to south of Edsall Road	2019
Seminary Road and Beauregard Street Ellipse	Modification of the intersection to an ellipse design to eliminate weaving issues on westbound Seminary Road and increase capacity	2020
Boundary Channel Drive Interchange	Interchange modifications to improve operations and reduce weaving along SB I-395 including constructing two roundabouts, providing connections to Long Bridge Park Drive and US Route 1, and multi-modal improvements	Summer 2021
Army Navy Drive Complete Streets ³	Multi-modal improvements along Army Navy Drive between South Joyce Street and 12 th Street including constructing a dedicated bicycle facility and improving transit accommodations	2021
Arlington National Cemetery Southern Expansion Project and Associated Roadway Realignment	Interchange improvements to remove the NW and SW ramps and conversion to a diamond configuration to increase the contiguous area of Arlington National Cemetery	TBD ⁴
Pentagon South Parking Lot Improvements	Reconfiguration of the South Parking Lot as part of the Pentagon Master Plan	TBD ⁵
Landmark Transit Center	Construction of a transit center as part of redevelopment of the Landmark Mall providing a waiting environment between two high-capacity transit lines serving Alexandria	TBD
West End Transitway Bus Rapid Transit (BRT) ⁶	Proposed transit line that will run along the Van Dorn/Beauregard corridor and connect with transit centers at the Van Dorn Street Metrorail station, Landmark Mall, Mark Center, Southern Towers, Shirlington, and Pentagon	2019
Crystal City Transitway: Northern Extension ⁶	Extension of existing Metroway BRT line from the Crystal City Metro Station north to the Pentagon City Metro Station	2023
Route 7 Transit Study from Tysons to Alexandria ⁷	Study to identify new transit options along Route 7. The BRT option would travel 11 miles along Route 7 with a majority in a dedicated lane between the Spring Hill Metrorail Station and the Mark Center	TBD

¹ Not included in base year conditions due to recent opening of the HOV ramp and adjustment period required for full utilization of the ramp.

² Not included in the CLRP, but currently under construction.

³ Not included in the CLRP; however, funding for the project was included in the approved Arlington County 2015-2024 CIP.

⁴ Sponsoring agencies are planning to incorporate this project into 2017 CLRP; anticipate completion between 2020 and 2040.

⁵ The South Parking Lot Improvements associated with the Pentagon Master Plan will be completed following construction of the interim improvements to the South Parking Lot that are incorporated into the I-395 Express Lanes Extension.

⁶ Listed in the 2016 CLRP Amendment

⁷ Not included in the CLRP; however, the study is funded by the Northern Virginia Transportation Authority (NVTA) and listed in the Fairfax County FY16-22 Transit Development Plan.

Ability of the No Build Alternative to Address the Purpose and Need

As discussed in **Section 1.3** and the *Traffic and Transportation Technical Report* (VDOT, 2016j), traffic volumes are forecasted to increase in the future which will lead to more severe and a longer duration of congestion along I-395 in both the general purpose and HOV lanes during both the AM and PM peak periods. Likewise, increased congestion will further deteriorate travel reliability along I-395. Travel choice will continue to remain limited for vehicles with less than three occupants that want to continue north along the I-95 / I-395 Express Lanes facility north of the Turkeycock Run Interchange where these vehicles are required to exit the HOT lanes and enter the general purpose lanes. Similarly, vehicles with less than three occupants traveling southbound along I-395 within the project limits do not have an option to access the Express Lanes system until south of Turkeycock Run. Under the No Build conditions, with anticipated increases in travel demand, congestion in the peak periods will increase, thereby increasing the potential for congestion-related crashes. Therefore, the No Build Alternative would not meet the purpose and need for the project.

2.3.2 Build Alternative

The Build Alternative, shown in **Figures 2-1** through **2-5**, converts the two existing reversible HOV lanes within the existing median along the I-395 corridor to three HOT lanes within the existing footprint of the HOV facility from the current I-395 HOT lanes terminus at Turkeycock Run to Eads Street near the Pentagon. The expansion of the existing system of reversible HOV lanes located in the median of I-395 is an extension of the existing I-95 Express Lanes (HOT) to the south. For the majority of the project, the existing reversible HOV lanes are separated from the general purpose lanes by guardrail barriers mounted on a 4 to 6-foot wide concrete island. The existing guardrail and the concrete island would be replaced with double face concrete barriers. The proposed concrete barriers would be installed generally with a 2-foot offset along the western edge of the existing concrete island (to be removed), which provides an additional 2-foot shoulder on the southbound general purpose lanes. The wider shoulder would improve the functionality of the inside shoulder of the southbound general purpose lanes. The remaining portion of the additional width gained from the removal of the concrete islands is allocated to the HOT facility to provide the space required for the three HOT lanes and shoulders. The existing and proposed typical sections are shown in **Figure 2-6**.

Figure 2-1: Build Alternative Section 1



Figure 2-2: Build Alternative Section 2



Figure 2-3: Build Alternative Section 3

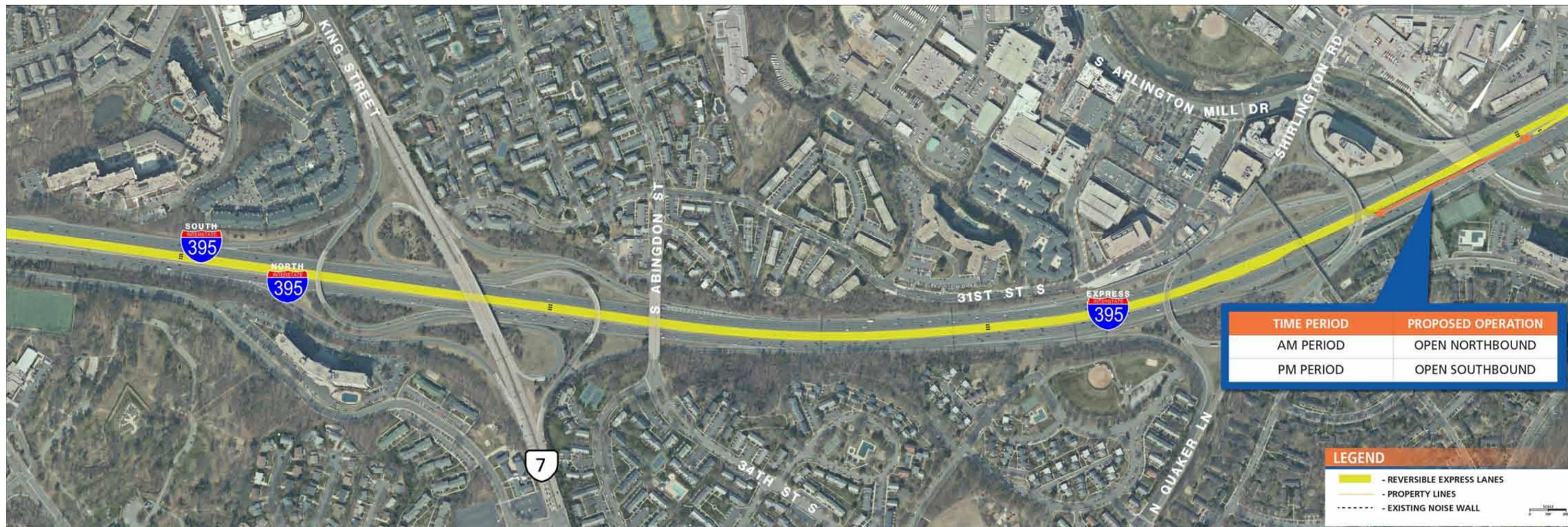


Figure 2-4: Build Alternative Section 4

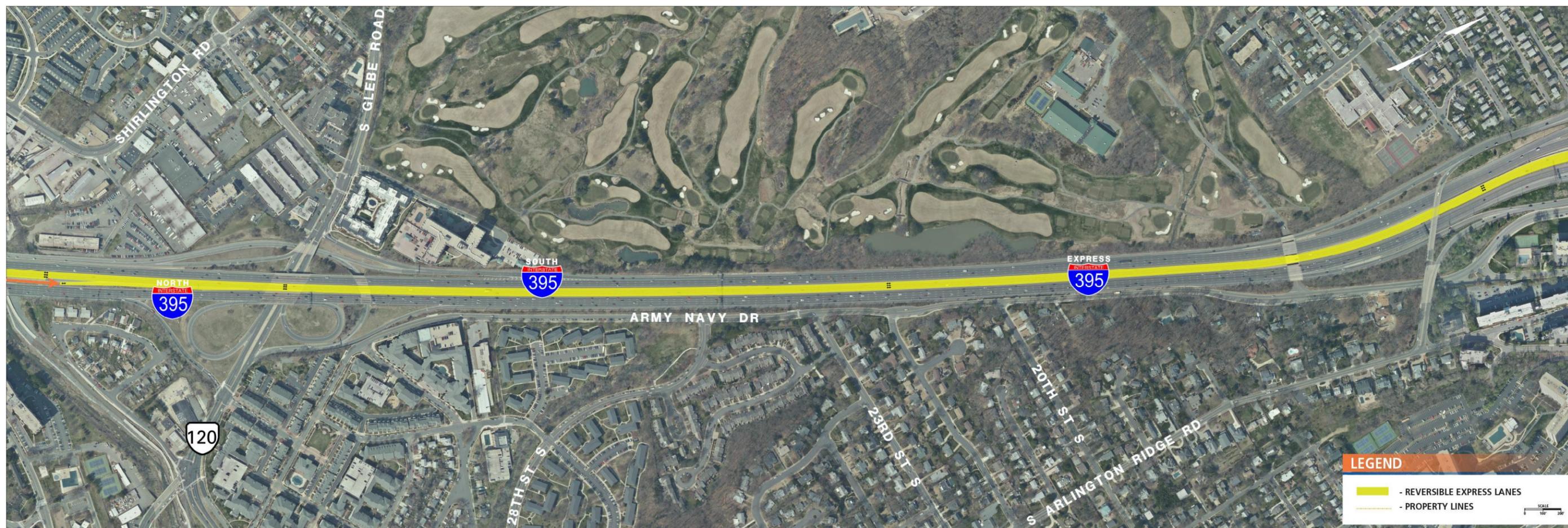


Figure 2-5: Build Alternative Section 5

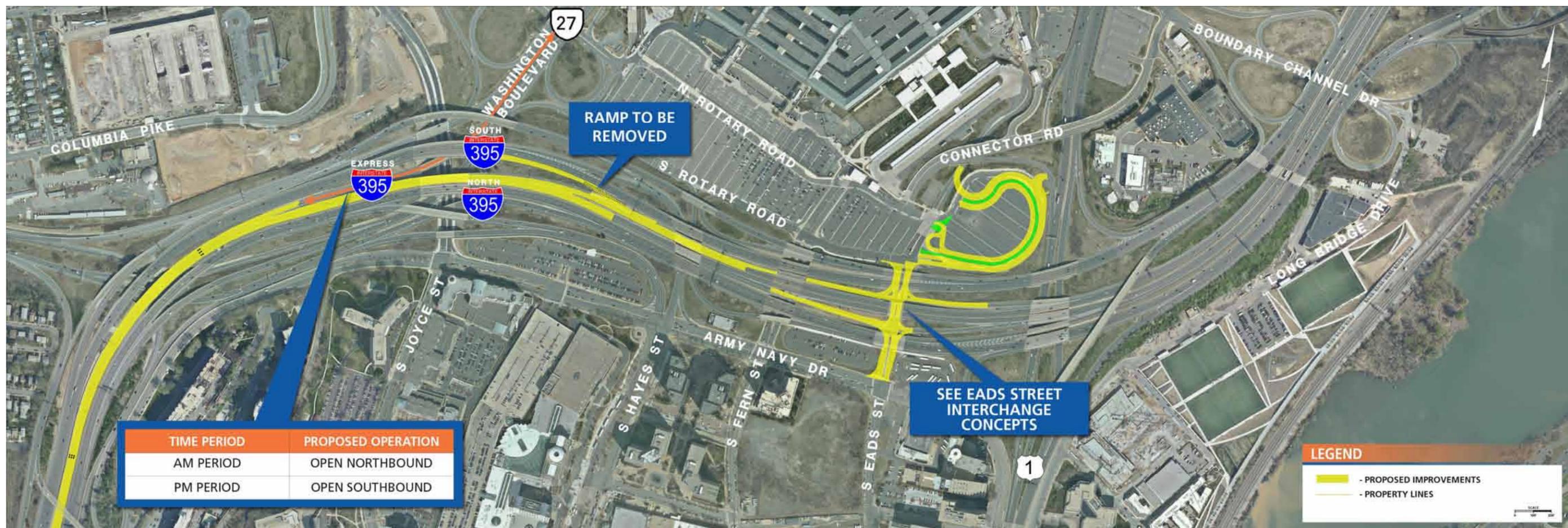
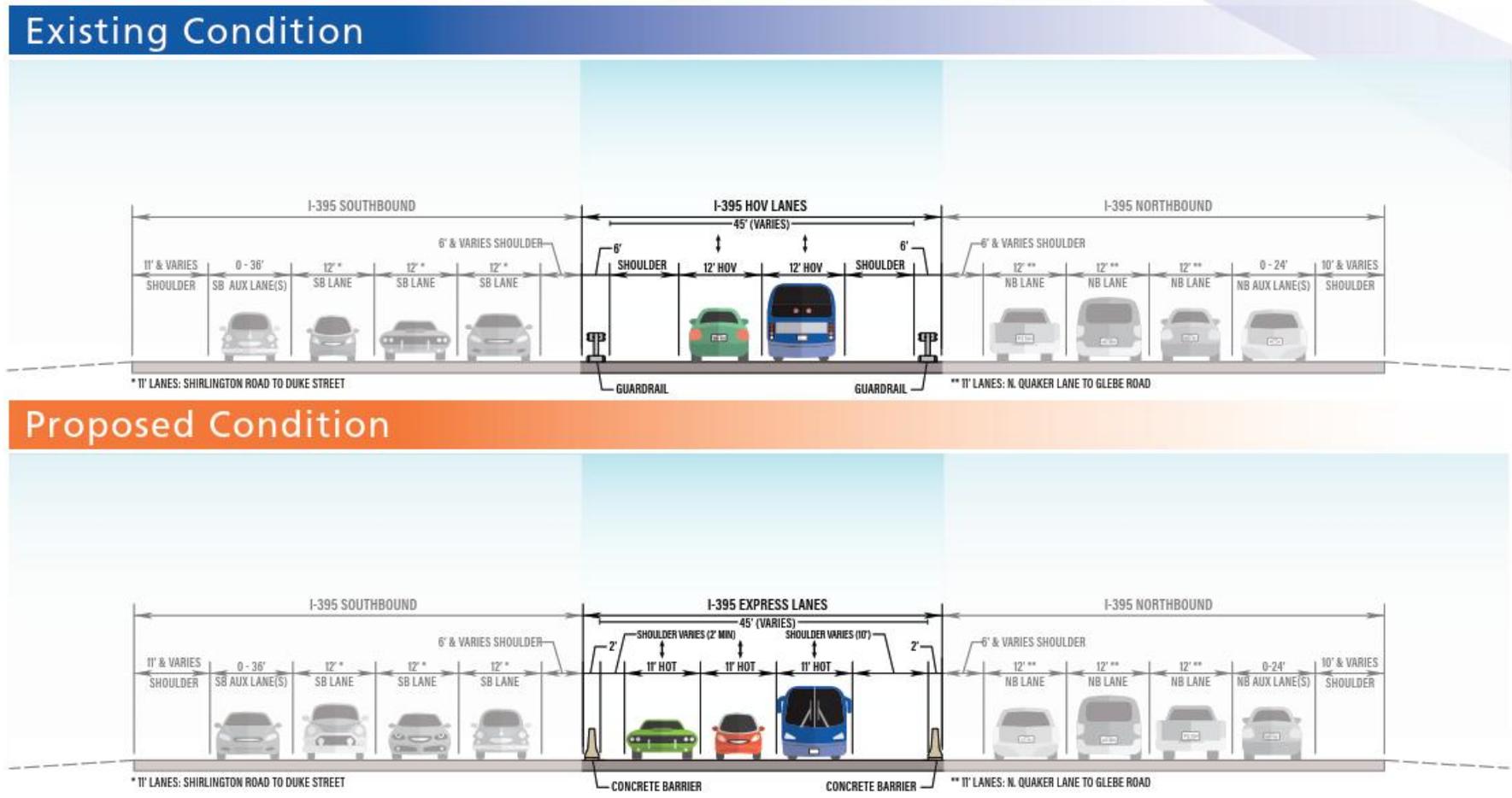


Figure 2-6: Existing and Proposed Typical Section



By maximizing the width between the general purpose lanes and reconstructing the existing paved shoulders, the proposed three HOT lanes would largely be accommodated within the footprint of the existing HOV facility with only minor impacts to the general purpose lane shoulders in the northern section on the southbound side. The available width for this HOT Lane facility is approximately 45 feet (variable), as shown in **Figure 2-6**. The typical section consists of three 11-foot wide travel lanes with a minimum 2-foot shoulder on the west side and a minimum 10-foot shoulder on the east side. Disabled vehicles and emergency responders would use the east side of the corridor during emergency situations. The easternmost travel lane (11 feet wide) along with the eastern shoulder (generally 10 feet) would provide a 21-foot wide travel way which would be sufficient for the emergency vehicles to access incidents along the corridor. Additionally, enforcement/emergency pull-off areas have been proposed where space is available including in the vicinity of Seminary Road Interchange, Shirlington Interchange, and King Street Interchange.

The Build Alternative was developed using current design guidelines including the American Association of State Highway and Transportation Officials (AASHTO) *A Policy on the Geometric Design of Highways and Streets, 2011* (Green Book) and the VDOT Road Design Manual (April, 2016). A Technical Working Group (TWG), comprised of VDOT, FHWA, 95 Express, and support staff, was formed to guide the development of the Build Alternative. The TWG met on a weekly basis to discuss design issues and constraints and to reach consensus on project design.

2.3.2.1 Proposed Access Points to the HOT Lanes

Table 2-2 summarizes the proposed access modifications along the I-395 study corridor associated with the Build Alternative. With the exception of the Eads Street Interchange, all existing access points would remain in their current geometric configuration. Traffic operations at the northern terminus of the proposed I-395 HOT lanes in the vicinity of the Eads Street Interchange are a critical component of the proposed improvements as discussed in detail in **Section 2.3.2.2**. With the exception of the south facing ramp at the Seminary Road Interchange which would remain a HOV ramp at all times, all other access points to and from the proposed I-395 HOT lanes would be converted to HOT ramps.

2.3.2.2 Eads Street Interchange

The Build Alternative includes modifications to the Eads Street Interchange at the proposed northern terminus of the I-395 HOT lanes. The Eads Street Interchange is a critical location in the I-395 HOT lanes system as Eads Street serves the Pentagon Reservation and the Pentagon Transit Center, a major transit hub for the Washington, D.C. region and is a primary origin and destination for transit providers and motorists using the existing I-395 HOV lanes.

Several options have been considered for the Eads Street Interchange. Accessibility and congestion reduction in this area are critical elements for future use of the I-395 HOT lanes. The Eads Street Interchange poses challenges in balancing the needs of all transportation users including transit vehicles, HOV and non-HOV motorists, and pedestrians.

Another key component of the Eads Street Interchange is compatibility with improvements proposed on the Pentagon Reservation. The 2015 Master Plan Update for the Pentagon Reservation establishes a long-term vision for the Pentagon and surrounding facilities, including a reconfiguration of the Pentagon South Parking Lot (Washington Headquarters Service, 2015). The exact timing of the implementation of the

proposed South Parking Lot Improvements is not known at this time and is dependent on federal approvals and funding availability.

Table 2-2: Access Point Modifications

Access Point		Access	
		Existing	Build Alternative
Turkeycock Run (north of Edsall Road)		AM: Full access between NB HOV/HOT lanes and GP lanes PM: Full access between SB HOV/HOT lanes and GP lanes	AM: Full access between NB HOT lanes and GP lanes PM: Full access between SB HOT lanes and GP lanes
Seminary Road – South Facing Ramp		AM: NB access from HOV lanes PM: SB access to HOV lanes (HOV at all times)	No change (would remain HOV at all times)
Seminary Road – North Facing Ramp		AM: NB access to HOV lanes PM: SB access from HOV lanes	AM: NB access to HOT lanes PM: SB access from HOT lanes
Shirlington Road – North Facing Ramp		AM: NB access to HOV lanes PM: SB access from HOV lanes	AM: NB access to HOT lanes PM: SB access from HOT lanes
Washington Boulevard – South Facing Ramp		AM: NB access from HOV lanes PM: SB access to HOV lanes	AM: NB access from HOT lanes PM: SB access to HOT lanes
Eads Street Interchange	Ramp from SB HOV Lanes to SB GP Lanes (south of Eads Street)	AM & PM: SB access from HOV lanes	Capacity and operational improvements to be evaluated as part of the Interchange Modification Report.
	Eads Street – NB Off Ramp from HOV	AM: NB access from HOV lanes PM: Closed	
	Eads Street – SB On Ramp to HOV	AM & PM: SB access to HOV lanes	
	Eads Street – NB On Ramp to HOV	AM & PM: NB access to HOV lanes	
	Eads Street – SB Off Ramp from HOV	AM & PM: SB access from HOV lanes	
NB Ramp from GP Lanes to HOV Lanes north of Eads Street		AM & PM: NB access to HOV lanes	AM & PM: NB access to HOT lanes

2.3.2.2.1 Eads Street Initial Interchange Options Considered

An initial range of twelve options for the Eads Street Interchange were considered as part of the original efforts to develop the I-395 Express Lanes project between 2004 and 2009, generally consisting of two families of options:

- *Dedicated Entry and Exit Ramps To and From I-395 HOT Lanes:* Options A and B maintain the current ramp configurations between the I-395 HOT lanes and Eads Street including a northbound I-395 HOT lanes off-ramp to Eads Street and a southbound on-ramp from Eads Street to the southbound I-395 HOT lanes.

