



ENVIRONMENTAL ASSESSMENT

# Socioeconomic and Land Use Technical Report

February 2020



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## 1.0 INTRODUCTION

The Virginia Department of Transportation (VDOT), in coordination with the Federal Highway Administration (FHWA) as the lead federal agency, is evaluating an extension of the Interstate 495 (I-495) Express Lanes along approximately three miles of I-495, also referred to as the Capital Beltway, from their current northern terminus in the vicinity of the Old Dominion Drive overpass to the George Washington Memorial Parkway (GWMP) in the McLean area of Fairfax County, Virginia. Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended, and in accordance with FHWA regulations<sup>1</sup>, an Environmental Assessment (EA) is being prepared to analyze the potential social, economic, and environmental effects associated with the improvements being evaluated.

The purpose of this technical report is to identify existing socioeconomic resources and land uses within the study area and to evaluate potential impacts that could result from implementation of the Build Alternative. Information in this report provides an overview of the regulatory context, methods used to identify existing resources, potentially affected resources identified within the study area, and potential impacts to socioeconomic resources and land uses associated with the implementation of the Build Alternative. The findings of this technical report support discussions presented in the EA.

### 1.1 PROJECT TERMINI

The project includes an extension of the existing Express Lanes from their current northern terminus south of the Old Dominion Drive Overpass to the GWMP. Although the GWMP provides a logical northern terminus for this study, additional improvements are anticipated to extend approximately 0.3 miles north of the GWMP to provide a tie-in to the existing road network in the vicinity of the American Legion Memorial Bridge (ALMB). The project also includes access ramp improvements and lane reconfigurations along portions of the Dulles Toll Road and the Dulles International Airport Access Highway, on either side of the Capital Beltway, from the Spring Hill Road Interchange to the Route 123 interchange. The proposed improvements entail new and reconfigured express lane ramps and general purpose lane ramps at the Dulles Interchange and Route 123/I-495 interchange ramp connections.

### 1.2 STUDY AREA

In order to assess and document relevant resources that may be affected by the proposed project, the study area for this EA extends beyond the immediate area of the proposed improvements described above. The study area for the EA includes approximately four miles along I-495 between the Route 123 interchange and the ALMB up to the Maryland state line. The study area also extends approximately 2,500 feet east along the GWMP. Intersecting roadways and interchanges are also included in the study area, as well as adjacent areas within 600 feet of the existing edge of pavement.

The study area boundary is a buffer around the road corridor that includes all natural, cultural, and physical resources that must be analyzed in the EA. It does not represent the limits of disturbance (LOD) of the project nor imply right-of-way take or construction impact, but rather extends beyond the project footprint

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<sup>1</sup> 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.

to tie into the surrounding network, including tying into future network improvements. **Figure 1-1** depicts the project termini, study area, and LOD.

### **1.3 LIMIT OF DISTURBANCE**

Potential impacts to socioeconomic resources and land uses described in the following sections of this technical report have been calculated using a conceptual level design of the Build Alternative. The footprint for this conceptual level of design is referred to as the LOD. The LOD accommodates roadway improvements, drainage, stormwater management facilities, utilities, erosion and sediment control, noise control measures, construction methods, and temporary construction easements.

Impact values presented for the evaluated resources represent the worst-case scenarios and assume complete direct impact to the resource occurring in the LOD. As design progresses, measures may be taken to avoid and minimize impacts to the resources to the maximum extent practicable. Recommendations for potential minimization and mitigation measures for unavoidable adverse impacts are provided under the Build Alternative sections of each resource that is discussed in this report. At this time, it is not possible to anticipate the exact locations of each proposed activity; impacts outside of the existing study area will be reviewed and documented through future NEPA re-evaluations.

### **1.4 PURPOSE AND NEED**

The purpose and need for the extension of Express Lanes on I-495 between Route 267 and the GWMP is to:

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

A detailed description of the purpose and need for the proposed project can be found in Chapter 1 of the EA.

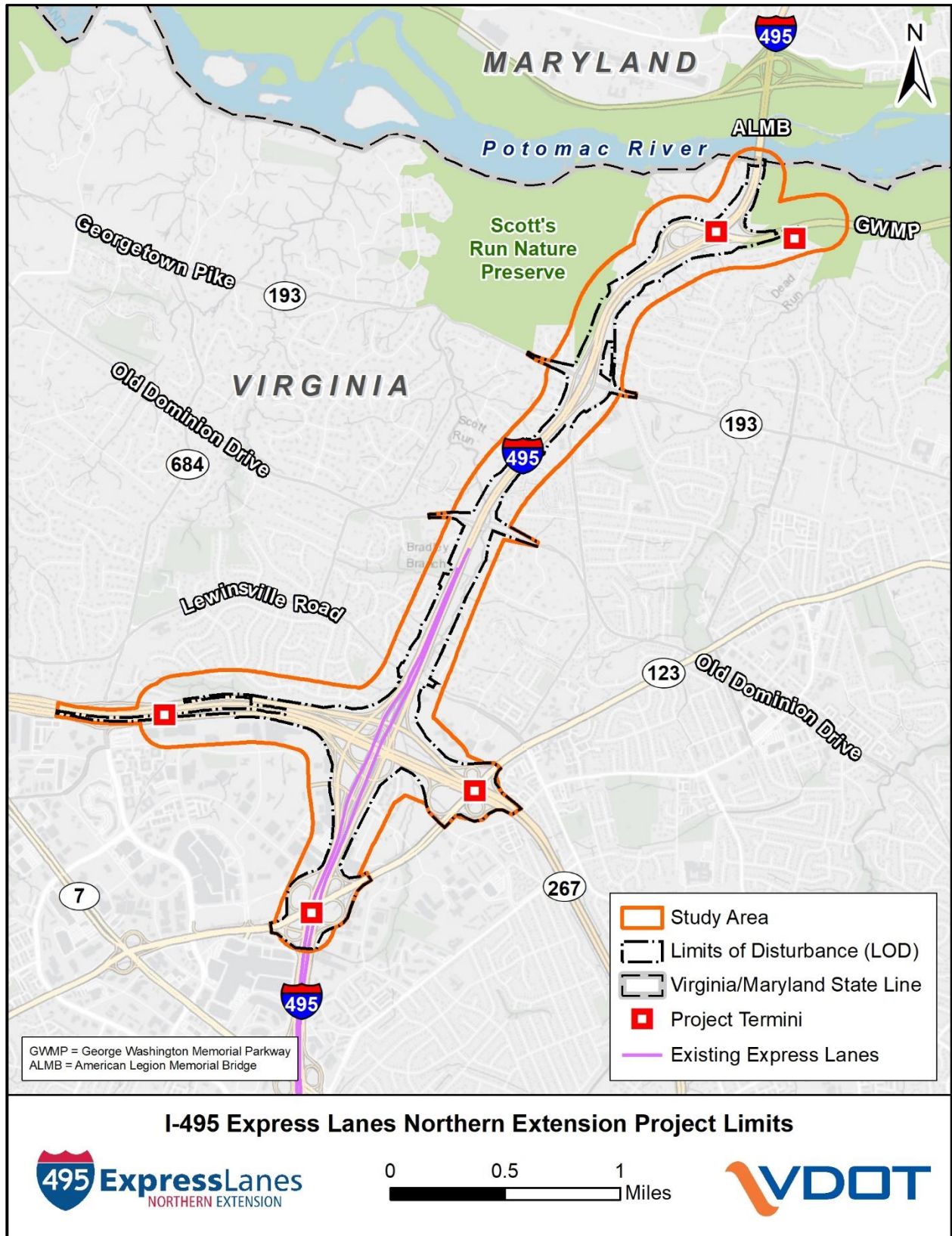


Figure 1-1. I-495 Express Lanes Northern Extension Project Limits

## 2.0 ALTERNATIVES

Two alternatives are being considered in the EA: the No Build Alternative<sup>2</sup> and the Build Alternative, described below. Additional information on the Build Alternative is included in the *I-495 Alternatives Development Technical Memorandum* (VDOT, 2020a).

### 2.1 NO BUILD ALTERNATIVE

Under the No Build Alternative, the Express Lanes would not be extended beyond the existing northern terminus at Old Dominion Drive. There would be no change to existing access points, and I-495 would remain in its present configuration. VDOT would continue maintenance and repairs of the existing roadway, as needed, with no substantial changes to current capacity or management activities.

### 2.2 BUILD ALTERNATIVE

The Build Alternative would extend the existing four I-495 Express Lanes from their current terminus between the I-495/Route 267 interchange and the Old Dominion Drive Overpass north approximately 2.3 miles to the GWMP. Additional improvements are anticipated to extend approximately 0.3 miles north of the GWMP to tie into the existing road network in the vicinity of the ALMB. The Build Alternative would retain the existing number of general purpose (GP) lanes within the study area.

Direct access ramps would be provided from the I-495 Express Lanes to the Dulles Toll Road and the GWMP. Access would also be provided between the I-495 GP and Express Lanes at the Route 267 interchange: from northbound GP lanes to northbound Express Lanes, and from southbound Express Lanes to southbound GP lanes, located within the current interchange footprint. These connections have been accounted for in the LOD and are described in more detail in the *I-495 Alternatives Development Technical Memorandum* (VDOT, 2020a) and the *I-495 Traffic and Transportation Technical Report* (VDOT, 2020b).