- *Dual Reversible Entry and Exit Ramps To and From I-395 HOT Lanes:* Options C through L all include a reversible operation of one or both of the ramps between Eads Street and the I-395 HOT lanes south of Eads Street in addition to modifications to traffic flow and lane configurations along Eads Street and South Rotary Road.

The initial Eads Street Interchange options, and reasons why each option was eliminated from further consideration, are described in detail in the *Alternatives Analysis Technical Report* (VDOT, 2016a). **Table 2-3** summarizes the twelve options previously studied and the reasons why the options were eliminated from further consideration or retained as part of the current study efforts.

Table 2-3: Reason Option Eliminated or Retained for Further Consideration

Option	Reason Option Eliminated or Retained for Further Consideration
Dedicated Entry/Exit Ramps To and From I-395 HOT Lanes	
A	Provides minimal capacity increase on the Eads Street off-ramp from the NB I-395 HOV lanes. <i>A modification to this option that provides additional capacity on the ramp was retained for further consideration as part of the current study efforts.</i>
B	Not consistent with the Pentagon Master Plan along S. Rotary Road due to proposed conversion from one-way to two-way operation west of Eads Street.
Dual Reversible Entry/Exit Ramps To and From I-395 HOT Lanes	
C	Not consistent with the Pentagon Master Plan due to proposed one-way inbound pattern on Eads Street during the AM peak period.
D	Not consistent with the Pentagon Master Plan due to bus-only movements on Eads Street west of South Rotary Road.
E	Not consistent with the Pentagon Master Plan due to proposed one-way inbound pattern on Eads Street during the AM peak period and prohibition of EB through traffic on South Rotary Road during the AM and PM peak periods.
F	Not consistent with the Pentagon Master Plan due to prohibition of SB Eads Street through traffic at South Rotary Road.
G	Provides minimal capacity increase on the Eads Street off-ramp from the NB I-395 HOV lanes to movement restrictions along Eads Street and prohibition of EB South Rotary Road through movements at Eads Street.
H	Not consistent with the Pentagon Master Plan due to proposed one-way inbound pattern on Eads Street during the AM peak period (for non-transit vehicles) and prohibition of EB through traffic on South Rotary Road at Eads Street during the AM and PM peak periods.
I	Directing all traffic entering the Pentagon Reservation (excluding transit vehicles) to use Army Navy Drive and Fern Street would substantially increase traffic volumes to these surface streets and would increase pedestrian and vehicle conflicts. Fern Street is the designated pedestrian route to the Pentagon. <i>This option was retained for further consideration as part of the current study efforts due to the minimal impact on the I-395 bridges and potential simplification of the Eads Street intersection operations.</i>
J	Not consistent with the Pentagon Master Plan due to the prohibition of EB South Rotary Road right-turn movements at Eads Street and SB Eads Street movements at South Rotary during the AM peak period. During the PM peak, Eads Street would operate one-way SB for buses only which is also not consistent with the Pentagon Master Plan.

Option	Reason Option Eliminated or Retained for Further Consideration
K	Not consistent with the Pentagon Master Plan due to the prohibition of the EB South Rotary Road left-turn and right-turn movements and SB Eads Street movements at the Eads Street at South Rotary Road intersection during the AM peak period. Additionally, Eads Street between North Rotary Road and South Rotary Road would operate one-way NB for buses only which is not consistent with the Pentagon Master Plan.
L	Widening of the I-395 HOV bridges over Fern Street and potentially Eads Street would result in major disruption to traffic during construction.

2.3.2.2.2 Eads Street Refined Interchange Options Considered

The initial twelve options considered as part of the 2004 through 2009 studies were reviewed to develop two refined options and two new options to be considered as part of the current study efforts that would best meet the project purpose and need and current constraints of the project, including the proposed improvements associated with the Pentagon Master Plan. The four refined options are discussed below:

Single Reversible Eads Street Ramp

The single reversible Eads Street ramp option would convert the existing I-395 northbound HOV off-ramp to Eads Street into a widened three-lane, reversible ramp. All existing traffic movements would be maintained at the Eads Street Interchange with additional capacity provided to and from Eads Street during the AM and PM peak hours. Traffic signals would be provided along Eads Street at both the northbound and southbound I-395 HOT ramps. Expansion of the existing northbound I-395 HOV off-ramp to three lanes would require reconstruction of the I-395 HOV bridges over Fern Street and potentially Eads Street which would result in major access and maintenance of traffic challenges during construction and therefore, this option was not considered further.

Dedicated Bus Lane and Right-Turn Lane

This option would widen the northbound I-395 HOV off-ramp to Eads Street and establish a bus-only left-turn lane and right-turn lane along the ramp. All traffic (excluding buses) would be directed to make a right-turn onto Eads Street toward the Army Navy Drive intersection. Traffic would then continue to Fern Street to access the Pentagon Reservation. In this option, Eads Street through traffic would be limited to transit based vehicles by creating dedicated bus lanes from the HOT lanes to the Pentagon Reservation. Although the dedicated bus lanes create a more roundabout method of entering the Pentagon for non-transit traffic, this option simplifies the Eads Street intersection operations and prevents reconstruction of the existing I-395 bridges.

Directing all traffic entering the Pentagon Reservation from the I-395 northbound HOT lanes (excluding transit vehicles) to use Army Navy Drive and Fern Street would increase traffic volumes along these streets and would require roadway improvements to mitigate the impacts. Additionally, the diverted traffic volumes would increase pedestrian and vehicle conflicts since Fern Street is the designated pedestrian route to the Pentagon (pedestrians are currently prohibited along Eads Street). Lastly, this option would provide a minimal increase to capacity on the Eads Street ramp compared to existing conditions. For these reasons, this option was not considered further.

Diverging Diamond Interchange

A diverging diamond at the Eads Street Interchange would shift mainline traffic on Eads Street to the opposite side of the roadway in order to receive the I-395 HOT ramps beyond the two proposed signals. All existing traffic movements would be retained with this option. The ramps would maintain their current operational functionality as exit/entrance ramps from the I-395 HOV (future HOT) lanes. The proposed diverging diamond configuration would simplify I-395 HOT egress and ingress movements, as well as reduce the number of signal phases at the ramp signals. Although this option would reduce the number of turning conflicts at the interchange, introducing a diverging diamond at this location is unconventional considering the traffic volumes, emergency evacuation procedures at the Pentagon Reservation, and the dual general purpose and proposed HOT system.

In order to achieve the desired crossover intersection angles (i.e., as close as possible to 90 degrees), this option would likely require reconstruction of the I-395 HOV bridge over Eads Street. This would result in access and maintenance of traffic challenges during construction and therefore this option was not considered further.

Dual Reversible Eads Street Ramps

The Dual Reversible Eads Street Ramps option would increase capacity to and from Eads Street by dividing traffic between two reversible ramps providing a total of four ramp lanes traveling to and from Eads Street. The northbound I-395 HOV off-ramp to Eads Street would operate northbound in the AM peak period and southbound in the PM peak period for traffic traveling to and from Army Navy Drive and the Pentagon City area. The existing ramp from Eads Street to the southbound I-395 HOV lanes would be expanded to two lanes approaching the intersections at Eads Street and operate northbound in the AM peak period and southbound in the PM peak period for traffic traveling to and from the Pentagon Reservation. The use of existing ramp and bridge infrastructure would not require reconstruction of the interchange and comparatively reduced maintenance of traffic impacts.

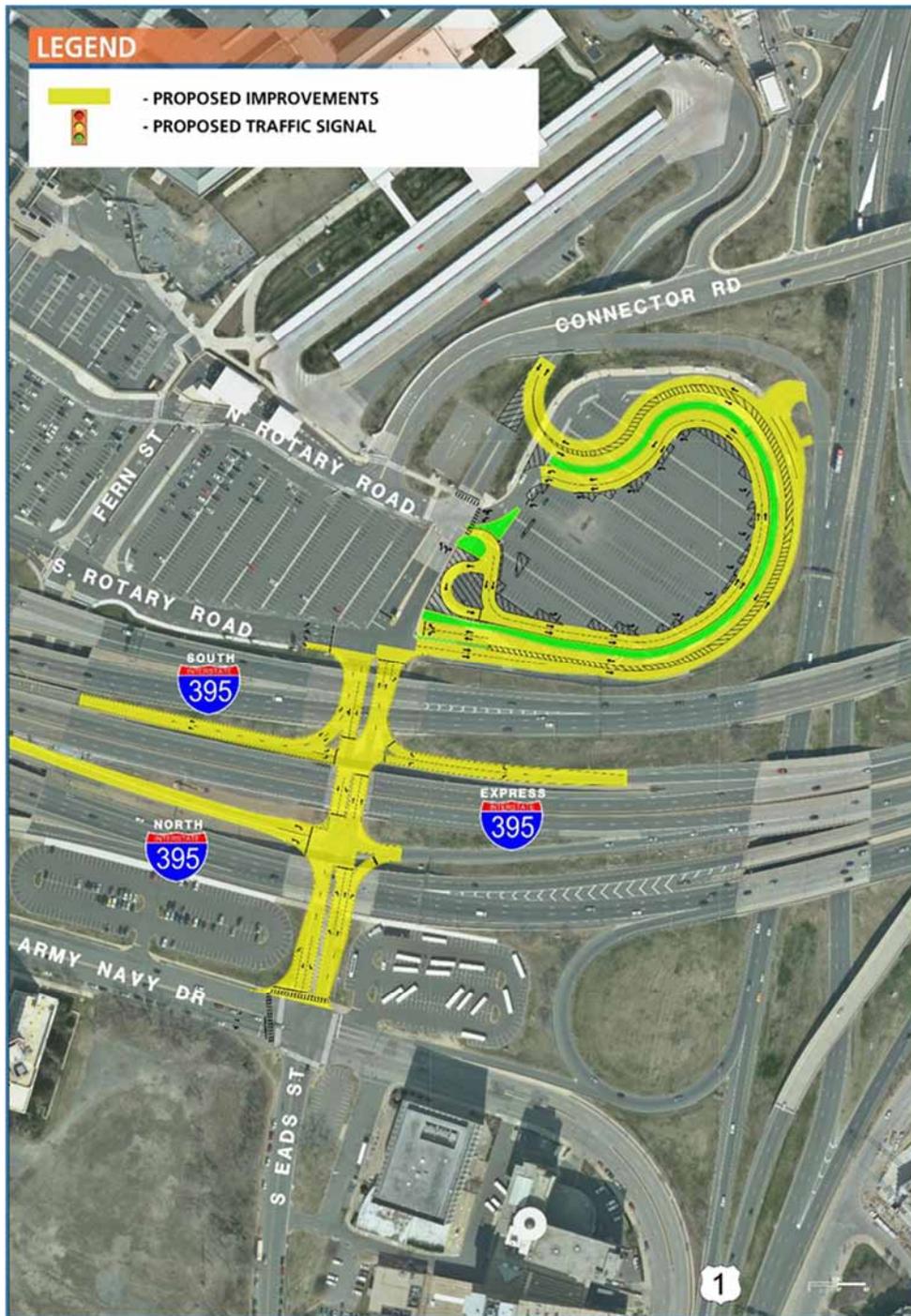
As part of this option, the access to the southbound I-395 general purpose lanes from the existing southbound I-395 HOV lanes would be removed. Access to the southbound I-395 general purpose lanes would be provided via Hayes Street/Army Navy Drive, Washington Boulevard/Columbia Pike, and Boundary Channel Drive instead of the current ramp. This would eliminate a weave condition along the southbound I-395 HOV lanes and eliminate a merge condition along the southbound I-395 general purpose lanes in an area with a high density of access points.

This option would retain the current circulation patterns within the Pentagon Reservation and is consistent with the Pentagon Master Plan improvements in the Pentagon South Parking Lot. Four traffic signals would be constructed along Eads Street at the two I-395 HOT ramp intersections, at South Rotary Road, and at North Rotary Road.

2.3.2.2.3 Eads Street Preferred Option

Included as part of the Build Alternative, the Dual Reversible Eads Street Ramps option was selected as the preferred option for detailed study because this option increases capacity on the two ramps serving Eads Street from the south (providing for ramp lanes) and minimizes turning conflicts at the signalized intersections proposed along Eads Street (see **Figure 2-7**). This option also minimizes disruption to the Pentagon South Parking Lot compared to others previously considered.

Figure 2-7: Eads Street Interchange Concept and Pentagon Improvements



2.3.2.3 Pentagon Interim Improvements

As noted above, the timing of the improvements to the Pentagon South Parking Lot is unknown at this time; however, some improvements to the South Parking Lot are required in order to create a smooth transition between the improvements planned at the Eads Street Interchange and within the Pentagon Reservation. As such, VDOT has worked closely with Pentagon staff to develop an interim improvement for the South

Parking Lot that is part of the Build Alternative and is consistent with the longer term Master Plan improvements and would allow the Eads Street Interchange to operate effectively until the ultimate improvements are implemented. As shown in **Figure 2-7** and documented in the *Alternatives Analysis Technical Report* (VDOT, 2016a), the interim improvements incorporate the following components:

- Direct access to the Pentagon Transit Center via a dedicated two-way bus loop that circulates on the eastern perimeter of the South Parking Lot. Transit vehicles would be separated from passenger vehicles and substantial pedestrian conflicts along North Rotary Road.
- Traffic signalization at the Eads Street at South Rotary Road and Eads Street at North Rotary Road intersections. These signals would be coordinated to provide smooth traffic flow and would be coordinated with the signals along Eads Street at the I-395 HOT ramps and Army Navy Drive.
- A dedicated ridesharing (slugging) area within the parking lot surrounded by the bus loop to accommodate the substantial ridesharing that occurs within this portion of the South Parking Lot.
- A fourth lane along eastbound South Rotary Road approaching Eads Street that would be used to access the future HOT lanes.

2.3.2.4 Structure and Bridge Rehabilitation

No new structures and bridges, or structure and bridge replacements are included as part of the I-395 Express Lanes Project. The Build Alternative includes design and construction of repairs and modifications to various existing bridges (general purpose and HOV) along, over, and adjacent to the proposed I-395 Express Lanes, including but not limited to (detailed information on structure and bridge rehabilitation for this study are included in **Appendix B** of the *Alternatives Analysis Technical Report* (VDOT, 2016a)):

- Mainline Bridges – replacement of bridge barriers/railing systems (includes reconstruction of selected general purpose lane bridge barriers), joint reconstruction at abutments, elimination of joints at piers, deck repairs, milling/hydro-demolition and overlay of selected decks, widening and repairs to approach slabs, widening of one bridge (I-395 HOV Bridge over Country Club Road), backwall reconstruction, beam seat repairs and reconstruction, replace bearing pads, clean and paint beam ends and bearings, modifications related to addition of conduit duct bank, installing new deck drain systems, surface repairs and waterproofing of existing barriers, and substructure repairs to the following bridges:
 - I-395 over Sanger Avenue;
 - I-395 over West Braddock Road;
 - I-395 HOV & Bus Ramp over Four Mile Run;
 - I-395 over Glebe Road;
 - I-395 over Ramp G (Glebe Road);
 - I-395 HOV over Country Club Road;
 - I-395 HOV over EB Route 27 (Washington Boulevard);
 - I-395 HOV & NBL over Route 27 NBL & Joyce Street;
 - I-395 HOV NB and SB over Ramps CC and CE;
 - I-395 HOV over Fern Street;
 - I-395 HOV over Eads Street;
 - I-395 HOV NB and SB over Route 110; and

- I-395 HOV over Pentagon Access Road.
- Ramp Bridges – repairs, including joint reconstruction at abutments, elimination of joints at piers, deck and approach slab repairs, milling/hydro-demolition and overlay of selected decks, beam seat reconstruction, clean and paint beam ends and bearings, surface repairs and waterproofing of curbs and parapets, railing post anchor bolt adjustments, replacing guardrail transitions, and substructure repairs to the following bridges:
 - Ramp B over I-395 SBL;
 - Seminary Road HOV Bus Ramp;
 - Shirlington HOV Bus Ramp;
 - Route 27 Reversible Ramp over Joyce Street; and
 - Ramp G of I-395 NB Lane over Route 110.
- Pier Protection - addition of structurally independent, crashworthy ground-mounted 54-inch high pier protection barriers at bridges over the 395 Express Lanes.
- Bridge-Mounted Signs - removal of existing sign attachments and/or supports at three existing bridges.

Ability of the Build Alternative to Address the Purpose and Need

2040 No Build and 2040 Build peak hour traffic volumes for northbound and southbound I-395 for both the general purpose and HOV/HOT lanes are summarized in **Figures 2-8 and 2-9**, respectively. As shown, under the Build Alternative, a higher proportion of traffic is carried within the HOT lanes compared to the No Build Alternative resulting in congestion relief within both the general purpose and HOT lanes during peak periods.

A comparison of travel times for 2040 No Build and 2040 Build conditions is summarized in **Figures 2-10 and 2-11** for the peak travel direction (northbound in the AM peak period and southbound in the PM peak period) for each of the four analysis hours (6 AM to 10 AM and 3 PM to 7 PM). **Figures 2-12 and 2-13** summarize the travel speeds by segment for No Build conditions and Build conditions for the northbound I-395 and southbound I-395 travel directions, respectively. **Figures 2-14 and 2-15** summarize the person throughput along I-395 for existing conditions, No Build conditions, and Build conditions in the peak direction at two locations along I-395 – north of Turkeycock Run and north of Glebe Road – for the four-hour analysis periods during the AM and PM peak periods indicating that the Build Alternative has a higher capacity to move people with the availability of the I-395 Express Lanes.

AM Peak Period – Northbound General Purpose Lanes: Under 2040 Build conditions, travel times along the northbound I-395 general purpose lanes decrease by 10 to 11 minutes from 8 AM to 10 AM when compared to 2040 No Build conditions. Travel times increase by up to 2 minutes between Route 1 and the north end of the study area due to higher traffic volumes in the general purpose lanes in this section of the study area compared to No Build conditions.

AM Peak Period – Northbound HOV/HOT Lanes: From 7 AM to 10 AM, travel times decrease by 1 to 6 minutes. From 7 AM to 9 AM, travel times decrease by 1 to 1.5 minutes south of Turkeycock Run as there are fewer northbound motorists in the HOT lanes attempting to exit to the general purpose lanes and

encountering lower congestion levels in the general purpose lanes compared to No Build conditions. Travel times decrease by approximately 4 minutes from 8 to 9 AM between Eads Street and 14th Street in the District as a result in lower traffic volumes and congestion levels in this section compared to No Build conditions.

PM Peak Period – Southbound General Purpose Lanes: Under 2040 Build conditions, travel times along the southbound I-395 general purpose lanes decrease by 6 to 16 minutes between 3 PM and 6 PM. Travel times decrease incrementally from the northern study limits to approximately Glebe Road from 3 PM to 6 PM with an average of 11 minutes of travel time savings over the three hours.

PM Peak Period – Southbound HOV/HOT Lanes: Travel times from 3 PM to 5 PM and 6 PM to 7 PM remain approximately the same in the southbound HOV/HOT lanes when comparing 2040 No Build to Build conditions.

Figure 2-8: 2040 No Build and 2040 Build AM Peak Hour – Northbound I-395

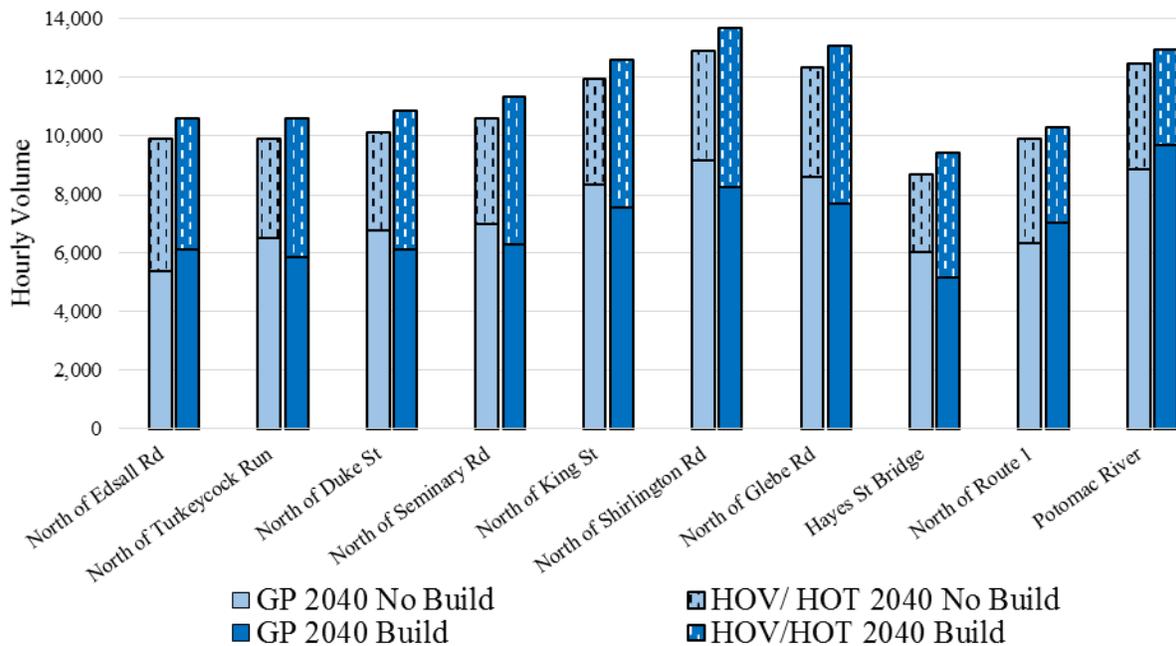


Figure 2-9: 2040 No Build and 2040 Build PM Peak Hour – Southbound I-395

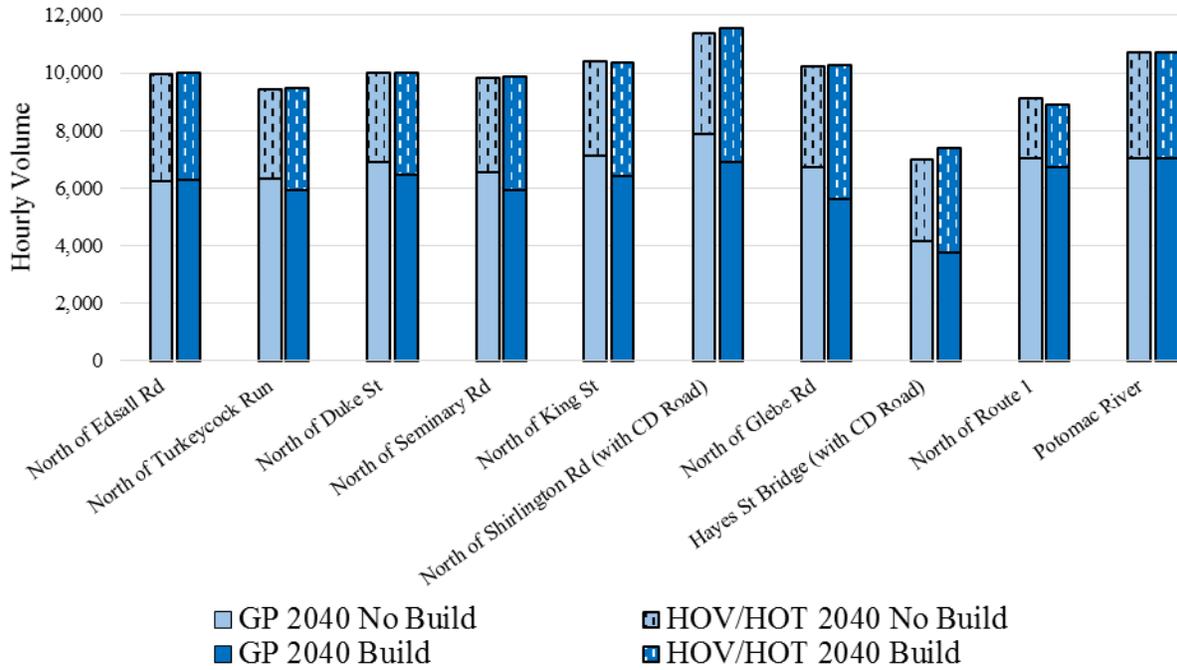


Figure 2-10: Northbound Overall Travel Time Summary - AM Peak Period

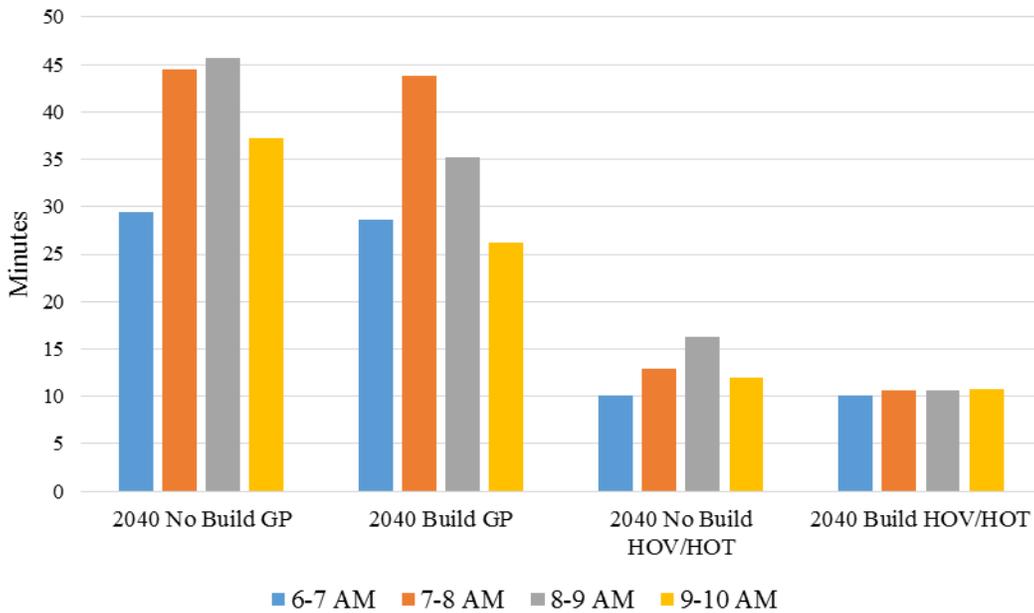


Figure 2-11: Southbound Overall Travel Time Summary - PM Peak Period

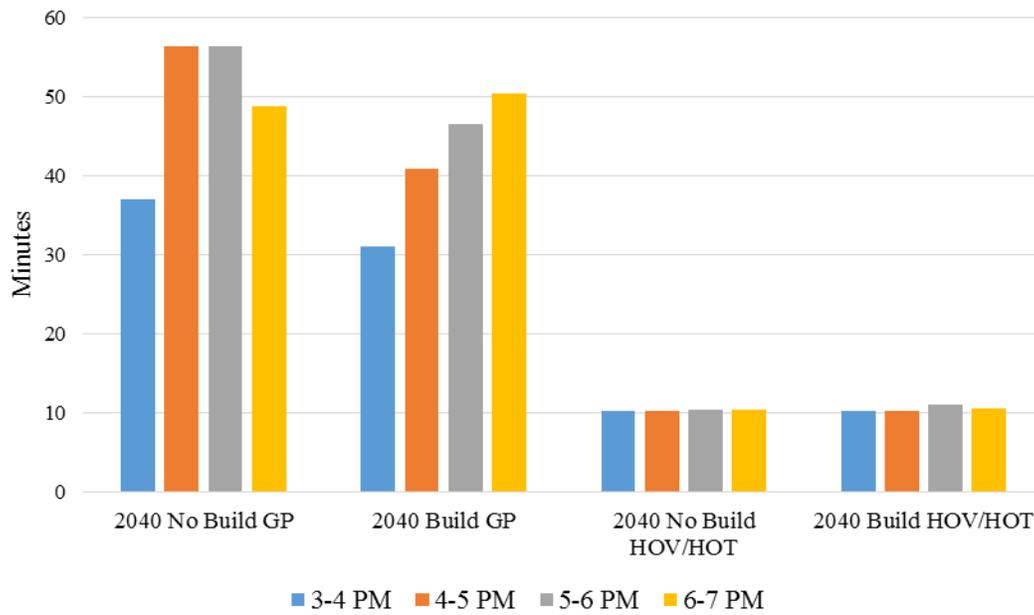


Figure 2-12: AM Peak Period Travel Speeds – Northbound I-395

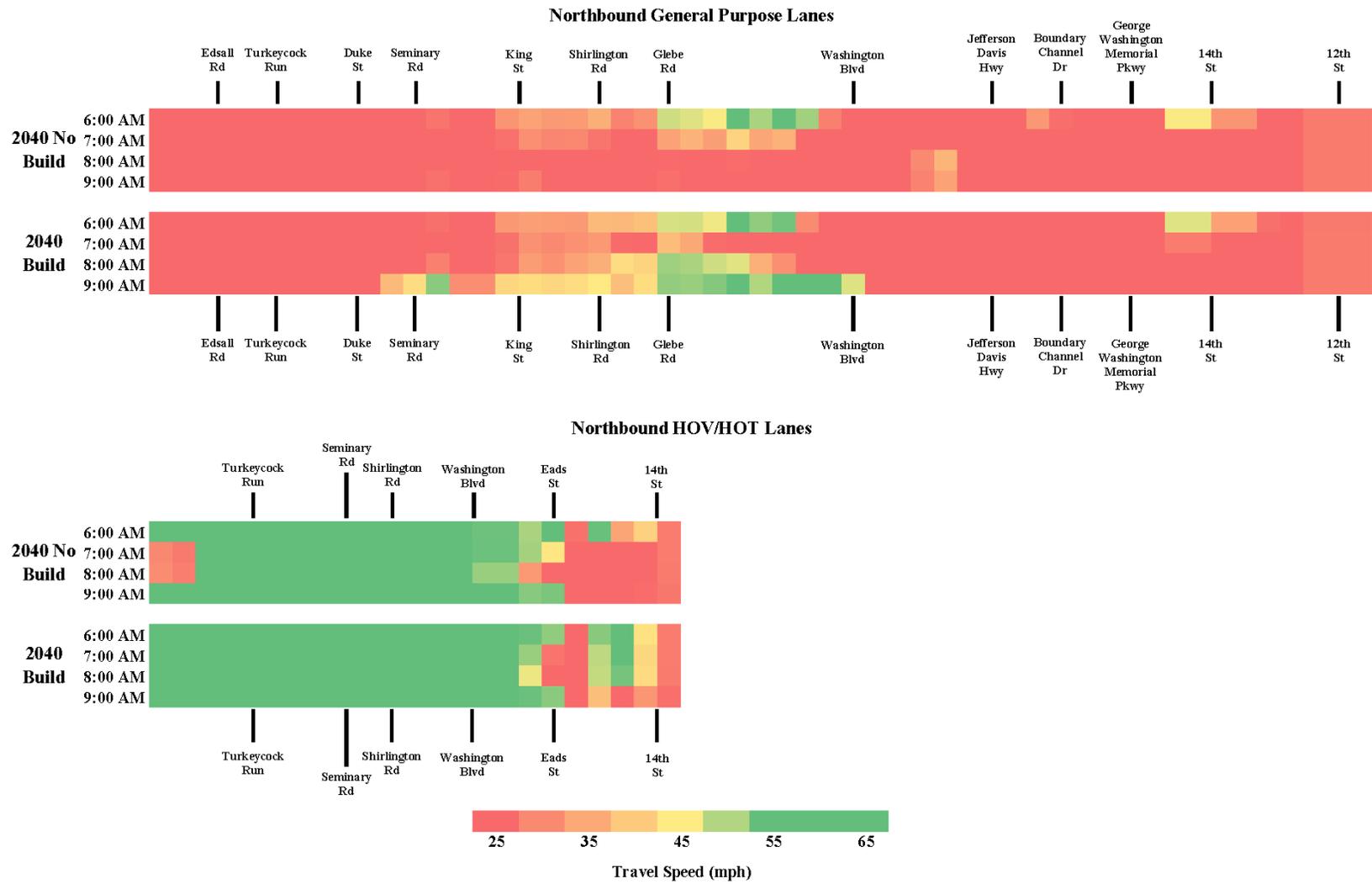


Figure 2-13: PM Peak Period Travel Speeds – Southbound I-395

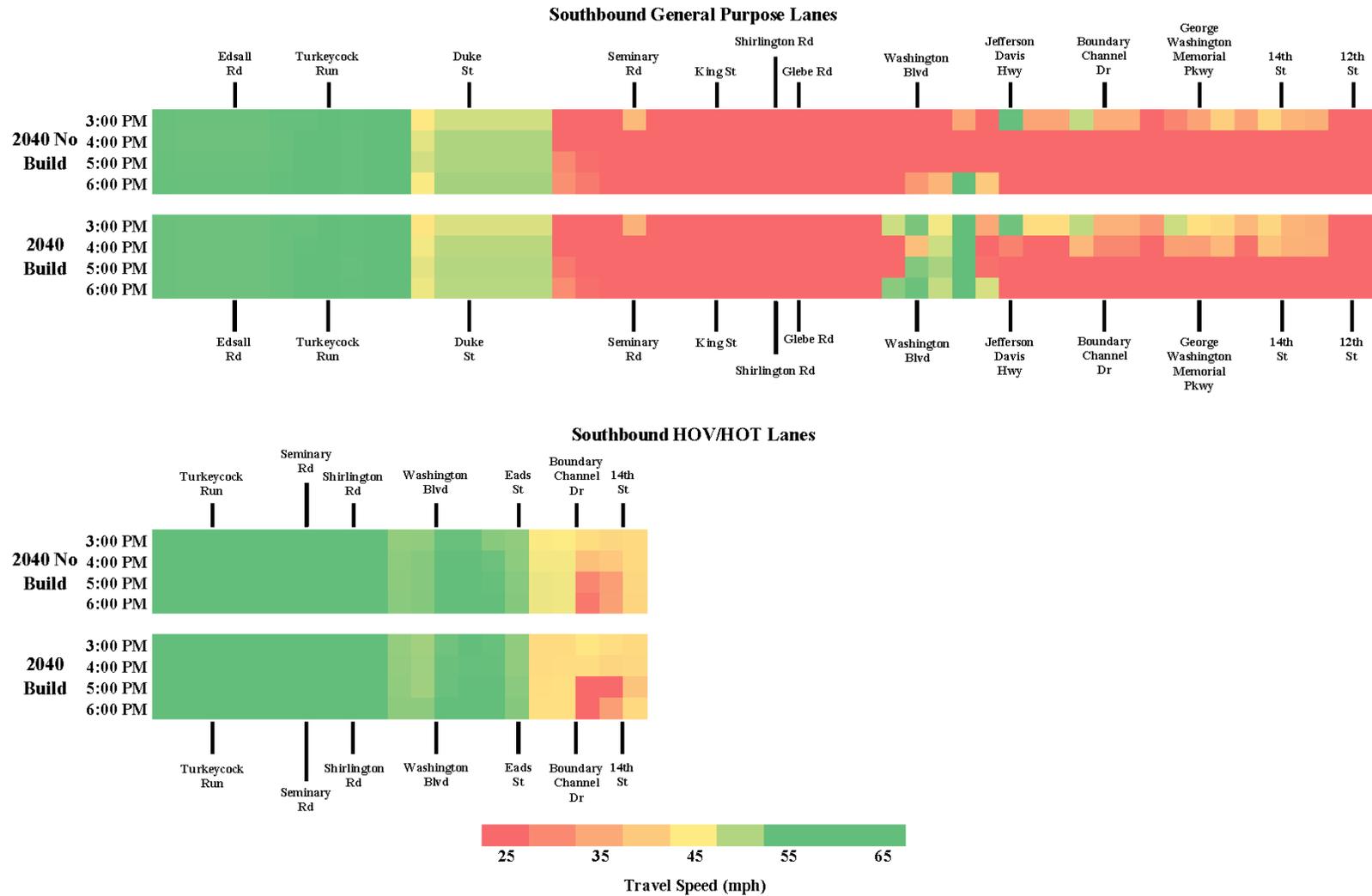


Figure 2-14: Northbound AM Peak Period Person Throughput Comparison

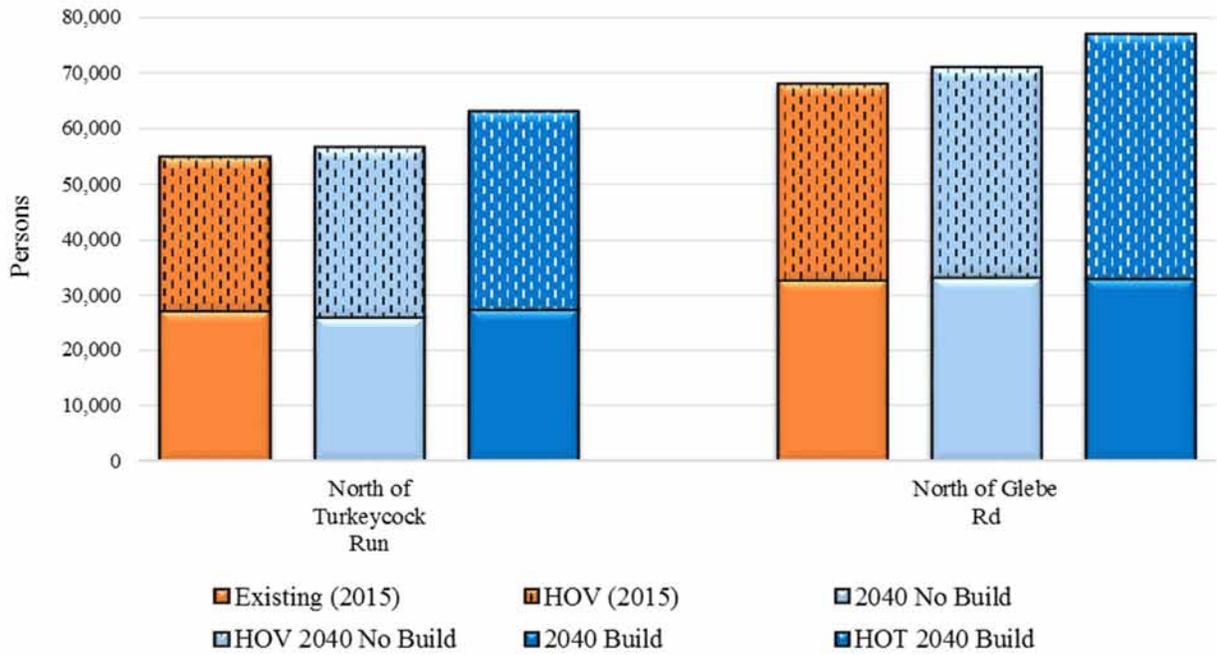
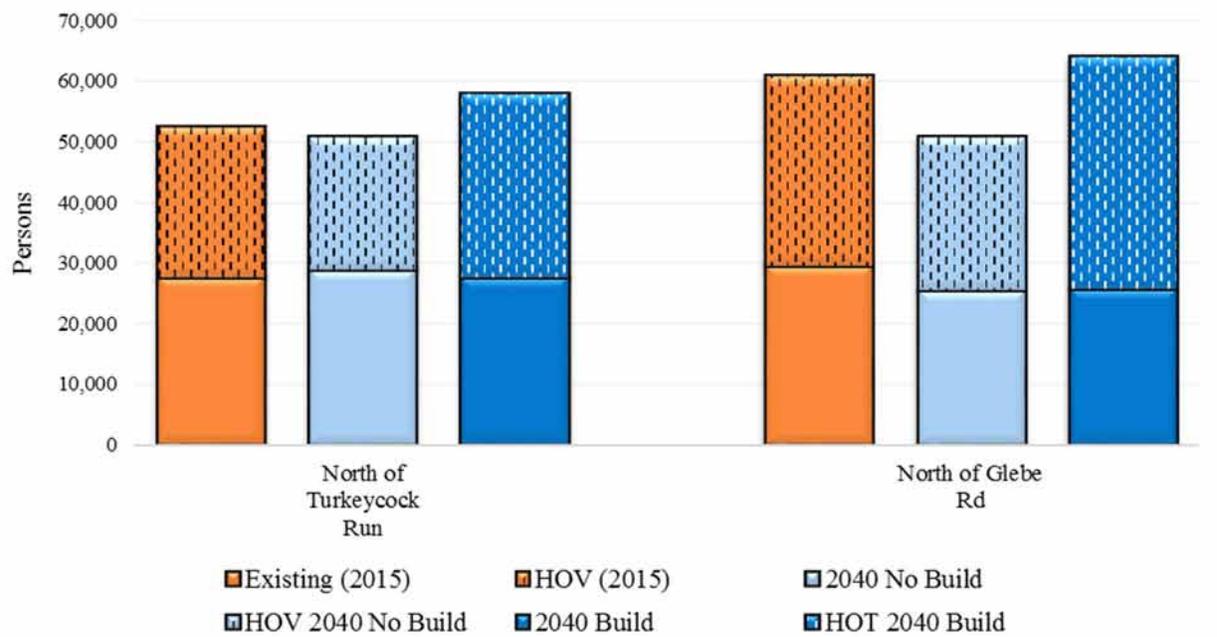


Figure 2-15: Southbound PM Peak Period Person Throughput Comparison



In addition to reducing congestion and overall travel times in both the I-395 general purpose and HOV lanes during peak periods described above, the extension of the I-395 Express Lanes would increase roadway safety, provide additional travel choices, and improve travel reliability. The congestion reduction benefits would reduce the potential for congestion-related rear end crashes in both the general purpose and HOV lanes, which account for more than half of all reported crashes. The I-395 Express Lanes would offer consistent and reliable travel times for all roadway users including HOV motorists and transit buses and provide an additional travel choice for vehicles with less than three occupants that want to continue north along the I-95 / I-395 Express Lanes facility north of the Turkeycock Run Interchange or access the southbound Express Lanes facility exiting Washington, D.C. Although congestion would still exist during peak hours in the general purpose lanes as well as the I-395 Express Lanes approaching Washington, D.C., overall travel speeds would increase and travel times would decrease compared to the No Build Alternative. Additional details are included in the *Traffic and Transportation Technical Report* (VDOT, 2016j).