The Build Alternative includes an approximately 3.1-mile 10-foot-wide shared-use path, consistent with the Fairfax County Countywide Trails Plan Map (FCDPZ, 2018) that is not provided under the existing condition.

## 3.0 LAND USE, PROPERTY, AND RIGHT-OF-WAY

### 3.1 METHODOLOGY

Land use within the study area was identified using Geographic Information Systems (GIS) data from Fairfax County (Fairfax County, 2018a), planning documents from local jurisdictions, and aerial imagery. The following land use classifications are used in this analysis:

- Commercial
- High-density residential
- Medium-density residential
- Low-density residential
- Institutional
- Open land, not forested or developed
- Recreational
- Utilities
- Right-of-way

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<sup>2</sup> According to FHWA guidelines, the consideration of a No Build Alternative is a requirement under NEPA. The Build Alternative must be reasonable and practicable enough to dismiss the No Build Alternative (FHWA, 1990).

Anticipated impacts to properties were identified by overlaying the conceptual LOD on Fairfax County parcel data in GIS. The LOD includes both the area where improvements are anticipated and the area necessary for construction access to implement the improvements. Temporary right-of-way use is short-term and upon construction would be returned to property owners in condition similar to its prior state. Temporary land use is therefore not considered land use conversion.

## 3.2 EXISTING CONDITIONS

### 3.2.1 Existing Land Use

Land uses in the study area (see **Table 3-1** and **Figure 3-1**) other than public right-of-way are primarily low-density residential (22%), commercial (10%), and recreational (12%). There are three major government facilities located in the study area on Tysons McLean Drive: National Counterterrorism Center, Liberty Crossing Intelligence Campus, and National Counterproliferation Center.

There are many parks and recreational uses in the vicinity, including several within the study area. These are particularly concentrated in the northern part of the study area. The largest sites are the GWMP and adjacent parkland, and Scott's Run Nature Preserve. Fairfax County land use data designated these two sites as institutional use because of the agency ownership; however, these sites have been documented as recreational use for the purposes of this report. VDOT has coordinated with both Fairfax County and the National Park Service throughout development of this project and has incorporated several minimization and mitigation measures into the project's design. These minimization and mitigation measures are anticipated to reduce impacts to recreational properties within the study area. More regarding these recreational resources is in **Section 4.2**.

**Table 3-1. Study Area Land Use**

County Land Use Class	Acres within Study Area	Percent within Study Area
Commercial	105	10%
High-Density Residential	17	2%
Medium-Density Residential	<1	<1%
Low-Density Residential	239	22%
Institutional	19	2%
Open Land, not forested or developed	63	6%
Recreational*	126	12%
Utilities	4	<1%
Right-of-Way	516	47%
<b>TOTAL</b>	<b>1,089</b>	<b>100%</b>

Source: 2018 Fairfax County Existing Land Use Generalized GIS Open Data

\*Includes public, private, and federally owned properties.