CHAPTER 3.0 ENVIRONMENTAL CONSEQUENCES

3.1 INTRODUCTION AND OVERVIEW OF ENVIRONMENTAL ISSUES

Social, economic, physical and natural resources have the potential to be affected during transportation projects. Therefore, existing environmental conditions and potential impacts are important to identify and understand. The following sections inventory and analyze the potential environmental effects associated with the No Build Alternative and Build Alternative considered in the Interstate 395 (I-395) Express Lanes Northern Extension Project (Northern High Occupancy Toll [HOT] Lanes) study to extend the I-95 Express Lanes in the City of Alexandria, and Arlington and Fairfax Counties, Virginia. **Table 3-1** summarizes the environmental conditions within the study area and, where applicable, summarizes the estimated environmental impacts to those resources for the No Build Alternative and Build Alternative.

Table 3-1: Summary of Environmental Conditions

Environmental Resource	Resource Summary	Potential Environmental Impact	
		No Build Alternative	Build Alternative
Demographics/ Property Impacts	The Interstate is located in an expanding and demographically diverse region of Northern Virginia. The majority of the project would be constructed within existing Virginia Department of Transportation (VDOT) right of way, requiring no relocations or displacements. The project may result in permanent and/or temporary easements for the placement of signs and noise barriers (see Section 3.2).	Right of Way Acquisition and/or Easements (acres)	
		0	5.30
Environmental Justice	The impacts associated with the No Build and Build Alternatives would not disproportionately impact minority or low-income populations (see Section 3.3).	No disproportionate impacts	
Land Use	All localities along the study area are highly urbanized with mixed use development. The No Build Alternative would have no impact on land use. The Build Alternative is not expected to encourage or accelerate any changes in land use that are not already expected (see Section 3.4).	No substantial impacts	
Community Facilities	The No Build Alternative would have no impacts on community facilities. The Build Alternative has potential to alleviate congestion contributing to minor beneficial increments to community facilities (see Section 3.5).	No substantial impacts	
Recreational Resources	The No Build Alternative would have no substantial impacts on recreational resources. The Build Alternative has the potential to alleviate congestion contributing to minor beneficial increments to recreational resources (see Section 3.6).	No substantial impacts	
Cultural Resources	The Virginia Department of Historic Resources (VDHR) and the District of Columbia State Historic Preservation Office (DC SHPO) have reviewed the undertaking in accordance with the National Historic Preservation Act (NHPA) and concurred that the project will have No Adverse Effect on historic properties. During the design process, additional coordination with VDHR and the DC SHPO will be conducted when more detail is available regarding the need for and design of noise barriers in the vicinity of the historic resources (see Section 3.7).	Historic Resource Properties (acres)	
		0	2.41*
Air Quality	In accordance with VDOT and FHWA guidance, as well as requirements established by the US Environmental Protection	No violation of NAAQS	

Environmental Resource	Resource Summary	Potential Environmental Impact	
		No Build Alternative	Build Alternative
	Agency (EPA), changes in existing carbon monoxide (CO), particulate matter (PM) and mobile source air toxics (MSATs) have been analyzed, in addition to potential construction emissions. As a result of these analyses, no adverse impacts to ambient air quality or human health and welfare are anticipated. In addition, the study alternatives are not expected to cause or contribute to any violations of National Ambient Air Quality Standards (NAAQS) (see Section 3.8).		
Noise	Overall, residential and recreational noise impacts are predicted to occur under the No Build and Build Alternatives. Due to the increased congestion in the future Design Year, noise impacts from the No Build Alternative are slightly less than those under Existing Conditions (2,500). A total of 8.1 miles of barriers have preliminarily been identified as being feasible and reasonable. These noise barriers would benefit 2,027 of the impacted receptors, as well as 2,626 not impacted receptors, at an estimated cost of \$28 million (see Section 3.9).	Noise Receptors (no.)	
		2,419	2,857
Wetlands and Streams	While the roadway would not impact any streams or wetlands, the noise barrier installation has the possibility to result in direct impacts to wetlands (see Section 3.10).	Stream Impacts (linear feet)	
		0	0*
		Wetlands (acres)	
		0	0.004*
Water Quality	Both the No Build and Build Alternatives would have limited direct impacts on water quality (see Section 3.11).	No substantial impacts	
Floodplains	Encroachments on Federal Emergency Management Agency (FEMA)-designated floodplains would be minimal for the Build Alternative; federal regulation and VDOT design parameters would minimize potential effects to floodplains (see Section 3.12).	100-Year Floodplain (acres)	
		0	0.09*
		500-Year Floodplain (acres)	
		0	0.01*
Wildlife and Habitat	The Build and No Build Alternatives would have no impact on habitat or result in the displacement of wildlife. Although there are three wildlife corridors surrounding the study area, none of the wildlife corridors would be modified by the Build Alternative and the Build Alternative would not add impediments to the wildlife utilization. Noise barriers may be placed adjacent to the road and wildlife corridors, but would not impede wildlife movement any more than the existing highway and culverts (see Section 3.13).	Minimal impacts	
Threatened, Endangered, and Special Status Species	Two federally listed species were identified within the vicinity of the project study area: the northern long-eared bat and the dwarf wedgemussel. The northern long-eared bat would not likely be adversely affected and the dwarf wedgemussel would not be impacted by the project. Anadromous Fish Use areas are within two miles of the study area; however, no Anadromous Fish Use areas are currently mapped within the study area and no species are expected to be impacted. However, because Anadromous Fish Use areas are mapped downstream of the study area, any impacts to streams may be subject to time-of-year-restrictions, and, therefore, may require additional resource agency coordination. Further coordination with agencies and	No adverse effects	

Environmental Resource	Resource Summary	Potential Environmental Impact	
		No Build Alternative	Build Alternative
	final effect determinations would be conducted as a part of the 401/404 permit process (see Section 3.14).		
Hazardous Materials	A search of federal and state agency databases identified eight sites of elevated environmental concern within the study area. Reported releases or spills associated with the sites may have potential to impact soil and groundwater in the study area (see Section 3.15).	Sites will be managed and handled in accordance with federal, state, and local procedures	
Indirect and Cumulative Effects	Indirect and cumulative effects from both the No Build and Build Alternatives are expected to be minimal since the proposed improvements are to an existing facility within existing right of way in an environment that is highly developed. Additionally, no induced growth is to be expected as a result of the Build Alternative. The study area and surrounding localities are already highly developed and any growth would continue regardless of the conditions of the surrounding roadway network (see Section 3.16).	Minimal impacts	
Section 4(f)	Minor right of way impacts may occur to several historic properties as a result of noise barriers. If right of way impacts occur, the Section 4(f) use would likely be considered a <i>de minimis</i> impact (see Section 3.17).	Section 4(f) Use (acres of use to historic properties)	
		0	2.41*

*Currently, 5.91 acres of potential impact are estimated for the construction of noise barriers, with 2.41 acres outside of the VDOT right of way and within historic districts (3.50 acres of potential impact are within VDOT right of way). The 2.41 acres of impact would be considered a Section 4(f) use. This value is based on a conservative estimate of the right of way width required to construct and maintain the barriers (approximately 30 feet). VDOT anticipates that during the final design noise analysis, barrier locations would be refined and may be shifted to be fully located within the VDOT right of way. Additional coordination with the VDHR and DC SHPO will be conducted based on further design details.

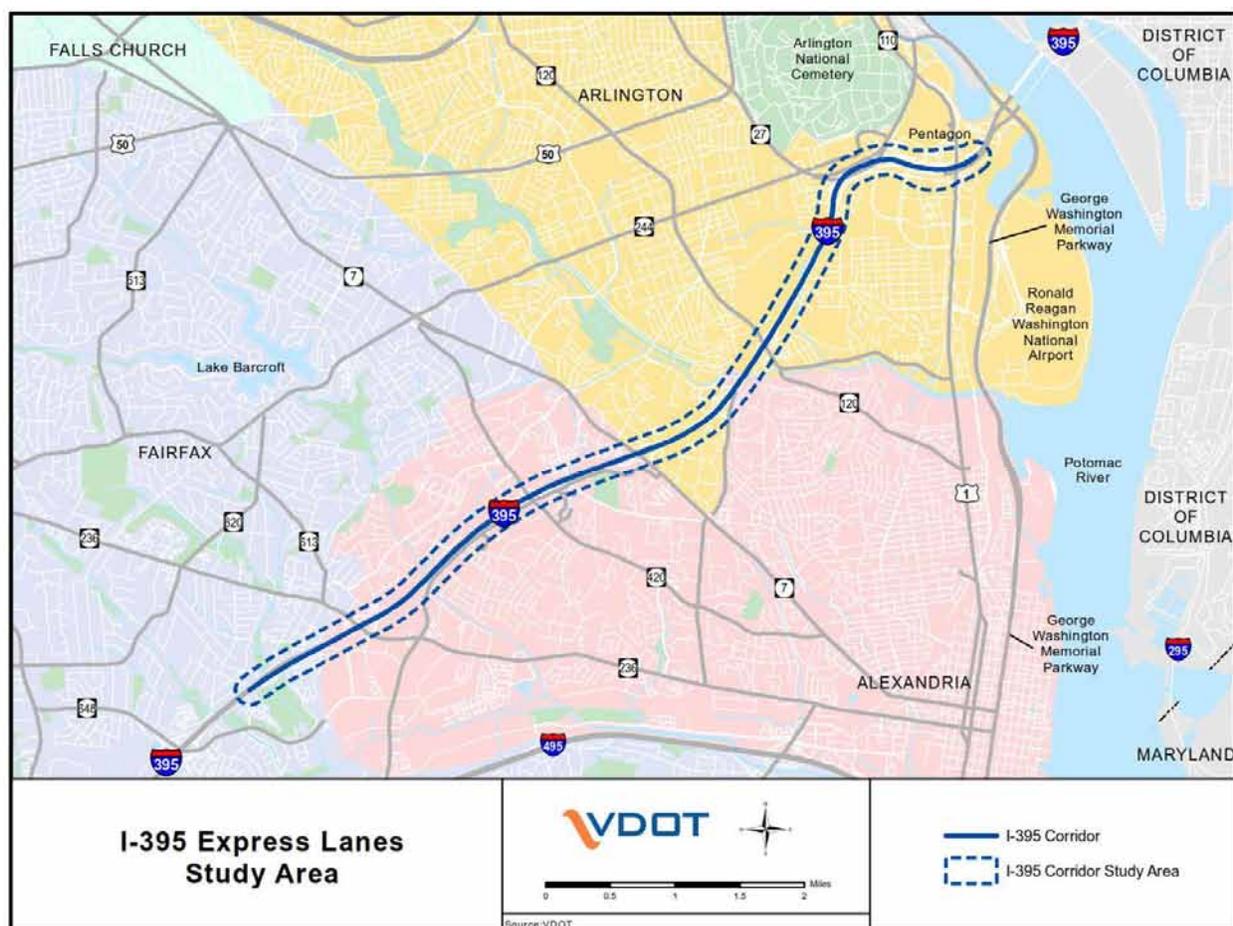
The study area encompasses approximately eight miles of the I-395 corridor from Turkeycock Run in Fairfax County to the vicinity of Eads Street near the Pentagon in Arlington County, as shown in **Figure 3-1**.

Transition areas extending slightly beyond these termini are included in order to connect the proposed improvements with the existing facility on either end. Additional signage, maintenance of traffic, and noise barrier activities are anticipated to occur beyond the study area. Crossroads and interchange areas also are included in the study area, as well as lands adjacent to the corridor⁸.

Potential or estimated environmental impacts of the Build Alternatives were estimated based on the Build Alternative's area of impact. The area of impact has been estimated for alternative comparison purposes and decision-making during the National Environmental Policy Act (NEPA) process, and would be refined as design advances.

⁸ The study area is approximately 600 feet to either side of the existing corridor for a distance of eight miles. The study area is established to identify the full extent of environmental resources and their relevance to the project.

Figure 3-1: Study Area



The specific alternative scenarios are the No Build Alternative which would retain the existing I-395 Interstate and associated interchanges in their present configurations, and allow for routine maintenance and safety upgrades, but assumes no major improvements to the I-395 corridor with the exception of the previously committed projects; and the Build Alternative which would extend eight miles along I-395 beginning at Turkeycock Run Interchange, just north of Edsall Road Interchange, to the vicinity of Eads Street Interchange and converts the two existing reversible High Occupancy Vehicle (HOV) lanes to three HOT lanes within the median area between the northbound and southbound I-395 general purpose lanes, as discussed in **Section 2.3.1, 2.3.2** and the *Alternative Analysis Technical Report* (VDOT, 2016a).

3.2 DEMOGRAPHICS/PROPERTY IMPACTS

3.2.1 Existing Conditions

There are over 73,000 residents within the Census block groups within the study area (Census, 2014). Between 1980 and 2014, Fairfax County has seen a larger percent change (87 percent) in total population than the state of Virginia (53 percent). The City of Alexandria has seen a 42 percent population increase and Arlington County a 44 percent population increase.

Fairfax County is the only study area locality to have a higher positive employment percent change (16 percent) than that of Virginia (12 percent), from 2001-2014. According to the Virginia Labor Market Information (LMI), the Professional, Scientific, and Technical Service industry ranks as the largest industry in Fairfax County, the City of Alexandria, and Arlington County with 26 percent, 24 percent, and 19 percent, respectively.

Within the study area Census block groups there is a higher percentage of renter occupied housing (65 to 69 percent) than owner occupied housing (31 to 35 percent) across all localities. The study area census block groups have an average of 12 percent vacant housing units. For more information regarding population, employment, and housing characteristics, refer to the *Socioeconomic Land Use and Technical Report* (VDOT, 2016i).

3.2.2 Future Conditions

No Build Alternative

Although the No Build Alternative would not improve travel through the study area, the lack of improvements would likely not cause people to relocate from the area, as discussed further in the *Indirect and Cumulative Effects Technical Report* (VDOT, 2016e). An additional evaluation of the study area's social characteristics may be required if any programmed improvements under the No Build Alternative involve major new construction with federal funding. These effects would be addressed by the respective project sponsors.

Build Alternative

In addition to reducing congestion and overall travel times in both the I-395 general purpose and HOV lanes during peak periods, the extension of the I-395 Express Lanes would increase roadway safety, provide additional travel choices, and improve travel reliability. The improvements would not likely cause people to relocate into or out of the area. Therefore, the Build Alternative would not materially affect population characteristics of the study area.

Construction of the Build Alternative would provide temporary local employment opportunities and support existing local businesses around the corridor (e.g., gas stations and restaurants).

The Build Alternative would be built largely within VDOT's existing right of way and would not result in any displacements or relocations. Noise barrier requirements and locations have not been set; however, minor right of way and/or easements may be necessary. Based upon preliminary design, approximately 5.06 acres may be required. Additionally, approximately 0.24 acres would be required for power, signal, and signage requirements. Further information regarding right of way and/or easements is included in the *Right of Way Technical Report* (VDOT, 2016h).

Since the Build Alternative would not negatively impact population, economic, housing characteristics, or cause displacements or relocations to uses within the study area, no mitigation measures are proposed. Refer to the *Socioeconomic and Land Use Technical Report* (VDOT, 2016i) for additional information.

3.3 ENVIRONMENTAL JUSTICE

3.3.1 Existing Conditions

Of the 45 Census block groups within the study area, 29 are determined to be Environmental Justice (EJ) communities based upon high percentages of minority persons (refer to **Figure 3-2**). A majority of the EJ Census block groups within the study area are generally located on the southwestern portion of the I-395 study area corridor in the City of Alexandria and Fairfax County.

None of the Census block groups within the study area have a median household income below \$23,850, the U.S. Department of Health and Human Services (HHS) 2014 poverty threshold for a family of four (the average household size within the localities within the study ranges between 2.20 and 2.83; therefore using the threshold for a family of four yields a conservative threshold). Thus, no low-income populations have been identified within the project study area and no further assessment of impacts to low-income populations is required.

3.3.2 Future Conditions

No Build Alternative

The No Build Alternative would not improve the travel time within the corridor; however, this delay in travel would be felt by all residents including minority populations and would not impact minority populations disproportionately. Evaluation of the potential effects to environmental justice communities may be required if programmed improvements under the No Build Alternative involve major new construction with federal funding. Potential effects to minority populations would be addressed by the respective project sponsors.

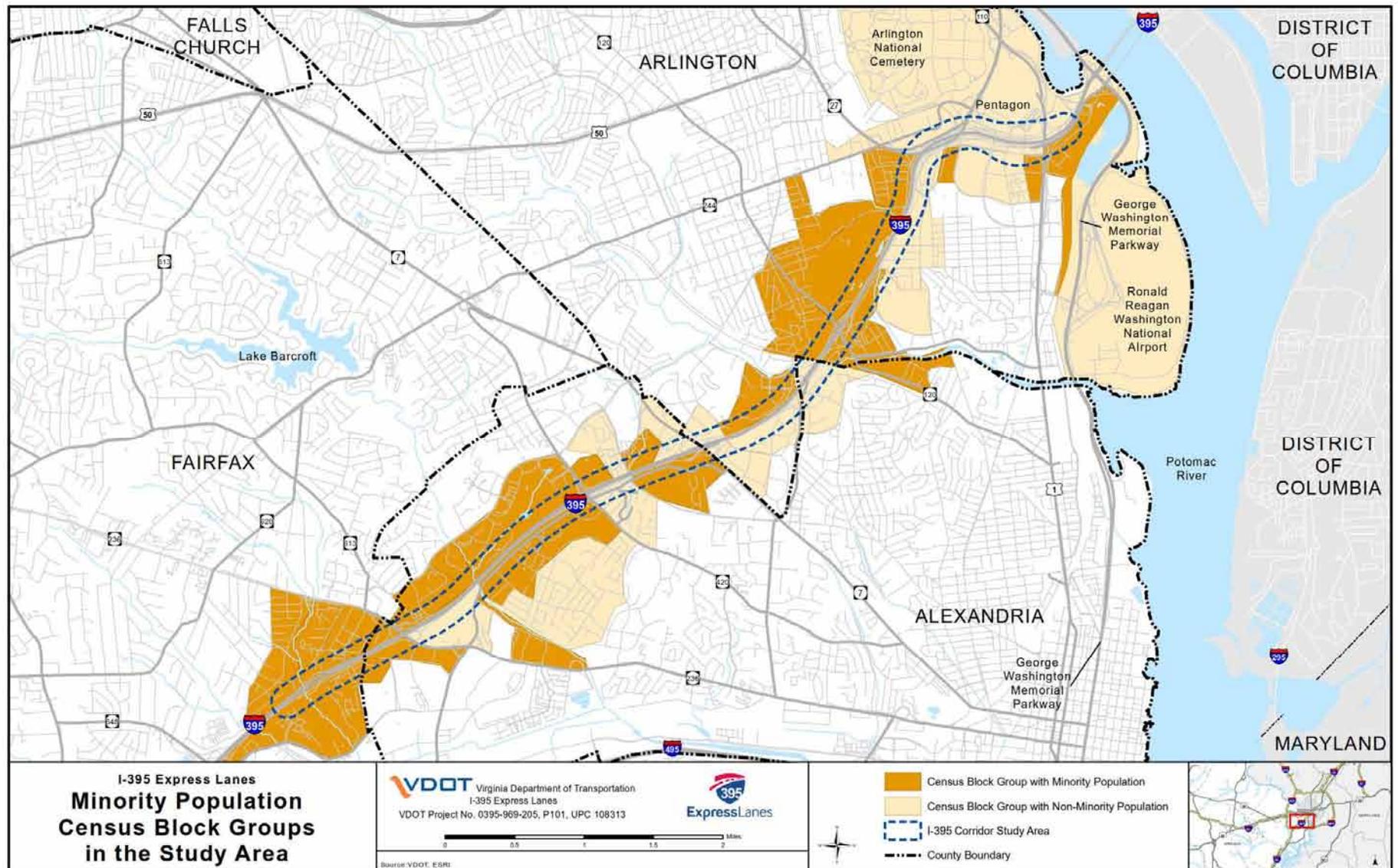
Build Alternative

The Build Alternative would reduce congestion and overall travel times in both the I-395 general purpose and HOV lanes during peak periods. The extension of the I-395 Express Lanes would increase roadway safety, provide additional travel choices, and improve travel reliability, providing benefits to all populations, including minority populations.

The Build Alternative would cause noise impacts to both non-minority and minority populations. In accordance with Federal Highway Administration (FHWA) Order 6640.23, consideration of mitigation for noise impacts (e.g., noise barriers) would be provided without discrimination when warranted and determined to be feasible and reasonable.

The Build Alternative would convert HOV lanes to HOT lanes, requiring that single-occupancy vehicles (SOV) and double occupancy vehicles pay a toll to use the express lanes. Other options are available to users to avoid the tolls associated with the HOT lanes that offer flexibility for all income levels, including the use of the existing general purpose lanes, the use of an E-ZPass Flex which would provide free access to the HOT lanes for carpoolers with three or more people in the vehicle, as well as transit. The FHWA has stated that congestion pricing “places responsibility for travel choices squarely in the hands of the individual traveler, where it can be decided and managed” (FHWA, 2008). While the SOV is often the preferred choice of travel, with increasing benefits to shared passenger transportation alternatives, travelers may decide to change their travel habits.

Figure 3-2: Environmental Justice Block Groups



Maintaining the general purpose lanes along with the HOT lanes allows each individual traveler to choose between the free lanes or the tolled facility based on the value that individual has placed on their time and/or the need for a reliable trip time. With the new cash-based system created by E-ZPass, families that previously could not obtain an E-ZPass transponder due to the lack of a credit card, can now purchase an E-ZPass Reload Card at local convenience stores, such as CVS and 7-11 (see <http://www.ezpassva.com/reloadcard> for more details). These additional options help ensure that low income drivers are not precluded from acquiring an E-ZPass and using the facility.

The impacts associated with the Build Alternative would not disproportionately impact minority or low-income populations. Project-related improvements to travel time and travel reliability would benefit both minority populations and non-minority populations. Therefore, no mitigation measures are proposed. Refer to the *Socioeconomic and Land Use Technical Report* (VDOT, 2016i) for additional information.

3.4 LAND USE AND PLANNED DEVELOPMENT

3.4.1 Existing Conditions

The study area is comprised mainly of highly developed urban areas and communities interspersed with parks and recreational uses. Development in the study area primarily consists of transportation, residential, and commercial properties, as listed in **Table 3-2** and shown in **Figure 3-3**.

Table 3-2: Summary of Study Area Land Use

Land Use	Acres	Percent of Study Area Covered
Commercial	100.13	8.9%
Industrial	16.02	1.4%
Institutional ¹	51.60	4.6%
Other ²	13.07	1.2%
Recreational	81.96	7.3%
Residential	363.25	32.4%
Transportation (including I-395)	495.33	44.2%

Source: Geographic Information Systems (GIS) and county data overlays

¹ Institutional land uses includes schools and religious facilities.

² Other land uses includes city-owned, open, vacant, or other public land.

3.4.2 Future Conditions

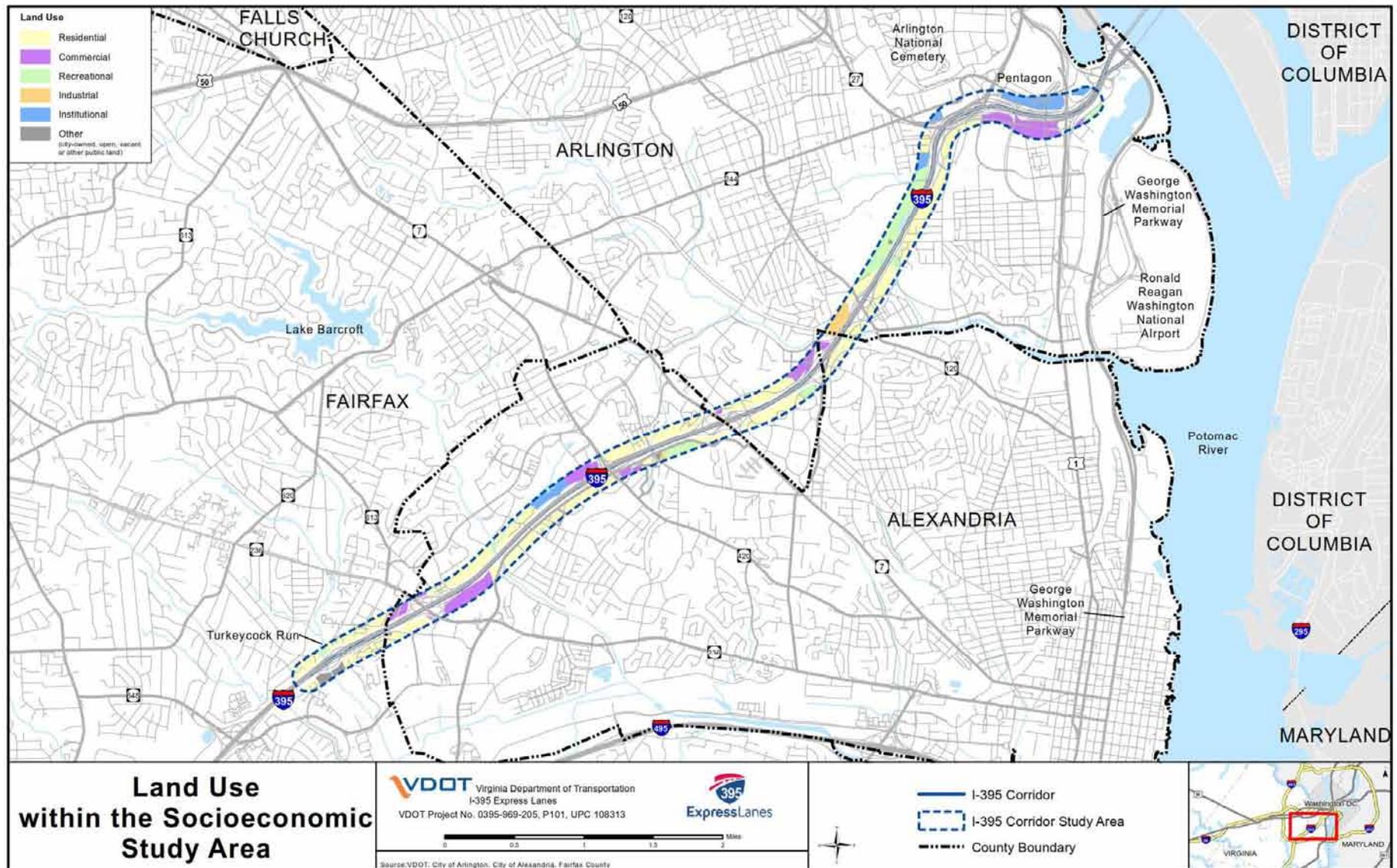
No Build Alternative

Each locality has plans for future development and redevelopment around the study area. These plans for development are not likely to change under the No Build Alternative. Evaluation of the potential effects to land use may be required if any programmed improvements under the No Build Alternative involve major new construction with federal funding. These effects would be addressed by the respective project sponsors.

Build Alternative

A commonly stated need for development within each locality is more efficient travel in either the form of better public transportation or improved highway corridors.

Figure 3-3: Land Use within the Study Area



The Build Alternative would reduce congestion and overall travel times in both the I-395 general purpose and HOV lanes during peak periods. The extension of the I-395 Express Lanes would increase roadway safety, provide additional travel choices, and improve travel reliability. These traffic improvements have the potential to aid each locality in future development goals by helping to provide faster more reliable commute times with improved travel times for emergency vehicles. The Build Alternative would have no substantial impacts to land use. Refer to the *Socioeconomics and Land Use Technical Report* (VDOT, 2016i) for additional information.

3.5 COMMUNITY FACILITIES

3.5.1 Existing Conditions

Community facilities are buildings or places that provide a variety of services to the public. Public community facilities generally provide services for general public benefit, and include public schools, healthcare facilities, emergency service facilities, government services, airports, and museums. Privately-held community facilities also serve as important institutions within the community, and include religious facilities, cemeteries, and private schools. The study area contains three religious facilities, one public and two private schools, one museum and visitor center, one fire station, one police station, one memorial and two post offices (refer to **Figure 3-4**). The majority of the community facilities are located in Arlington's portion of the study area.

Public transportation systems within the study area include the Metrorail, multiple bus systems, owned by Metrorail, the state or by a locality. Additionally, the Virginia Railway Express runs south of the study area along I-495 with a stop near the Van Dorn Metrorail stop. Refer to the *Socioeconomic and Land Use Technical Report* (VDOT, 2016i) for additional information.

3.5.2 Future Conditions

No Build Alternative

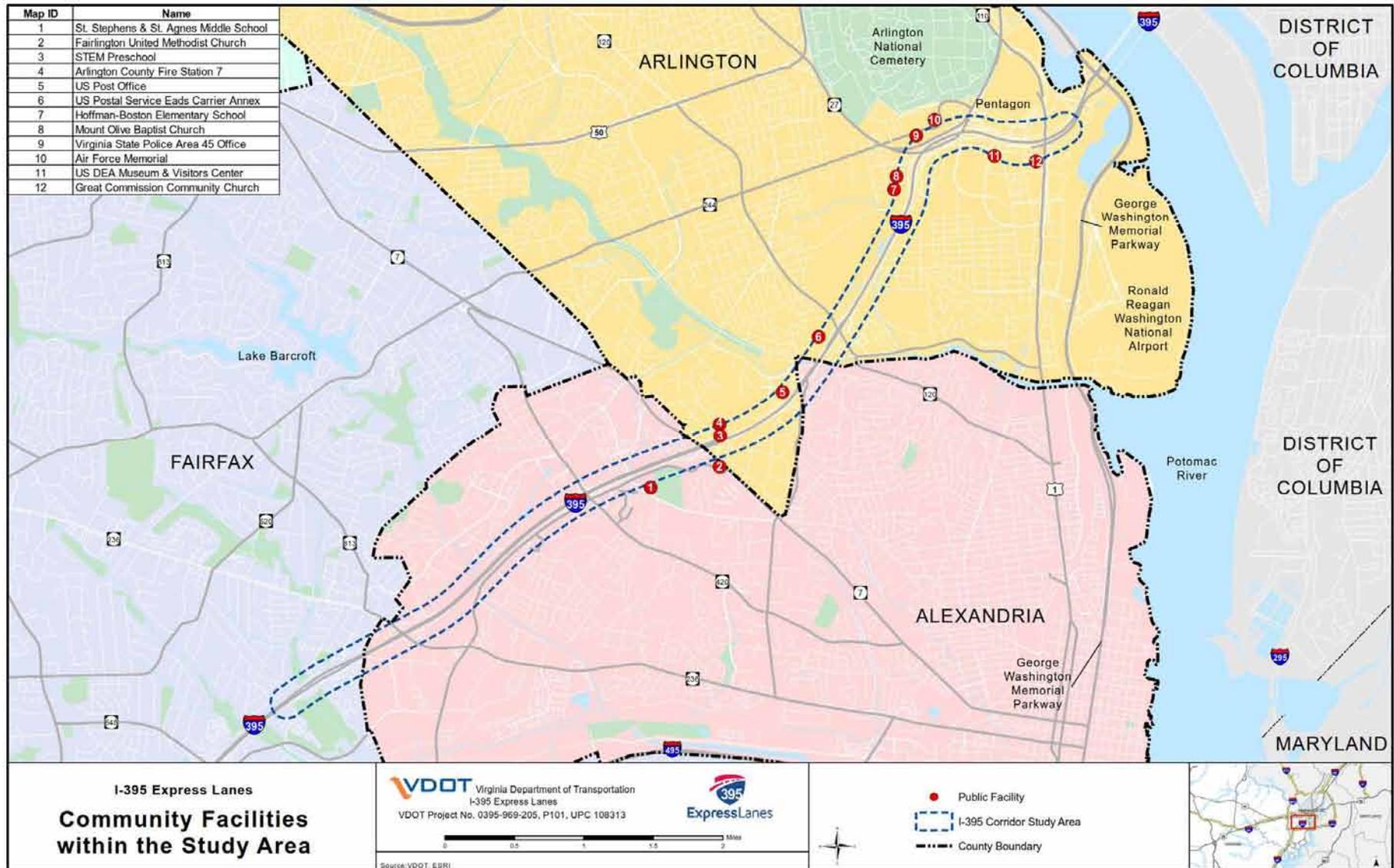
Under the No Build Alternative, travel patterns and access along the I-395 study area would not be improved and travel times for emergency services may be less reliable. Evaluation of the potential effects to community facilities may be required if any programmed improvements under the No Build Alternative involve major new construction with federal funding. These effects would be addressed by the respective project sponsors.

Build Alternative

Implementation of the Build Alternative would reduce congestion and overall travel times in both the I-395 general purpose and HOV lanes during peak periods. The extension of the I-395 Express Lanes would increase roadway safety, provide additional travel choices, and improve travel reliability, which would likely increase reliability for emergency services.

The Build Alternative would have no substantial impacts to community facilities; therefore, no mitigation is required. Refer to the *Socioeconomic and Land Use Technical Report* (VDOT, 2016i) for additional information.

Figure 3-4: Community Facilities within the Study Area



3.6 RECREATIONAL RESOURCES

3.6.1 Existing Conditions

For purposes of the study, recreational resources have been identified as any protected area under the jurisdiction of a municipal, state, federal, or conservation entity; or a public area where recreation or preservation is a primary function or resource. A total of fifteen recreational resources are located within the study area. Three parks are located within the City of Fairfax; four parks (one of which is also a museum – the Fort Ward Museum and Park) and two conservation easements are located within the City of Alexandria; and four parks, and a community center are located within Arlington County. The Washington-Rochambeau Revolutionary Route, a National Park Service (NPS) National Historic Trail, also passes through the City of Alexandria and Arlington County. These resources are shown in **Figure 3-5**.

3.6.2 Future Conditions

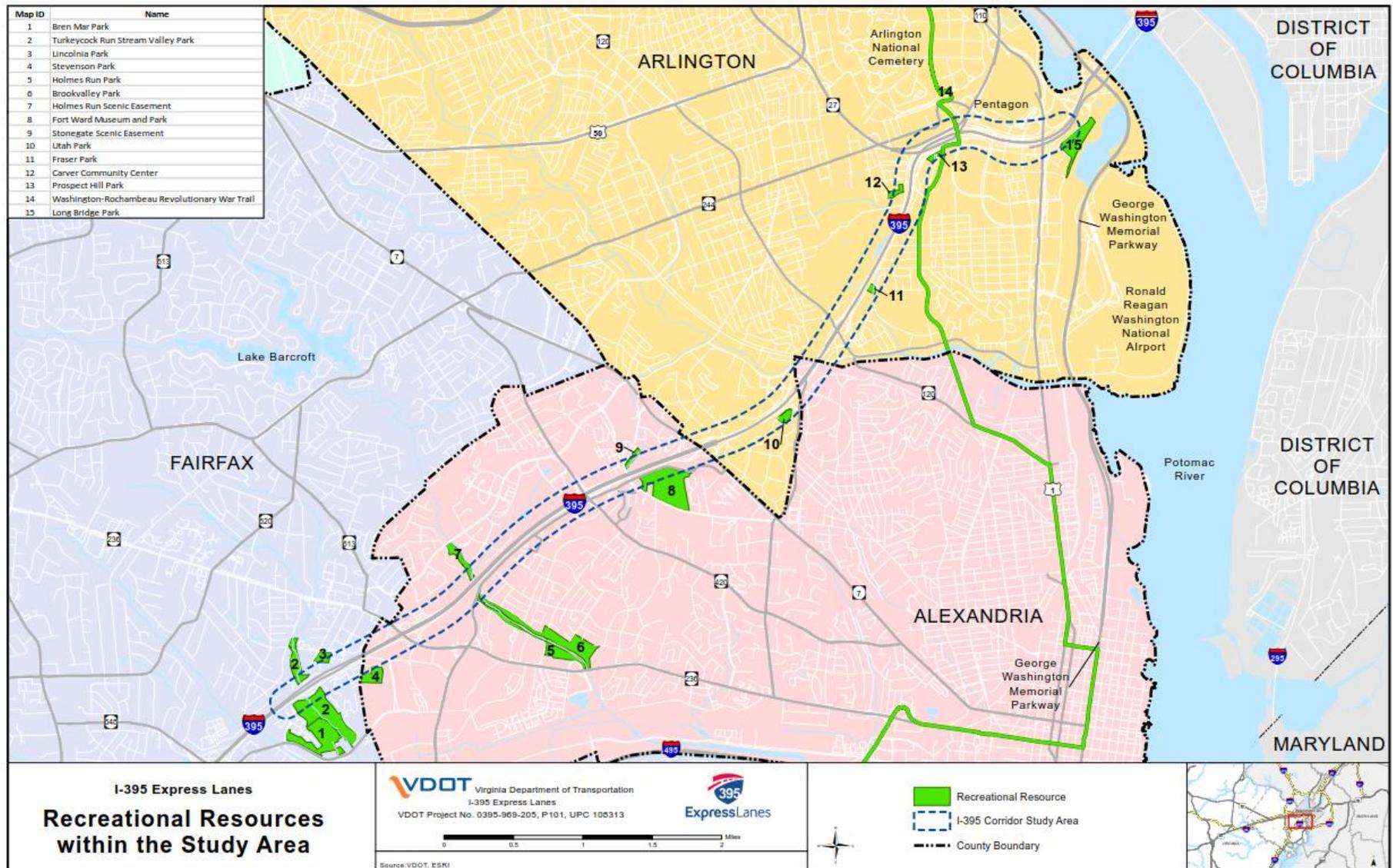
No Build Alternative

Noise impacts are predicted to occur at portions of five recreational resources under the No Build Alternative. Additionally, evaluation of the potential effects to recreational resources may be required if any programmed improvements under the No Build Alternative involve major new construction with federal funding. These effects would be addressed by the respective project sponsors.

Build Alternative

Noise impacts are predicted to occur at portions of five recreational resources under the Build Alternative; however none of these impacts would be considered a constructive use under Section 4(f). The number of noise impacts are predicted to increase under the Build Alternative compared to the No Build Alternative, and potential noise mitigation is under consideration for the Build Alternative (see **Section 3.9** and refer to the *Noise Analysis Technical Report* (VDOT, 2016g). Indirect impacts, such as increased traffic volumes may be experienced by recreational resources within the study area. Additionally, the Build Alternative would reduce congestion and overall travel times in both the I-395 general purpose and HOV lanes during peak periods. The extension of the I-395 Express Lanes would increase roadway safety, provide additional travel choices, and improve travel reliability, which may contribute to an increased usage of recreational facilities as some members of the community may find that traveling to the facilities is easier. Since no recreational resources would be substantially impacted by the project, no additional mitigation is proposed outside of the consideration of potential noise barriers. Additional information on recreational resources is provided in the *Socioeconomic and Land Use Technical Report* (VDOT, 2016i).

Figure 3-5: Recreational Resources within the Study Area



3.7 CULTURAL RESOURCES

3.7.1 Existing Conditions

An archaeological and architectural reconnaissance survey was completed to determine the presence of resources in the area of potential effect (APE). Four known historic properties were identified in the vicinity of the APE: the Pentagon (000-0072), the Alexandria Canal Path (44AX0028), Parkfairfax Historic District (100-0151), and the Fairlington Historic District (000-5772) (refer to **Figure 3-6**)⁹.

Five previously-recorded archaeological sites (44AX0028, 44FX2214, 44AX0037, 44AX0176, and 44AX0177) and one newly-recorded archaeological site (44FX3210) are within the project APE. The five previously recorded sites were found to be destroyed within the APE, and site 44FX3210 was determined not eligible for listing in the National Register of Historic Places (NRHP).

An additional five historic resources were identified as being proximate to the project by Arlington County: the Fraser Family Cemetery, the Remains of Fort Richardson, the Civil War Camp Convalescent, the former location of Fort Albany, and the Washington-Rochambeau Revolutionary War Trail. The Fraser Family Cemetery, the Remains of Fort Richardson, the Civil War Camp Convalescent and the Washington-Rochambeau Revolutionary War Trail are not anticipated to be impacted by the proposed improvements. Therefore, no additional coordination is required at this time. If proposed improvements necessitate the need for additional right of way in the vicinity of these resources, VDOT will coordinate with VDHR during final design. VDOT has conducted a Phase 1 study of the former location of Fort Albany, which included historical research and shovel tests of accessible areas within VDOT's right of way. The results indicate that the former location of Fort Albany has been destroyed within the APE; therefore, no additional coordination is required at this time.