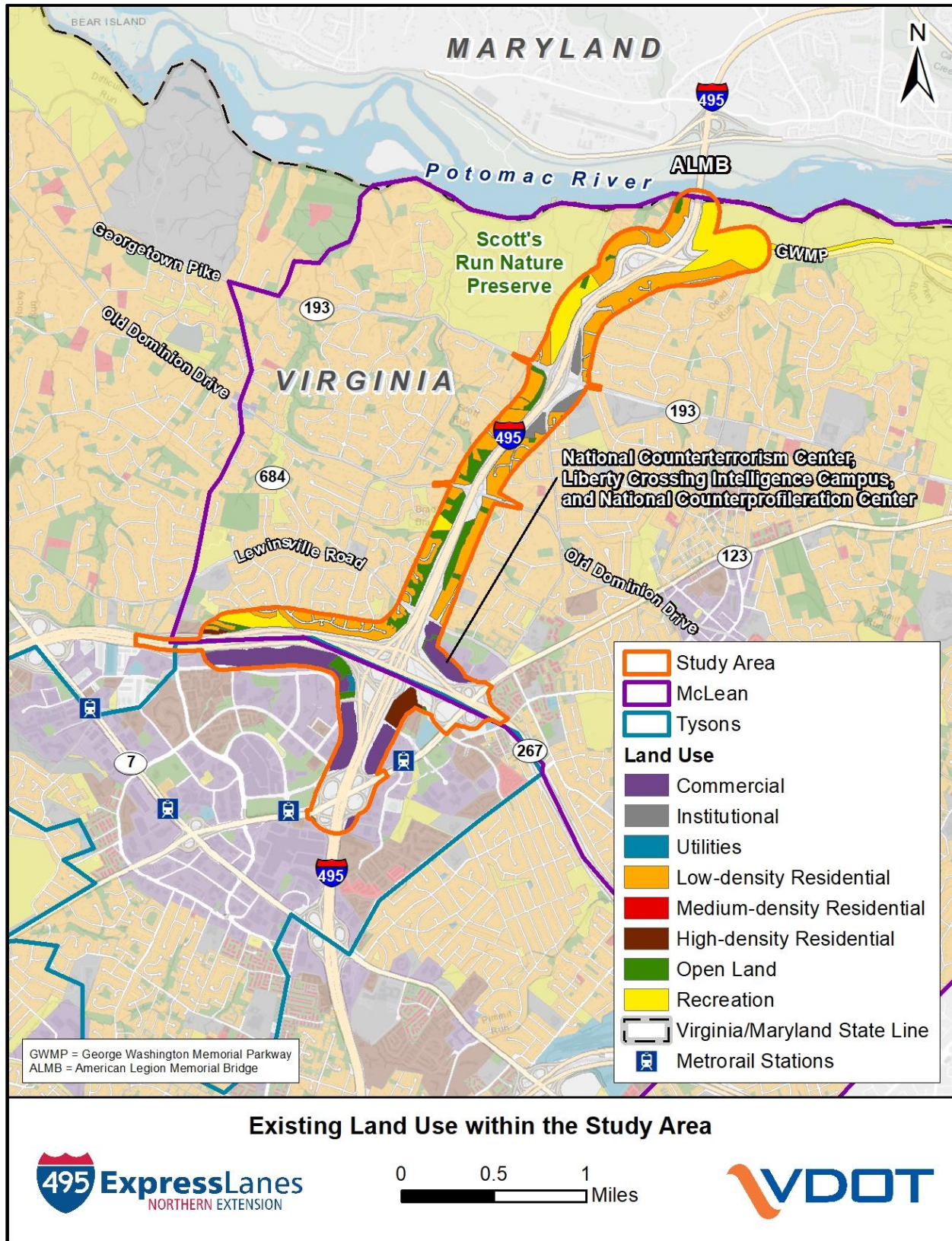


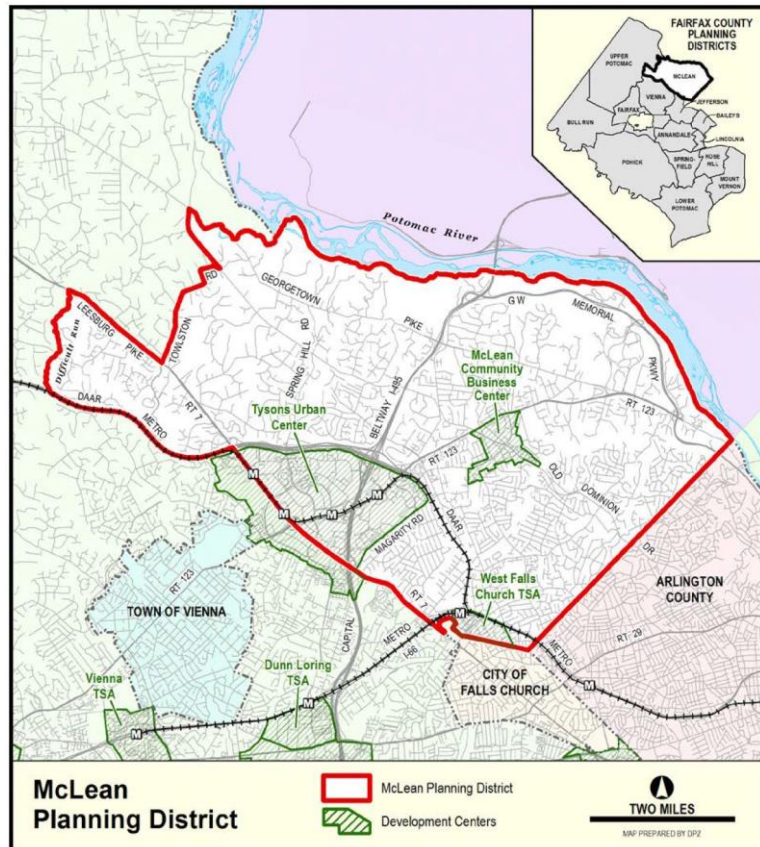
Figure 3-1. Existing Land Use Within the Study Area

### 3.2.2 Land Use and Transportation Plans

Land use and development within Fairfax County and the study area is guided by the *Fairfax County Comprehensive Plan* (Fairfax County, 2017). I-495 is a major transportation corridor that surrounds Washington, D.C. and connects the adjacent communities within Maryland and Virginia. The Comprehensive Plan includes two unique districts that are within the study area: the proposed project lies mostly within the McLean Planning District, and a portion of the southern terminus of the study area lies within Tysons Urban Center (**Figure 3-2**).