3.7.2 Future Conditions

No Build Alternative

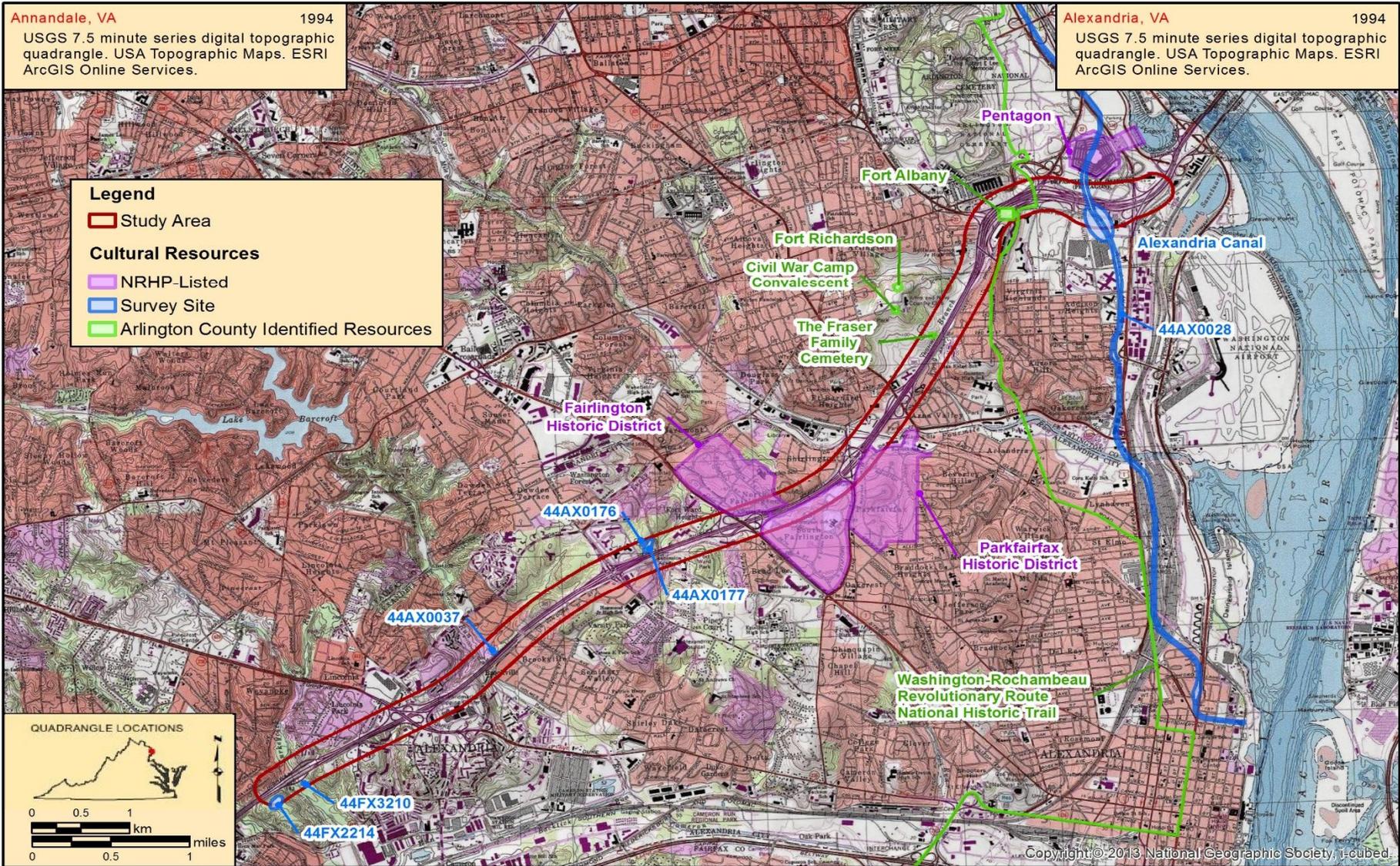
The No Build Alternative would have no direct impact on historic resources. An additional evaluation of the study area's cultural resources may be required if any programmed improvements under the No Build Alternative involve major new construction with federal funding. These effects would be addressed by the respective project sponsors.

Build Alternative

The Build Alternative would not affect any NRHP-eligible archaeological sites and would have No Effect on the Pentagon and the Alexandria Canal Path. However, since the Fairlington and Parkfairfax Historic Districts are adjacent to the Interstate, there is potential for visual effects to the districts. Additionally, minor right of way and/or easements could be required for the construction of noise barriers.

⁹ Additional resources were surveyed and identified by others after the cultural resources analysis for this EA was completed. To be conservative, the potential impacts associated with these historic properties have been included in this EA. Additional coordination with VDHR and DC SHPO will be conducted based on further design when more detail is available regarding the need for and design of noise barriers in the vicinity of the historic resources.

Figure 3-6: Cultural Resources within the Study Area



Based upon preliminary design, the Build Alternative could impact up to approximately 5.91 acres of historic resource property for the construction of noise barriers. As currently proposed, the project would not impact any of the qualities that make the historic resources eligible for listing in the NRHP.

Approximately 2.41 acres would be outside of the VDOT right of way and would be located within historic districts (3.5 acres of potential impact are within VDOT right of way). This estimate is based on a conservative estimate of the right of way width required to construct and maintain the barriers (approximately 30 feet). During the final design noise analysis, barrier locations would be refined and may be shifted to be fully located within the VDOT right of way. VDHR and the DC SHPO have reviewed the undertaking within VDOT right of way in accordance with the NHPA and determined that the project will have a No Adverse Effect on historic properties. Additional coordination with VDHR and the DC SHPO will be conducted based on further design details.

3.8 AIR QUALITY

This section describes the current regulations pertaining to the control of air pollutants, the pollutants of concern, and the effect of the Build Alternative on air quality both during operation of the project and during construction. For further details, refer to the *Air Quality Technical Report* (VDOT, 2016a).

3.8.1 Existing Conditions

Pursuant to the Federal Clean Air Act of 1970 (CAA), the EPA is required to set the NAAQS for pollutants considered harmful to public health and welfare. Federal actions must not cause or contribute to any new violation of any standard, increase the frequency or severity of any existing violation, or delay timely attainment of any standard or required interim milestone.

EPA designates geographic regions that do not meet the NAAQS for one or more criteria pollutants as “non-attainment areas.” Areas previously designated as non-attainment, but subsequently re-designated to attainment because they no longer violate the NAAQS, are reclassified as “maintenance areas” subject to maintenance plans to be developed and included in a State’s Implementation Plan (SIP). This project is located within areas (Fairfax and Arlington Counties, and the City of Alexandria) that are part of a region currently designated non-attainment or maintenance for one or more of the NAAQS established by the EPA, as follows:

- DC-Maryland-Virginia marginal nonattainment area for the 2008 eight-hour ozone standard, and
- DC-Maryland-Virginia maintenance area for the 1997 primary annual fine particulate matter (PM_{2.5}) NAAQS¹⁰.

As such, federal transportation conformity rule (40 CFR Parts 51 and 93) requirements apply.

In addition, FHWA requires that the project’s effect on carbon monoxide (CO) and mobile source air toxics (MSATs) be assessed, either qualitatively or quantitatively, depending upon the type of project.

¹⁰ On August 24, 2016, EPA issued a final rule (81 FR 58010) titled “*Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements*” that included a revocation of the 1997 primary annual PM_{2.5} standard effective October 24, 2016, and therefore federal transportation conformity requirements pertaining to PM_{2.5} will no longer apply after that date in the DC-Maryland-Virginia maintenance area.

3.8.2 Future Conditions

No Build Alternative

Transportation Conformity

Since the No Build Alternative does not plan any new construction, the alternative would be in conformance with the National Capital Region Transportation Planning Board's (NCRTPB) Constrained Long Range Plan (CLRP) and associated Transportation Improvement Program (TIP), and the associated regional conformity analysis.

PM_{2.5} Analysis

As discussed below under the Build Alternative, the proposed improvements were not found to be ones of air quality concern for PM_{2.5}, and therefore a detailed quantitative assessment of potential impacts associated with the No Build Alternative was not required.

CO Analysis

While the No Build Alternative would result in increased traffic along local roadways, no assessment was performed due to the FHWA-VDOT 2009 Agreement for No Build Analyses, which states that if the project qualifies as an EA, an analysis of CO is not required. This agreement is based upon FHWA's and VDOT's review of numerous air studies on similar projects that concluded that CO is not anticipated to be adversely affected in the No Build condition, and therefore yields little or no value to the public and does not aid in decision-making.

MSAT Analysis

The effect on MSATs was assessed qualitatively. Since the EPA's vehicle and fuel regulations are expected to result in substantially lower MSAT levels in the future than exist today due to cleaner engine standards coupled with fleet turnover, the MSAT emissions in the study area would be substantially lower under the No Build Alternative than they are today, even accounting for vehicle miles traveled (VMT) growth.

Construction Emissions

Since the No Build Alternative does not plan any new construction, the alternative would not produce any construction emissions.

Build Alternative

Transportation Conformity

The I-395 Express Lanes Project has been included in the 2016 CLRP Amendment and the FY2017-2022 TIP and has been found to conform to all requirements of the Clean Air Act Amendments of 1990 by the NCRTPB. The Amendment was adopted by the TPB at its regular meeting on November 16, 2016, and is currently awaiting Federal approval.

PM_{2.5} Analysis

For PM_{2.5}, the screening criteria presented in **Appendix L** of the *VDOT Project-Level Air Quality Resource Document (Resource Document)* (VDOT, 2016k), which were established based on EPA guidance and subjected to interagency consultation for conformity, were applied to determine if this project represents one of local air quality concern. Traffic forecasts developed for this project showed that increases in average daily diesel truck traffic associated with the Build Alternative would not exceed 2,000 trucks per day, the criterion established in the *VDOT Resource Document* (VDOT, 2016k) for highway capacity expansion. Additional factors that support the conclusion that this project is not one of local air quality concern for PM_{2.5} include:

- Mainline capacity increases usable by trucks are not part of the proposed action;
- The area has already achieved the 1997, 2006 and 2012 PM_{2.5} NAAQS;
- Background concentrations are well below the 1997 NAAQS (8.8 – 9.4 ppb); and,
- On August 24, 2016, EPA issued a final rule (81 FR 58010), effective October 24, 2016, on “*Fine Particulate Matter National Ambient Air Quality Standards: State Implementation Plan Requirements*” that revoked the 1997 primary annual PM_{2.5} standard for areas designated as attainment for that 2012 PM_{2.5} standard. As a result, conformity requirements pertaining to PM_{2.5} no longer apply to the project area.

Based on the weight of evidence it was determined that the proposed improvements are not ones of air quality concern for PM_{2.5} and therefore a detailed quantitative assessment of potential impacts was not required.

CO Analysis

A quantitative CO hot spot worst-case screening analysis was performed for the project for purposes of both conformity and NEPA, using inputs and procedures specified in the *VDOT Resource Document* (VDOT, 2016k) and consistent with applicable EPA and FHWA requirements and guidance. The analysis was conducted as follows:

- Modeling was completed for existing (2015), the project opening (2020) and design (2040) years.
- The modeling was conducted with EPA models for emissions and dispersion.
- Analysis was conducted for three highly congested major intersections (Little River Turnpike and Beaugard Street, Seminary Road and Beaugard St EB, S. Glebe Road and NB I-395 Off-ramp) and the interchange between I-395 & Route 27.
- Based on the FHWA-VDOT 2016 Programmatic Agreement, only Seminary Road and Beaugard Street EB required detailed modeling.
- Modeling in all cases was conducted using worst-case assumptions for traffic and facility configurations. For example, at the interchange, worst-case traffic volumes were applied, traffic and emissions were concentrated into a single grade separation rather than modeled over broadly dispersed ramps, and receptors were located at twenty feet from the edge of the travelled roadways rather than outside the right of way limits that are outside the footprint of the interchange and therefore much further away from the modeled roadway.

The results for all of the analyses (intersection and interchange) show that CO concentrations for the Build Alternative are expected to remain well below the CO NAAQS for all locations modeled throughout the

corridor for each year modeled. Based on the modeling results, implementation of the project is not expected to cause or contribute to a violation of the CO NAAQS.

MSAT Analysis

Based on FHWA guidance and the forecast total traffic volumes for I-395, this project is categorized as one with high potential effects for MSATs. A detailed quantitative assessment (modeling) following FHWA guidance was therefore conducted for the project to assess the potential impacts for MSATs. The assessment shows that there would be no long-term adverse impacts associated with the Build Alternative and that future MSAT emissions across the entire study corridor would be substantially below today's levels, even after accounting for projected VMT growth.

More specifically, the modeling results indicate that MSAT emissions are expected to increase slightly from the No Build to the Build Alternative in 2020 and 2040, although these increases are not substantial. However, when compared to existing conditions, emissions of all MSAT pollutants under the Build Alternative are projected to be substantially lower than exist today. EPA's stringent vehicle emission and fuel regulations, combined with fleet turnover, are expected to substantially lower fleet-average emission rates for MSATs in the future relative to today.

Overall, best available information indicates that, nationwide, regional levels of MSATs are expected to decrease in the future due to fleet turnover and the continued implementation of more stringent emission and fuel quality regulations. Nevertheless, it is possible that some localized areas will show an increase in emissions and ambient levels of these pollutants due to locally increased traffic levels associated with the project.

Construction Emissions

The temporary air quality impacts from construction are not expected to be substantial. Emissions will be produced during the construction of this project by heavy equipment and vehicle travel to and from the site. Earthmoving and ground-disturbing operations will generate airborne dust. Construction emissions are short term or temporary in nature. In order to reduce these emissions, all construction activities are to be performed in accordance with VDOT's current Road and Bridge Specifications. These specifications require compliance with all applicable local, state, and federal regulations.

3.9 NOISE

3.9.1 Existing Conditions

A noise analysis was performed in accordance with current FHWA regulations contained in 23 CFR 772 and VDOT's Noise Abatement Policy. For more information regarding noise analysis results, refer to the *Noise Analysis Technical Report* (VDOT, 2016g).

Noise monitoring was conducted at 29 sites during the time period from May 23 to 26, 2016 to characterize noise levels associated with contemporaneous traffic counts conducted in the study area. The average sound level (L_{eq}) ranged from a low of 57 decibels (dBA) at Fort Ward Park, 4301 West Braddock Road, Alexandria to a high of 74 dBA at 2300 24th Road, Arlington.

FHWA's noise-prediction computer model (TNM) was then used to develop a model of the study area which was validated for accuracy with the results of the noise monitoring program. Using the loudest-hour traffic data (determined to be 7:00 a.m. to 8:00 a.m. for Existing Conditions), existing traffic noise levels were predicted for sites representative of all noise sensitive land-users (or receptors) throughout the study area. The predicted existing noise levels are then used as the baseline against which forecasted build year noise levels are compared and potential noise impacts assessed. In addition to the increase in noise levels from existing year to build year, noise impacts are identified where noise sensitive land uses exceed the FHWA Noise Abatement Criteria (NAC). Overall, predicted outdoor noise levels range from 44 to 79 dBA L_{eq} for Existing Conditions. A total of 2,274 residential, one commercial, and 225 recreational receptors have noise levels that approach or exceed the NAC. The NAC is 67 dBA L_{eq} at all residential and recreational receptors and 72 dBA L_{eq} at all commercial receptors.

3.9.2 Future Conditions

No Build Alternative

The loudest-hour of the day for the No Build Alternative was determined to be 5:00 p.m. to 6:00 p.m. Overall, predicted future design year No Build exterior noise levels range from 44 to 79 dBA L_{eq} . No Build sound levels are predicted to remain approximately the same or very slightly lower during the loudest-hour of the day relative to the existing levels. This is due to increased traffic congestion predicted during the loudest-hour travel periods slowing speeds. A total of 2,201 residential, 217 recreational, and one commercial receptors were above the NAC.

Build Alternative

The loudest-hour of the day for the Build Alternative was determined to be 8:00 a.m. to 9:00 a.m. Predicted 2040 Build Alternative exterior L_{eq} s are slightly higher than the Existing and No Build levels, and range from 45 to 80 dBA. On average for all receptors, sound levels are predicted to increase from Existing to Build conditions by approximately one dBA. This increase is due primarily to the roadway improvements allowing slightly higher traffic volumes in the loudest-hour periods. A total of 2,600 residential, 256 recreational, and one commercial receptors were above the NAC.

Noise impact would occur wherever project noise levels are expected to approach within one dBA or exceed the NAC or when project noise levels cause a substantial increase over existing year noise levels – an increase of 10 dBA or more is considered substantial by VDOT. There are no impacts predicted due to substantial increases in existing noise levels for the I-395 Express Lanes project.

FHWA and VDOT require that noise barriers be both “feasible” and “reasonable” to be recommended for construction. To be feasible, a barrier must reduce noise levels at noise sensitive locations by at least five dBA, thereby “benefiting” the property. VDOT requires that at least 50 percent of the impacted receptors receive five dBA or more of noise reduction from the proposed barrier. Additionally, constructability issues must be assessed, such as safety, barrier height, topography, drainage, utilities, maintenance of the barrier, and access to adjacent properties. In addition to any potential engineering conflicts that are evaluated, VDOT's noise policy states that noise barrier panels cannot exceed the maximum allowable panel height of 30 feet.

Barrier reasonableness is based on three factors: cost-effectiveness, ability to achieve VDOT's noise reduction design goal, and voting results of the benefited receptors. To be “cost-effective,” a barrier's

surface area cannot exceed 1,600 square feet per benefited receptor. All receptors located above the barrier maximum height of 30 feet are not assessed or included in the determination of a barrier's feasibility or reasonableness. The second reasonableness criterion is the ability to achieve VDOT's noise reduction design goal of seven dBA for at least one of the impacted receptors. The third reasonableness criterion requires that a majority of the benefited receptors (owners and residents of the potentially benefited properties) vote in favor of the barrier for it to be considered reasonable to construct. In order to assess community views, a survey of benefited receptors would be conducted during the final design phase.

Noise barriers were evaluated for all areas where noise impacts were predicted. **Table 3-3** summarizes the total length, estimated cost and benefits that would be provided by the barriers evaluated that were found to be warranted, feasible and reasonable. The barriers that were found to be feasible and reasonable are shown in **Figure 3-7**. **Table 3-4** summarizes the details of all the barriers that were evaluated. A final decision on the feasibility and reasonableness of noise barriers would be made during the final design noise analysis phase of the project when finalized project design and detailed traffic is developed.

Table 3-3: Summary of Feasible and Reasonable Noise Barriers

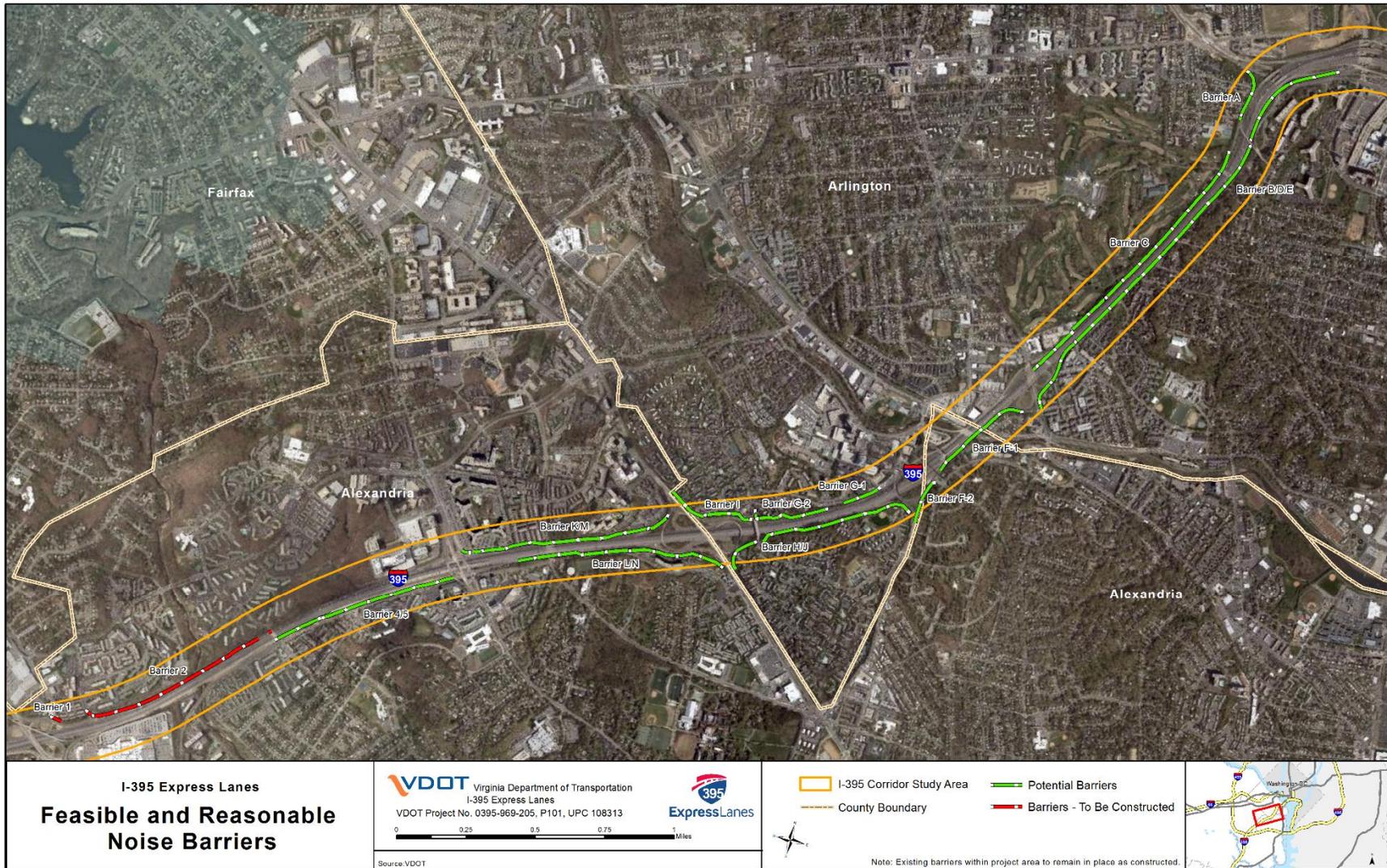
Location	Length (mi.)	Estimated Cost (\$31/sq. ft.)	Number of Benefited Receptors*		
			Impacted	Not Impacted	Total
West of I-395	3.7	\$11 million	967	1,157	2,124
East of I-395	4.4	\$17 million	1,060	1,469	2,529
All	8.1	\$28 million	2,027	2,626	4,653

** The number of benefits associated with Barriers 1 and 2 are not reflected in these totals as these barriers were previously evaluated under the I-395 HOV Ramp and Auxiliary Lane Project.*

Table 3-4: Summary of Noise Barrier Details

Barrier ID	Length (feet)	Height Range (feet)	Surface Area (square feet [SF])	Cost at \$31/SF	Barrier Surface Area per Benefited Receptor ¹ (SF/BR)	Barrier Status ²
1	243	18-23	5,173	\$160,363	235	F&R*
2	4,557	12-20	65,631	\$2,034,561	128	F&R*
A	1,044	15-24	20,632	\$639,592	625	F&R
B/D/E	8,875	21-30	242,319	\$7,511,889	178	F&R
C	5,636	18-24	103,712	\$3,215,072	319	F&R
CA	450	15	6,750	\$209,250	6750	F&NR
F-1	1,905	18-24	43,798	\$1,357,738	203	F&R
F-2	903	18-21	18,138	\$562,278	302	F&R
FA	1,037	24	24,907	\$772,117	4981	F&NR
G-1	773	21	16,221	\$502,851	147	F&R
G-2	1,569	15-24	30,438	\$943,578	483	F&R
H/J	3,816	27-30	109,541	\$3,395,771	413	F&R
I	1,755	27-30	50,541	\$1,566,771	337	F&R
K/M	4,073	15-18	66,581	\$2,072,381	74	F&R
L/N	4,010	15-27	79,491	\$2,464,221	235	F&R
4/5 ³	3,687	15-20	57,224	\$1,773,944	199	F&R
<p>¹ Where SF/BR exceeds VDOT's maximum of 1,600 SF, a barrier would not be considered cost-reasonable</p> <p>² Barrier Status: Feasible and Reasonable (F & R); Feasible and Not Reasonable (F & NR); and Not Feasible (NF)</p> <p>³ This barrier was found to be F & R in the I-395 HOV Ramp and Auxiliary Lane Project.</p> <p>*Barriers 1 and 2 from the I-395 HOV Ramp and Auxiliary Lane Project, are to be constructed as part of the I-395 Express Lanes Project.</p>						

Figure 3-7: Potentially Feasible and Reasonable Noise Barriers



This noise evaluation is preliminary; a more detailed review would be completed during final design. As such, noise barriers that are found to be feasible and reasonable during the preliminary noise analysis may not be found to be feasible and reasonable during the final design noise analysis. Similarly, noise barriers that were not considered feasible and reasonable may be found to meet established criteria and be recommended for construction. If a noise barrier is determined to be feasible and reasonable in final design, only the receptors that are benefited by the proposed barrier would be given an opportunity to vote whether construction of the noise barrier is wanted.

Construction activity may cause intermittent fluctuations in noise levels. During the construction phase of the project, all reasonable measures would be taken to minimize noise impact from these activities.

3.10 WETLANDS AND STREAMS

3.10.1 Existing Conditions

The study area is located within the Middle Potomac-Anacostia-Occoquan subbasin, the Potomac River-Rock Creek and Potomac River-Cameron Run watersheds, and the Potomac River-Pimmit Run, Potomac River-Fourmile Run, and Cameron Run subwatersheds.

Various named and unnamed streams exist in the study area. Four named perennial streams pass beneath I-395 along the project length: Four Mile Run, Turkeycock Run, Holmes Run, and Long Branch. All streams and natural drainage features ultimately flow to the Potomac River. Four Mile Run and Turkeycock Run are the two longest and most prominent stream courses in the study area.

3.10.2 Future Conditions

No Build Alternative

Under the No Build Alternative, there would be no new stream or wetland impacts anticipated as a result of Interstate improvements in the study area. An additional evaluation of the study area's wetlands and streams may be required if any programmed improvements under the No Build Alternative involve major new construction with federal funding. These effects would be addressed by the respective project sponsors.

Build Alternative

While the roadway would not impact any streams or wetlands, the noise barrier installation, located on the east side of I-395 just north of Route 7, is anticipated to impact approximately 0.004 acres of wetland (refer to **Figure 3-8**).

Additionally, all construction segments would be refined as much as practicable to lessen impacts to wetlands while meeting noise attenuation goals. The use of retaining walls and side slopes would be considered to avoid impacts from lateral encroachment. Compensation for any unavoidable impacts to wetlands would be provided through mitigation banking credits based on approval of permitting agencies. For additional information, refer to the *Natural Resources Technical Report* (VDOT, 2016f)¹¹.

¹¹ The USACE provided original jurisdictional determination (JD) May 28, 2008 for the boundaries of wetland and WOUS. (See also **Appendix B: Correspondence** for USACE re-verification correspondence letter).

Figure 3-8: Wetland Impacts



3.11 WATER QUALITY

3.11.1 Existing Conditions

When surface waters fail to meet water quality standards sufficient to support designated use categories, the waters are classified as “impaired waters” under Section 303(d) of the Clean Water Act (CWA). Of the four named perennial streams within the study area, three are classified as impaired: Holmes Run is impaired due to E. coli and has an impaired benthic-macroinvertebrate community, and Long Branch and the non-tidal portion of Four-Mile Run are impaired due to E. coli (VDEQ, 2016). The fourth named perennial stream, Turkeycock Run, is designated as fully supporting one or more designated use categories.

3.11.2 Future Conditions

No Build Alternative

Under the No Build Alternative, no water quality changes are anticipated as a result of Interstate improvements in the study area. An additional evaluation of the study area’s water quality may be required if any programmed improvements under the No Build Alternative involve major new construction with federal funding. These effects would be addressed by the respective project sponsors.

Build Alternative

Temporary impacts to water quality may occur during roadway construction activities through increased sedimentation from land disturbing activities and occurrences of fuel spills or hydraulic spills from construction equipment. During construction, the contractor would adhere to standard erosion and sediment control. Since this project was approved by Virginia Department of Environmental Quality (VDEQ) for stormwater grandfathering under the Part C II technical criteria of 9VAC25-870-93, the contractor would adhere to stormwater criteria prescribed in the regulations preceding July 2014.

Under the Build Alternative, stormwater management for the majority of the project would be accounted for through the purchase of nutrient credits. However, the portion of the project on the Pentagon Reservation will be required to comply with the Washington Headquarters Services Municipal Separate Storm Sewer System (MS4) permit. The total phosphorous removal requirement per VDOT Method IIC Performance Based calculations is less than ten pounds per year and therefore the project is eligible to purchase the entire amount of nutrient credits in lieu of constructing best management practice (BMP) stormwater management (SWM) facilities, in accordance with the Virginia Department of Conservation and Recreation (VDCR) requirements. For additional information, refer to the *Natural Resources Technical Report* (VDOT, 2016f).

3.12 FLOODPLAINS

3.12.1 Existing Conditions

Based on the FEMA Flood Boundary and Floodway maps, the FEMA regulated floodplains within the study area are along Four Mile Run, Turkeycock Run, and Holmes Run. In the past, these floodplains experienced a relatively high level of development encroachment, but are now generally well protected by

federal, state, and local regulations. The estimated floodplain acreage in the study area is 46 acres of 100-year floodplains and 43 acres of 500-year floodplains (refer to **Figure 3-9**).

3.12.2 Future Conditions

No Build Alternative

Under the No Build Alternative, no floodplain changes are anticipated as a result of Interstate improvements in the study area. An additional evaluation of the study area's floodplains may be required if any programmed improvements under the No Build Alternative involve major new construction, that is not currently anticipated, with federal funding. These effects would be addressed by the respective project sponsors.

Build Alternative

While the roadway would not encroach into floodplains or floodways, noise barriers have the potential to impact 0.09 acres of 100-year floodplains and 0.01 acres of 500-year floodplains. As the design of the noise barriers advances to more detailed design, continued focus would be on avoiding and minimizing floodplain encroachment to ensure that the Build Alternative meets the goals of Executive Order 11998, as amended, Executive Order 13690, and FHWA policy as set forth in 23 CFR 650. During final design, a hydrologic and hydraulic analysis would be required to evaluate the effect of the proposed roadway improvements on stormwater discharge. The results of the study would be used to provide adequate design of the hydraulic opening and proper conveyance of floodwaters to minimize impacts to the floodplain. For additional information, refer to the *Natural Resources Technical Report* (VDOT, 2016f).

3.13 TERRESTRIAL WILDLIFE AND HABITAT

3.13.1 Existing Conditions

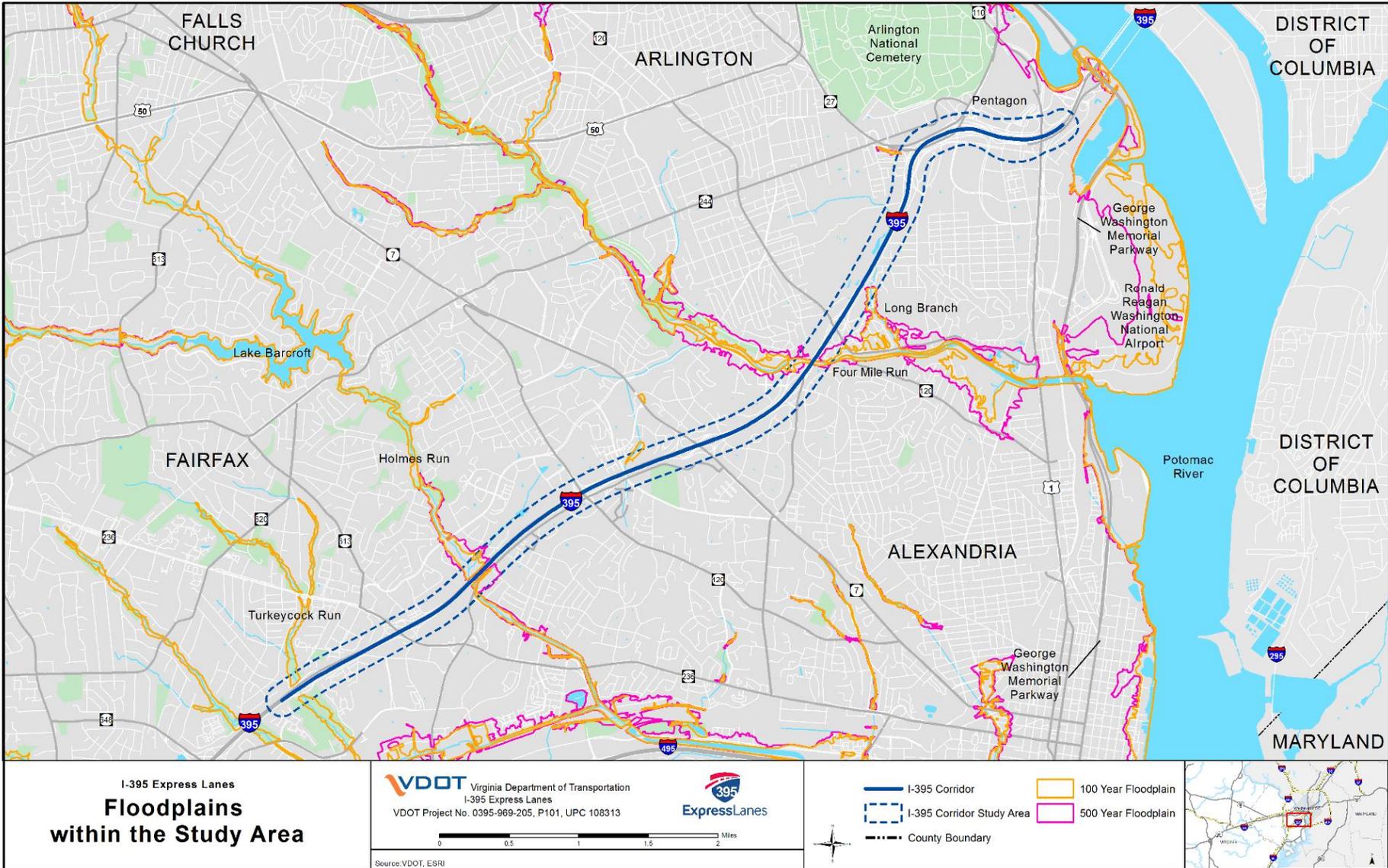
The wildlife in the study area consists of species adapted to urban environments and/or riparian corridors with forested habitat that support fauna usually found in less disturbed floodplain forests. Three urban wildlife corridors exist and are intersected by numerous roads, fragmenting the corridor. However, the corridors are still utilized; often urban-adjusted wildlife species use the corridors that follow the underpasses to pass beneath I-395.

3.13.2 Future Conditions

No Build Alternative

Under the No Build Alternative, no changes to terrestrial wildlife and habitat are anticipated as a result of Interstate improvements in the study area. An additional evaluation of the study area's terrestrial wildlife and habitat may be required if any programmed improvements under the No Build Alternative involve major new construction with federal funding. These effects would be addressed by the respective project sponsors.

Figure 3-9: Floodplains within the Study Area



Build Alternative

Although there are three wildlife corridors that travel through the study area, none of the wildlife corridors would be modified by the Build Alternative. In addition, the Build Alternative would not add impediments to their utilization by wildlife. Noise barriers may be placed adjacent to the road and wildlife corridors, but would not impede wildlife movement any more so than the existing highway and culverts. For additional information, refer to the *Natural Resources Technical Report* (VDOT, 2016f).

3.14 THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES**3.14.1 Existing Conditions**

Federally listed terrestrial species within the study area include the northern long-eared bat (*Myotis septentrionalis*) and the dwarf wedgemussel (*Alasmidonta heterodon*).

The northern long-eared bat is federally threatened and during fieldwork, VDOT observed trees within the study area that could serve as suitable summer maternity roost trees for northern long-eared bat.

The dwarf wedgemussel is federally endangered and found in freshwater streams along the Atlantic Coast. VDOT received a scoping response letter from VDCR, dated February 23, 2016, which noted the possible presence of the dwarf wedgemussel (*Alasmidonta heterodon*) in Holmes Run, a stream that runs under the existing I-395 corridor. Through site investigation, suitable habitat for the dwarf wedgemussel was confirmed in Holmes Run in the project area.

The Virginia Department of Game and Inland Fisheries (VDGIF) identified that Anadromous Fish Use areas are within two miles of the study area; however, no Anadromous Fish Use areas are currently mapped within the study area (refer to **Figure 3-10**).

The VDGIF Virginia Fish and Wildlife Information Service (VAFWIS) database indicated that no other potential or confirmed state-listed species are located within two miles of the study area.

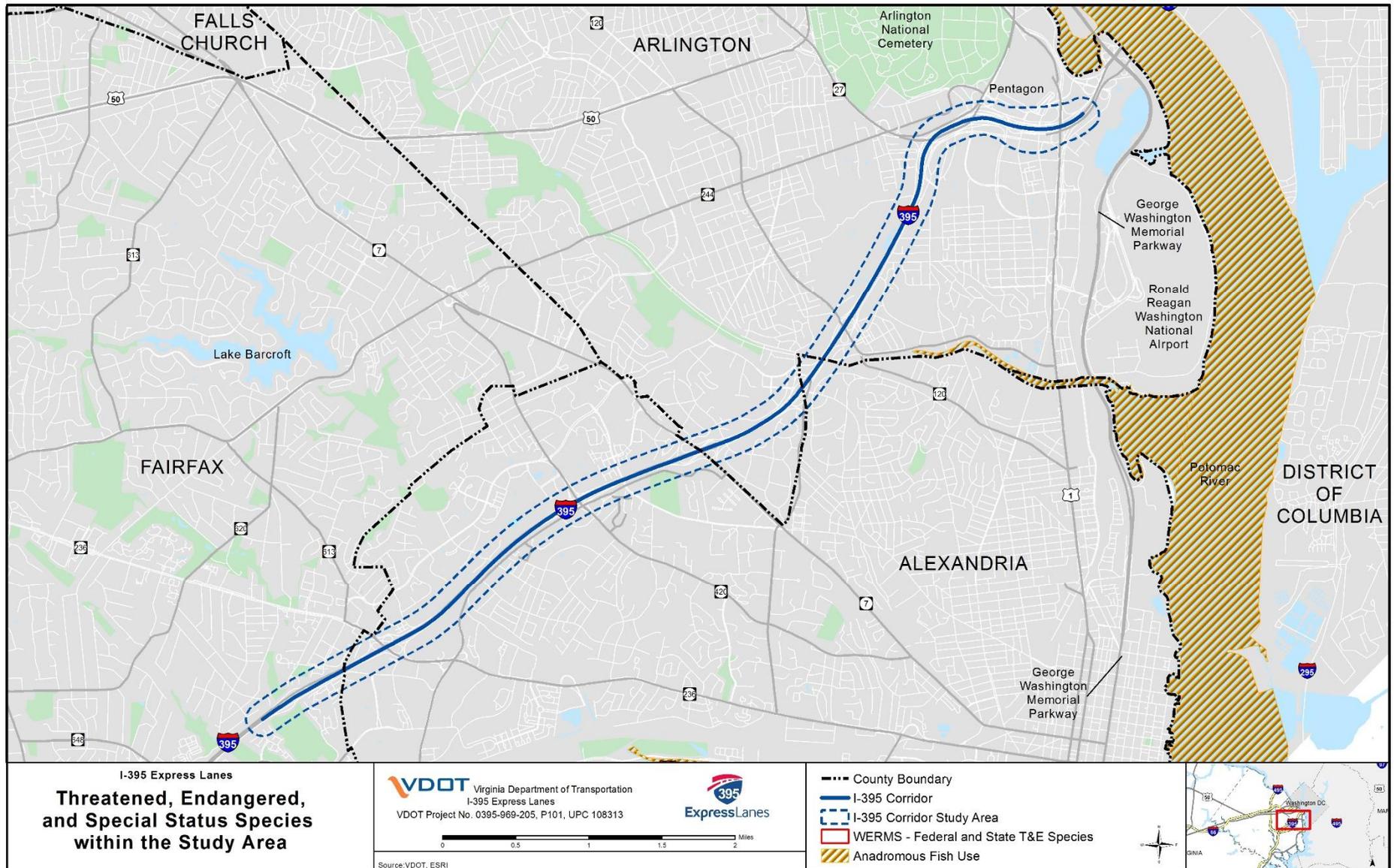
3.14.2 Future Conditions**No Build Alternative**

Under the No Build Alternative, no changes to threatened, endangered, or special status species habitat or populations are anticipated as a result of Interstate improvements in the study area. Additionally, since Anadromous Fish are not in the study area, no impacts are anticipated to Anadromous Fish Use. An additional evaluation of the study area's threatened, endangered, or special status species may be required if any programmed improvements under the No Build Alternative involve major new construction with federal funding. These effects would be addressed by the respective project sponsors.

Build Alternative

The Build Alternative would not impact any streams; therefore, no impact would occur to the dwarf wedgemussel. Additionally, no known or documented hibernacula or maternity roosts that the northern long-eared bat use occur in the study area; therefore, the northern long-eared bat would not likely be adversely affected.

Figure 3-10: Threatened, Endangered, and Special Status Species and Resources within the Vicinity of the Study Area



Although no impacts to Anadromous Fish use areas are currently proposed, because Anadromous Fish use areas are mapped downstream of the study area, any impacts to streams may be subject to time-of-year-restrictions, and, therefore, may require additional resource agency coordination. Further coordination with agencies and final effect determinations for listed species would be conducted as a part of the 401/404 permit process. For additional information, refer to the *Natural Resources Technical Report* (VDOT, 2016f).

3.15 HAZARDOUS MATERIALS

3.15.1 Existing Conditions

Environmental Data Resources, Inc. (EDR) was utilized to perform a search of Federal and State regulatory agency databases within a ½-mile radius from the study area corridor to identify potential recognized environmental concerns (RECs). Eight sites of elevated environmental concern were identified.

3.15.2 Future Conditions

No Build Alternative

The No Build Alternative would not disturb soil or groundwater that might have been impacted by any of the hazardous material sites. An additional evaluation of the study area's hazardous materials may be required if any programmed improvements under the No Build Alternative involve major new construction with federal funding. These effects would be addressed by the respective project sponsors.

Build Alternative

For most cases, it is difficult to determine from the EDR report and field verification how much of a substance was released, how much was removed, whether hazardous materials were cleaned up to the satisfaction of the jurisdictional agency, and whether hazardous substances remain. There is the potential that reported releases or spills associated with the sites may have impacted soil and groundwater within the study area corridor.

Prior to acquisition of right of way and construction, thorough site investigations would be conducted to determine whether any of the sites are actually contaminated, and, if so, the nature and extent of that contamination would be assessed. Sites that are identified to include potential contamination would be characterized by conducting thorough site investigations (i.e. Phase I Environmental Site Assessments (ESAs) and, if necessary, Phase II ESAs) to determine the presence of and/or the extent of contamination. Undocumented hazardous materials that are encountered during construction efforts shall be managed, handled and disposed of in accordance with federal, state and local regulations. For additional information, refer to the *Hazardous Material Technical Memorandum* (VDOT, 2016d).

3.16 INDIRECT AND CUMULATIVE EFFECTS

3.16.1 Indirect Effects

According to the Council on Environmental Quality (CEQ), indirect effects are "...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" (40 CFR § 1508(a)). The indirect effects analysis relies on the planning

judgment described in the National Cooperative Highway Research Program (NCHRP) 25-25 program, Task 22, *Forecasting Indirect Land Use Effects on Transportation Projects* (TRB, 2007). For additional information, refer to the *Indirect and Cumulative Effect Technical Report* (VDOT, 2016e).