#### *McLean Planning District*

The McLean Planning District is in the northeast portion of Fairfax County and is bounded on the north by the Potomac River, on the southeast by Arlington County and the City of Falls Church, and on the southwest by Leesburg Pike and Route 7. According to the *Fairfax County Comprehensive Plan*, the McLean Planning District is predominantly composed of stable, low-density residential neighborhoods and the McLean Community Business Center (Fairfax County, 2017). Commercial uses are limited, with only a few neighborhood-oriented commercial areas throughout the planning district. The Comprehensive Plan recommends maintaining most of the McLean Planning District as Suburban Neighborhoods and Low-Density Residential Areas for future land use. A Comprehensive Plan amendment is underway for the 230-acre McLean Community Business Center.



Source: 2017 Fairfax County Comprehensive Plan

**Figure 3-2. 2017 McLean Planning District Map**

#### *Tysons Urban Center*

The Tysons Urban Center is the largest concentration of transit-oriented development and retail in the Washington, D.C. region. Tysons is located at the confluence of I-495, Route 267, Leesburg Pike, and Chain Bridge Road/Dolley Madison Boulevard and is also accessible via four Silver Line Metrorail stations: McLean, Tysons Corner, Greensboro, and Spring Hill. According to the *Fairfax County Comprehensive Plan*, Tysons is comprised of a large concentration of office and retail development that is supported by the adjacent high-density residential communities (Fairfax County, 2017).

### 3.2.3 Future Land Use and Transportation Plans

Due to the high level of development throughout the study area, options for future development are limited. This area is anticipated to continue to have mostly suburban neighborhood development (Fairfax County,

2018c). Suburban neighborhood land use includes a range of housing types as well as supplemental neighborhood-serving commercial uses, public facilities, and institutional uses. The portion of the study area northeast of Route 193 that borders the Potomac River is proposed to continue as low-density residential.

The *Fairfax County Transportation Plan* (Fairfax County, 2015) and *Fairfax County Comprehensive Plan* (Fairfax County, 2017) depict I-495 within the Build Alternative's study area as having Express Lanes and improvements at the GWMP, Route 193, and Route 267 interchanges, including a new highway overpass over I-495.

### 3.3 ENVIRONMENTAL CONSEQUENCES

#### *No Build Alternative*

The No Build Alternative would involve no construction and would not require right-of-way acquisition; therefore, it would have no direct impact on land use, property, or right-of-way. It is assumed that any locally approved infrastructure and development projects would continue as planned since the proposed I-495 improvements would not create or change access to any properties or other roadways.

The No Build Alternative is not consistent with the *Fairfax County Transportation Plan* or the *Fairfax County Comprehensive Plan* because it would not provide Express Lanes or interchange improvements as identified in those plans.

#### *Build Alternative*

**Table 3-2** lists the proportion of land uses within the study area that would be permanently converted to public roadway right-of-way or permanent maintenance easement under the Build Alternative (shown on **Figure 3-3**). The majority of construction would be limited to the existing right-of-way; however, locations in the vicinity of the Route 267 and GWMP interchanges and overpasses would require permanent right-of-way acquisitions and maintenance easements on 44 properties. No full property acquisitions or relocations of residential, commercial, recreational, or institutional properties are proposed. Partial property acquisitions are not anticipated to jeopardize the primary use of or access to any property. Temporary access easements required for the construction of the Build Alternative would be short-term and returned to the existing land use once construction is completed.

In accordance with the *Uniform Relocation Assistance and Real Property Policies Act of 1970*, as amended, affected property owners would be fairly compensated for property acquisition. These calculations are preliminary estimates based on the current design and surveyed property boundaries. The full right-of-way impacts will be determined during final design. As discussed in **Section 3.1, Methodology**, property impacts may be minimized or converted to temporary use as design progresses.

The Build Alternative would provide Express Lanes along I-495 and improvements at the GWMP, Georgetown Pike, and Route 267 interchanges, and would not change the overall land use within the study area. Therefore, the Build Alternative would be consistent with the *Fairfax County Transportation Plan* and the *Fairfax County Comprehensive Plan*.

**Table 3-2. Land Use Conversion Under the Build Alternative**

Land Use	Acres within Study Area	Acres Converted to Public Roadway Right-of-Way	Acres Converted to Permanent Maintenance Easement	Number of Parcels Partially Converted to Transportation Use**
Commercial	105	-	<0.1	1
High-Density Residential	17	-	-	-
Medium-Density Residential	<1	-	-	-
Low-Density Residential	239	0.8	2.5	28
Institutional	19	0.4	0.7	2
Open Land, not forested or developed	63	1.6	4.4	11
Recreational*	126	0.5	-	1
Utilities	4	0.2	-	1
<b>Total</b>	<b>573</b>	<b>3.6</b>	<b>7.6</b>	<b>44</b>

Source: 2018 Fairfax County Existing Land Use Generalized GIS Open Data

\* Includes public, private, and federally owned properties.

\*\*Does not include all properties affected by project. Conversions due to impacts such as permanent utility easements, drainage easements, and temporary construction easements will be identified as designs progress.

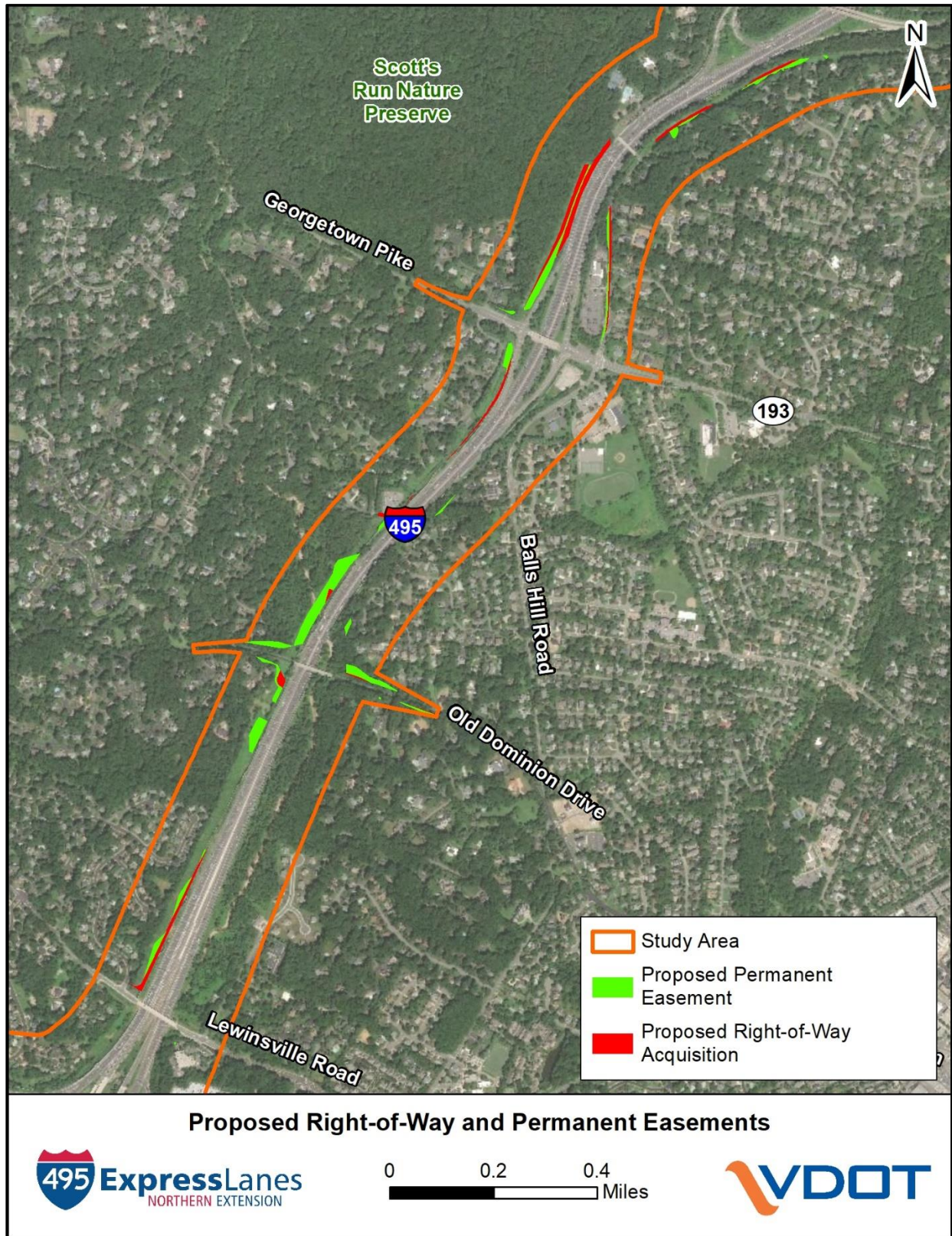


Figure 3-3. Proposed Right-of-Way and Permanent Easements

## 4.0 COMMUNITIES AND COMMUNITY FACILITIES

### 4.1 COMMUNITIES

#### 4.1.1 Methodology

Transportation corridors have the potential to directly impact communities and community cohesion in several ways. Community cohesion, as used in this analysis, is a loosely defined concept of community identity potentially based on community character and spatial cohesion gained by accessibility to neighbors, community facilities, goods, and services. The level of cohesion in communities may vary depending on these characteristics or how long residents have stayed or plan to stay in the area. Transportation impacts to community cohesion “may be beneficial or adverse, and may include splitting neighborhoods, isolating a portion of a neighborhood or an ethnic group...or separating residents from community facilities” (FHWA, 1987). Construction and expansion of existing transportation corridors can disrupt community cohesion by changing connectivity between residential neighborhoods (i.e., physically dividing communities); displacing residents; disrupting access to community facilities, either on a temporary or permanent basis; and introducing noise and visual elements incompatible with existing surrounding conditions (FHWA, 1996; FHWA, 1998).

Another way that transportation projects may affect a community is by changing access. This may be through an improvement in connectivity, by reducing congestion or cut-through traffic within a community, or by changing mobility options such as by converting roads to cul-de-sacs.

#### 4.1.2 Existing Conditions

The proposed study area is composed primarily of low-density residential communities within the McLean area with a small section of denser multiuse development within Tysons Urban Center. Both McLean and Tysons are unincorporated communities of Fairfax County. McLean was founded in 1910, when the nearby communities of Lewinsville and Langley merged, and was well established at the time I-495 was constructed in the early 1960s. Tysons was previously a rural area that developed into a commercial urban center around the time the Route 7 and Route 123 interchanges were built in the 1950s and 1960s. Tysons has seen much more rapid growth compared to other locations near the I-495 corridor and now serves as a "downtown" of Fairfax County, with one quarter of all office space and one eighth of all retail in the county.