No Build Alternative

Under the No Build Alternative, indirect effects related to increased traffic delays and lack of travel reliability would have a negative impact on businesses and residents. Proximity effects associated with the existing facility, including noise, air quality, and visual intrusions would continue to affect parks and historic resources. Potential indirect effects could be associated with petroleum from vehicles, and salt or chemicals due to road maintenance.

Build Alternative

Indirect effects from the Build Alternative are expected to be minimal since the proposed improvements are to an existing facility within existing right of way in an environment that is highly developed and influenced by highway-related pressures. The Build Alternative is expected to improve travel times, provide better access for public transit, and reduce congestion at Eads Street, encouraging businesses to remain in place. Additionally, as part of the Development Framework Agreement (see **Appendix C: Framework Agreement**), 95 Express would fund an annual transit payment. Funding from the annual transit payment would be applied to potential projects identified in the DRPT I-95/I-395 Transit/TDM study.

Potential indirect impacts to wetlands, streams, water quality, floodplains, wildlife habitat, and threatened, endangered, or special status species could result from increased stormwater runoff due to increases in impervious surfaces. However, indirect effects associated with sediment transport should be minor during construction through the proper use of stormwater control measures. During construction, VDOT would adhere to standard erosion and sediment control and stormwater measures and the associated required monitoring protocols.

Proximity effects associated with the existing facility, including noise, air quality, and visual intrusions, would continue to impact historic resources; however, based on VDHR and DC SHPO coordination, the Build Alternative would not adversely affect historic resources. Additional coordination with the DC SHPO and VDHR will be conducted during the final design noise analysis.

No induced growth is to be expected as a result of the Build Alternative. The study area and surrounding localities are already highly developed and any growth would continue regardless of the conditions of the surrounding roadway network.

3.16.2 Cumulative Effects

CEQ defines cumulative effects (or 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 agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR § 1508.7). The cumulative effects analysis is based on the process outlined in *Fritiofson v. Alexander*, 772 dF.2d 1225 (5th Cir. 1985), as described in FHWA’s *Guidance: Questions and Answers Regarding the Consideration of Indirect and Cumulative Impacts in the NEPA Process* (FHWA,

2014). Both the No Build Alternative and Build Alternative would contribute minimal incremental effects to socioeconomic, natural, and historic resources.

No Build Alternative

The Indirect and Cumulative Effects (ICE) study area has been in a progression of development since the early 1900s, being fully developed in the 1970s, in part due to the adjacency of the area to Washington, D.C. The potential for future development is largely limited to redevelopment due to lack of vacant land within the ICE study area. Potential redevelopment may increase congestion on the Interstate, causing drivers to divert onto local roadways.

Historically, conversion of natural areas to developed land has had the greatest impact on the area. This development has helped lead to the degradation and/or loss of natural resources over time. The degree of degradation was in part due to the lack of strong federal, state, and local protective regulations. Under the No Build Alternative there would be continued but reduced impact to terrestrial habitat from development due to the existing urbanized environment. Under the No Build Alternative, unconstrained runoff entering waters that are already impaired would continue to accelerate changes in the microbenthic structure and composition. These effects could result in changes in aquatic community structure at a local level, but may also extend further to include changes in ecosystem structure and function in the absence of proper mitigation.

Prior to the NHPA and local protective measures, the impact to historic resources through the development of the area was much higher than the potential for impacts today. Any projects that would occur under the No Build Alternative would have the potential to impact historic resources. The full extent of any architectural or archaeological resource impacts would be uncertain until the project specifics are known. However, for projects requiring a federal action, the NHPA of 1966 is in place to ensure these properties are considered during project planning. Additionally, local governments, VDHR, and the DC SHPO also aid in the protection of these properties whether they are private or public undertaking.

Build Alternative

The Build Alternative would alleviate congestion, thus contributing to minor beneficial cumulative effects to socioeconomics, land use, and community facilities. The short-term impact of more jobs and associated expenditures resulting from the Build Alternative is expected to benefit the local communities. Once complete, this project is not anticipated to create induced growth or infill development beyond what was anticipated without the project.

The Build Alternative's impacts to wetlands and water quality would contribute to the cumulative effects that have occurred in the past to natural resources within the study area. However, mitigation measures would compensate for impacts to wetlands and water quality. In addition, potential minimization strategies such as shifting potential noise barriers away from historic resources would be considered.

For additional information, refer to the *Indirect and Cumulative Effect Technical Report* (VDOT, 2016e).

3.17 SECTION 4(F)

Section 4(f) of the U.S. Department of Transportation Act of 1966 (49 U.S.C. § 303(c)) makes provisions for the preservation of public parks and recreational areas, wildlife and waterfowl refuges, and historic sites on or eligible for listing in the NRHP. The recreational and historic resources identified in **Sections 3.6**

and 3.7 were evaluated to determine if any of the impacts to the resources would be considered a “use.” The evaluation was guided by the definition of “use” in 23 CFR § 774.17. A determination of *de minimis* impact can be made only if the project would not adversely affect the features, attributes, or activities qualifying the property for protection under Section 4(f).

No Build Alternative

Under the No Build Alternative there would be no use of Section 4(f) resources. An additional evaluation of the Section 4(f) resources located in the study area may be required if any programmed improvements under the No Build Alternative involve major new construction with federal transportation funding. These effects would be addressed by the respective project sponsors.

Build Alternative

As discussed in **Section 3.6**, fifteen recreational resources are located within the study area. While none of these resources would be directly impacted by the Build Alternative, the resources could experience indirect effects, such as increased noise or traffic during construction and once the facility is operational. However, none of these impacts would constitute a use of Section 4(f) property.

As discussed in **Section 3.7**, five known historic resources are located within close proximity to the proposed improvements¹². Currently, 5.91 acres of potential impact are estimated for the construction of noise barriers, with 2.41 acres outside of the VDOT right of way and within historic districts (3.5 acres of potential impact are within VDOT right of way). The 2.41 acres of impact would be considered a Section 4(f) use. This value is based on a conservative estimate of the right of way width required to construct and maintain the barriers (approximately 30 feet). VDOT anticipates that during the final design noise analysis, barrier locations would be refined and may be shifted to be fully located within the VDOT right of way. Additional coordination with the VDHR and DC SHPO will be conducted based on further design details

¹² Additional resources were surveyed and identified by others after the cultural resources analysis for this EA was completed. To be conservative, the potential impacts associated with these potential historic properties have been included in this EA. Additional coordination with VDHR and DC SHPO will be conducted based on further design details in the vicinity of the historic resources.

CHAPTER 4.0 COORDINATION AND COMMENTS

Pursuant to 23 CFR § 771.111 and the Council on Environmental Quality (CEQ)'s *Memorandum for General Counsels, NEPA Liaisons, and Participants in Scoping*, the Virginia Department of Transportation (VDOT), in cooperation with Federal Highway Administration (FHWA), has coordinated extensively with local, state, and federal entities (stakeholders) as well as engaged in public involvement efforts throughout the development of the Interstate 395 (I-395) Express Lanes Project, in order to provide information and solicit feedback. Stakeholders were contacted early in the study and asked to assist in determining and clarifying benefits, interests, concerns, and issues relative to the study. The stakeholder feedback received in response to these coordination efforts was used to inform the study. Agency consultation and public participation for this study has been accomplished through formal and informal methods, which include project development team meetings, interagency correspondence, Public Information Meetings (PIM), Public Hearings, Civic Association meetings, and Stakeholder Technical Advisory Group (STAG) meetings. This coordination is discussed in greater detail in the sections below. Additionally, as guided by FHWA Order 6640.23A and FHWA Memorandum Guidance on Environmental Justice (EJ) and National Environmental Policy Act (NEPA), proactive efforts were taken to ensure meaningful opportunities for public participation by all interested parties, including low-income and minority populations.

4.1 AGENCY COORDINATION

VDOT mailed scoping letters to the following federal, state, and local agencies and organizations to obtain pertinent information and to identify key issues regarding the potential environmental impacts for this study.

- City of Alexandria
- County of Arlington
- City of Fairfax
- District of Columbia
- District of Columbia Department of Transportation
- County of Fairfax
- Metropolitan Washington Council of Governments
- George Washington Memorial Parkway, National Park Service
- National Capital Planning Commission
- National Oceanic and Atmospheric Administration, Habitat Conservation Division
- United States Air Force, Air Force Memorial Foundation
- United States Army Corps of Engineers
- United States Department of Agriculture, Natural Resources Conservation Service
- United States Department of Defense, Integrated Services Division (Pentagon)
- United States Department of Homeland Security, Federal Emergency Management Agency
- United States Department of Homeland Security, United States Coast Guard
- United States Department of Housing and Urban Development
- United States Department of the Interior, Office of Environmental Policy and Compliance
- United States Department of the Interior National Park Service, Northeast Region
- United States Department of the Interior Fish and Wildlife Service
- United States Environmental Protection Agency
- United States Department of Agriculture, Forest Service
- Virginia Department of Health

- United States Department of Defense, Office of Economic Adjustment
- United States Department of Transportation, Federal Railroad Administration
- United States Department of Transportation, Federal Transit Administration
- Virginia Department of Agricultural and Consumer Services
- Virginia Department of Aviation
- Virginia Department of Conservation and Recreation
- Virginia Department of Emergency Management
- Virginia Department of Environmental Quality
- Virginia Department of Forestry
- Virginia Department of Game and Inland Fisheries
- Virginia Department of Historic Resources
- Virginia Department of Housing and Community Development
- Virginia Department of Mines, Minerals and Energy
- Virginia Department of Rail and Public Transportation
- Virginia Economic Development Partnership
- Virginia Marine Resources Commission
- Virginia Outdoors Foundation
- Virginia State Police Department
- Washington Metropolitan Area Transit Authority

4.1.1 Agency Scoping Responses

In response to the scoping letters, VDOT received responses from a number of agencies identifying transportation needs, environmental resources, and other relevant factors to be analyzed in this Environmental Assessment (EA). Responses were received on behalf of the following agencies (see **Appendix B: Correspondence** for full responses):

- **Air Force Association** – Requested free access points for patrons who wish to visit the Memorial.
- **City of Alexandria** – Response stated concerns about impacts the project may have on cut through traffic between I-395 and I-495 along the Quaker Lane and Seminary Road corridors. Recommended examining improvement options to the Northbound Quaker Lane merge onto Shirlington Circle to eliminate the confusion with the current yield sign. Indicated concern for impacts to local traffic created by local residents who would no longer be able to use the High Occupancy Vehicle (HOV) lanes during non-HOV hours and must use other routes. Response sought additional information on potential impacts to local priority projects, congestion, and access management.
- **County of Arlington** – Response stated that the County supports the level of analysis conducted and wants to participate in development of the EA and community outreach. Noted primary concerns relate to the spillover impact of any additional traffic on arterials in the already congested Pentagon City neighborhood. Noted that the project should not undermine regional investments in transit and local investments in transit oriented development. Response sought additional information on potential gantry locations in the vicinity of the Pentagon to facilitate operations.
- **County of Fairfax** – Recommended that provisions be made for integration of bicycle lanes into ramps and crossing for the I-395 project. Noted that Route 236 is planned to be widened to six lanes in the vicinity of I-395. Indicated that buses currently leaving the Pentagon Transfer Center

at the Pentagon use the Connector Road and Boundary Channel Drive to access I-395 general purpose (GP) lanes and recommended that the Pentagon maintain this movement and that the project not impact the ability of buses entering and leaving the Pentagon Transfer Center to access the GP lanes at the Boundary Channel Drive Interchange. Noted that the EA should address impacts to wetlands, streams, floodplains, consider stormwater management, etc. Identified several parks within the vicinity of the project that serve the community and provide ecosystem services and water quality benefits to the Cameron Run watershed. Noted that unavoidable impacts to Park resources should be mitigated in consultation with Park Authority staff and recommended consultation with Virginia Department of Historic Resources (VDHR) in accordance with Section 106 of the National Historic Preservation Act (NHPA).

- **Virginia Department of Conservation and Recreation (VDCR)** – Response noted the potential for the dwarf wedgemussel (*Alasmidonta heterodon*) to occur in the Holmes Run stream. The species is currently classified as endangered by the United States Fish and Wildlife Service (USFWS) and Virginia Department of Game and Inland Fisheries (VDGIF). VDCR recommends implementation of, and strict adherence to, applicable state and local erosion and sediment control/storm water management laws and regulations. Recommended coordination with USFWS and VDGIF, to ensure compliance with protected species legislation. To minimize the potential for invasive species infestation, recommended that the project be conducted to minimize the area of disturbance, and disturbed sites should be revegetated with desirable species. Noted that the proposed project would not affect any documented state-listed plants or insects.
- **Virginia Department of Environmental Quality (VDEQ) Air Division** – Response noted that during the execution of the project, the following Virginia Air regulations should be considered: 9 VAC 5-40-5600 et. seq. – open burning and 9 VAC 5-50-60 et seq. – fugitive dust emissions. Additionally, during construction, all precautions are to be taken to restrict emissions of volatile organic compounds (VOC) and oxides of nitrogen (NO_x).
- **VDEQ Office of Environmental Impact Review** – Response noted that VDOT would need to file a Federal consistency document to the Office of Federal Consistency Review.
- **VDEQ Office of Wetlands and Stream Protection** – Response noted that based on the information provided, VDEQ is unable to determine impacts to surface waters. Recommended an onsite delineation to determine location, extent, and type of wetland or other surface waters present. Noted that the applicant should minimize impacts to surface waters to the greatest extent practicable. Indicated that the Office of Water Protection Division was unaware of any current or proposed projects that would have specific identifiable impacts to the area under VDOT’s study area. VDEQ recognized that the project would have positive indirect effects, e.g. improved safety and traffic flow, but noted that VDEQ is not qualified to identify road project benefits. VDEQ recommends adherence to all appropriate environmental permits. VDEQ recommended the use of the Coastal Geospatial and Educational Mapping System (GEMS) database and the Virginia Environmental Geographic Information System (VEGIS) viewer to help inform the planning process.
- **Virginia Department of Mines, Minerals and Energy (VDMME)** – Response indicated that VDMME did not see conditions that would require further review.
- **Department of Rail and Public Transportation (DRPT)** – Response noted that DRPT had just initiated a parallel transit and Transportation Demand Management study.
- **Federal Railroad Administration (FRA)** – Response indicated that there is no connection for this proposal to any existing or proposed railroad.

- **Housing and Urban Development (HUD)** – Response indicated that the Richmond field office can find no impact as a result of VDOT’s project plans.
- **Natural Resources Conservation Service (NRCS)** – Response indicated that the corridor does not contain prime, unique statewide or locally important farmland.
- **United States Army Corps of Engineers (USACE)** – Response indicated that the USACE considers a full range of public interest factors, and conducts a public interest analysis in order to identify the least environmentally damaging practicable alternative, which is the only alternative the USACE can authorize. Factors to be considered include land use, floodplain hazards and values, water supply and conservation, water quality, safety, cost, economics, threatened and endangered species, historic and cultural resources, navigation, and environmental justice. Additionally, the USACE authorized FHWA to conduct coordination on behalf of USACE for the I-395 Express Lanes project in accordance with Section 7 of the Endangered Species Act.
- **United States Forest Service (USFS)** – Response indicated that unless National Forest System lands are impacted or VDOT is seeking a specific area of expertise the USFS can provide, the Service has no comment.
- **USFWS** – Response noted that USFWS does not provide individual responses to requests for environmental reviews and directed VDOT to utilize their project review website to ensure that potential impacts to important natural resources are minimized and appropriate permits are applied.
- **Virginia Department of Agriculture and Consumer Services (VDACS)** – Recommended VDOT consider impacts of farmland and forest lands, and that VDOT adequately consider alternatives and mitigating measures. Recommended contacting VDCR for any inquiries related to state protected plant and insect species.
- **VDGIF** – Response recommended accessing the Virginia Fish and Wildlife Information Service (VAFWIS) website for information on wildlife resources under their jurisdiction that may be present in or near the project site.
- **Virginia Department of Health (VDH)** – Response noted that there are no apparent impacts to public drinking water sources due to the project.
- **VDHR** – Response noted that the undertaking has the potential to affect properties that are listed or eligible for protection under the National Register and requested VDOT to continue consulting with them pursuant to Section 106 of the NHPA.
- **Virginia Marine Resources Commission (VMRC)** – Advised that if any portion of the project involves any encroachments channelward of ordinary high water along natural rivers and streams above the fall line or mean low water below the fall line, a permit may be required.
- **Virginia Outdoors Foundation (VOF)** – Response noted that there are no existing or proposed VOF open space easements within or in the vicinity of the project.

4.2 PUBLIC INVOLVEMENT

Public involvement is a critical element in the development and delivery of transportation projects. VDOT strives to provide opportunities to the public to participate in public decisions on transportation projects and programs.

4.2.1 Public Information Meetings

VDOT held two Formal PIMs to provide an opportunity for any person, organization, or agency to express their concerns related to the proposed project and provide comments. The first meeting was held on April 11, 2016 from 6:30 p.m. to 8:30 p.m. at Wakefield High School, 1325 South Dinwiddie Avenue, Arlington, Virginia. The second meeting was held on April 13, 2016 from 6:30 p.m. to 8:30 p.m. (meeting concluded at 8:50 due to volume of commenters) at Francis C. Hammond Middle School, 4646 Seminary Road, Alexandria, Virginia.

The purpose of the meetings was to provide the public an opportunity to informally review the proposed improvements and discuss them with VDOT, representatives of 95 Express Lanes, LLC (95 Express), and the DRPT. Pursuant to federal and state regulatory requirements and in accordance with VDOT's Policy Manual for Public Participation in Transportation Projects (VDOT 2015a), the meeting was advertised in local newspapers, on the study website, and via a press release. Additionally, a total of 108,656 postcards were mailed on March 24, 2016 to residents of the Counties of Arlington and Fairfax, and the City of Alexandria for both PIMs. Comment sheets and informational handouts were provided at the meeting and were also made available on the study website. Project display boards were available for review at the meeting and were also made available on the study website. During each meeting the VDOT representatives formally presented the project. Following the formal presentation representatives from VDOT, 95 Express, and the DRPT responded to public comments. VDOT representatives were available to discuss the study and explain project display boards. Questions were answered during the public forum as well as during one on one discussions. In total, 26 comment forms and 36 emailed or mailed comments were received during the PIM's or during the 10-day comment period following the Meetings. Thirty-three oral statements were recorded at the meetings.

4.2.2 Public Hearing

Following circulation of the EA, VDOT held Combined Location and Design Public Hearings for this project. Combined Location and Design Public Hearings were held on the following dates: October 24, 2016 at Wakefield High School, 1325 South Dinwiddie Avenue, Arlington; October 26, 2016 at Francis C. Hammond Middle School, 4646 Seminary Road, Alexandria; November 30, 2016 at Bren Mar Park Elementary School, 6344 Beryl Road, Alexandria; and December 01, 2016 at 6540 Franconia Rd, Springfield, Virginia. Pursuant to federal and state regulatory requirements and in accordance with VDOT's Policy Manual for Public Participation in Transportation Projects (VDOT, 2015a), the meetings were advertised in local newspapers, on the study website, and via press releases. Additionally, notification letters were sent out to all property owners within or adjacent to the study area 30 days prior to the November 30th Public Hearing per the Code of Virginia §33.2-257.1.

The purpose of the public hearings was to present the findings of the EA and associated technical documents, provide a discussion forum between the public and study team, and solicit input and comments from the community. In addition, all public and agency comments received during the comment period (September 09 thru December 16, 2016) that followed the release of the EA were taken into consideration and incorporated, as appropriate, in the revisions for this Revised EA. All comments received during the public hearings and comment period have become part of the public hearing record and all substantive comments have been addressed. For responses to substantive comments received during the comment period, see **Appendix D: Comments and Responses**.

4.2.3 Additional Coordination Efforts

In addition to the coordination previously discussed, numerous other meetings and coordination efforts were conducted with federal, state, and local agencies throughout the study process including:

- Three STAG meetings;
- 15 Civic Association meetings;
- Coordination with District of Columbia State Historic Preservation Office;
- Coordination with District of Columbia Department of Transportation;
- Technical working group meetings (traffic, engineering, etc.); and
- Department of Defense (Pentagon) meetings.

Mailing List

A study mailing list was developed, and 1,073 property access letters were mailed pursuant to §33.1-94 of the Code of Virginia. Four hundred and forty seven were mailed to the residents of the Alexandria area, 311 were mailed to residents of Arlington County and 315 were mailed to Fairfax residents. VDOT mailed property owners within the study area that an agent of VDOT may need to access their property to locate property lines and utilities; locate and review physical features and existing conditions; take photographs; talk to property owners; verify property tax information; perform environmental resource surveys; investigate potential environmental impacts; and conduct all testing and sampling, including, but not limited to shovel tests, soil samples, and borings. The letter included contact information for the VDOT Project Manager, should letter recipients have questions or concerns.

Website

Information for the study, including the EA and all technical documentation, is available to the public through the following VDOT website:

http://www.virginiadot.org/projects/northernvirginia/395_express.asp.

The website has been updated as new information has become available. For example, upon initiation of the study a notice was posted to provide preliminary study information. As the study progressed and PIM dates were set, the dates along with meeting materials were posted and included comment forms for the public to provide feedback on the study.

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