For the purposes of this technical report, residential communities were identified based on the boundaries of community associations including homeowners or condominium unit owners associations, real estate cooperatives, and civic or citizen associations. These types of associations indicate an established neighborhood identity based on geographic location, shared community amenities such as pools or recreation centers, and other common interests. The following residential communities are within or directly adjacent to the project study area:

- Beaufort Park
- Broyhill-Langley Estates
- Elmwood Estates
- Hallcrest Heights
- Langley Forest
- Langley Oaks
- Lewinsville
- McLean Hamlet
- Parkview Hills
- Preserve at Scotts Run
- River Oaks
- Saigon
- Scotts Run
- Swinks Mill
- Timberly
- Timberly South
- Tysons Estates
- West Langley

Very few of the neighborhoods listed above existed prior to the construction of I-495; most of these neighborhoods were not fully developed until after I-495 was constructed and were platted to make full use of the land up to the I-495 right-of-way. Therefore, there was no fragmentation of these communities as a result of the construction of I-495. Today, with build-out of these areas completed, the edges of several subdivisions now directly abut the I-495 corridor.

The original I-495 Express Lanes (Springfield Interchange/I-395 to just north of the Dulles Toll Road) were built in 2012 with the goal to mitigate congestion and provide more mobility options for those in the Northern Virginia region. However, congestion at the current northern terminus of the I-495 Express Lanes often results in drivers detouring and cutting through on adjacent facilities. The resulting traffic on surrounding roads affects community mobility; roads primarily intended for local use are increasingly used by through traffic, especially during peak traffic hours (6:45–9:45 a.m. and 2:45–5:45 p.m.). Additional information regarding cut-through traffic and congestion is provided in the *I-495 Traffic and Transportation Technical Report* (VDOT, 2020b).

### 4.1.3 Environmental Consequences

#### *No Build Alternative*

In the absence of the Build Alternative improvements, continued capacity demand and congestion along I-495 could increasingly hamper community mobility along parallel facilities.

#### *Build Alternative*

The Build Alternative would not result in new fragmentation or isolation of any communities within the study area because the improvements proposed under the Build Alternative would be taking place primarily within existing right-of-way, and any changes outside of existing right-of-way would not result in community fragmentation or impacts to neighborhood connectivity or cohesion.

The Build Alternative would result in greater transportation mobility and improved congestion relief along the I-495 corridor, including local arterials.

## 4.2 COMMUNITY FACILITIES

### 4.2.1 Methodology

The community facilities impact analysis is based on the geographic location of such facilities as cemeteries, fire and rescue stations, hospitals, libraries, police stations, post offices, places of worship, schools and universities, publicly-owned parks, and community centers in relation to the proposed Build Alternative. Existing facilities were identified through a combination of research, field verification, and input from local staff. Potential effects to these resources were qualitatively assessed based on temporary or permanent impacts from construction of the project including property acquisitions and conversions, loss of parking, and access changes. Impacts to community recreational facilities such as bike paths and recreational trails were quantitatively assessed in terms of the change in access and use of the facilities.

### 4.2.2 Existing Conditions

Twelve community facilities are located within the study area, providing services to communities and neighborhoods in and around the study area (**Table 4-1** and **Figure 4-1**). No cemeteries, fire and rescue stations, hospitals, libraries, police stations, or post offices are located within the study area.

**Table 4-1. Community Facilities**

Map ID	Facility	Location	Access to/from I-495
<b><i>Places of Worship</i></b>			
1	McLean Presbyterian Church	1020 Balls Hill Road, McLean (Adjacent to NB I-495 just south of Georgetown Pike)	Georgetown Pike interchange, 0.4 miles south on Balls Hill Road
2	Holy Trinity Church	850 Balls Hill Road, McLean (Adjacent to NB I-495 just north of Georgetown Pike)	via Georgetown Pike interchange, 0.3 miles north on Balls Hill Road
3	Church of Jesus Christ of Latter-Day Saints	1325 Scotts Run Road, McLean (500 feet east of I-495 corridor, north of Lewinsville Road)	via DTR EB, exit at Route 123, turn on Lewinsville Road, 0.3 miles north on Scotts Run Road
<b><i>Organizational Centers</i></b>			
4	Sharon Masonic Temple	999 Balls Hill Road, McLean (200 feet east of I-495 corridor, just south of Georgetown Road)	via Georgetown Pike interchange, 0.2 miles south on Balls Hill Road
<b><i>Schools</i></b>			
5	Cooper Intermediate School	977 Balls Hill Rd, McLean (250 feet east of I-495 corridor, in SE corner of Balls Hill Road and Georgetown Pike)	via Georgetown Pike interchange, 0.1 miles south of Georgetown Pike
6	BASIS Independent School	8000 Jones Branch Dr, McLean (in SW quadrant of I-495 and DTR/DAAR interchange)	Via DTR, to International Drive, to Jones Branch Road (2.2 miles from I-495)
<b><i>Parks and Recreational Areas*</i></b>			
7	Scott's Run Nature Preserve	7400 Georgetown Pike, McLean (0.7 miles west of I-495)	via Georgetown Pike interchange, 0.7 miles west on Georgetown Pike
8	GWMP	McLean, VA (Along southern banks of Potomac River between I-495 and Downtown Washington, DC)	via ramp at I-495, just south of ALMB
9	Timberly Park	1173 Swinks Mill Road, McLean, VA (Adjacent to I-495 SB between Old Dominion Drive and Lewinsville Road)	via DTR EB, exit at Route 123, turn on Lewinsville Road, 1.1 miles west to Swinks Mills Road
10	McLean Hamlet Park	MacBeth Street, McLean, VA (Adjacent to DTR WB, 0.55 miles west of I-495)	via DTR WB, exit at Route 684 NB to Falstaff Road to MacBeth Street
11	Langley Swim and Tennis Club (private)	728 Live Oak Drive (200 feet west of I-495 corridor just south of GWMP)	via Georgetown Pike interchange to Ball Hill Road NB to Live Oak Drive
<b><i>Senior Living Centers</i></b>			
12	Sunrise of McClean	8315 Turning Leaf Lane, McLean (Adjacent to DTR WB, 1 mile west of I-495)	via DTR WB, exit at Route 684 NB to Turning Leaf Lane

Source: Google Earth, 2018

\* Bike and pedestrian facilities within the study area are shown in Table 4-2 and on Figure 4-2.





Figure 4-1. Community Facilities within the Study Area

**Figure 4-2** shows existing (listed on **Table 4-2**) and proposed (listed on **Table 4-3**) bike facilities in the study area, including recreational trails (multi-use), bike lanes (on-street designated lanes for bicycles), and bike routes (recommended routes for safest cycling from point A to point B). According to the *Bike Fairfax Interactive Map* (Fairfax County, 2018b), there are nine existing trail and bike facilities within the study area. In addition, according to Fairfax County's *Bike Master Plan*, four future trail and bike facilities are proposed within the study area (Fairfax County, 2014).

**Table 4-2. Existing Recreational Trails and Bicycle Facilities in the Study Area**

Name	Facility Type	Location	Description
Balls Hills Road	Shared Roadway	Along Balls Hill Road from Georgetown Pike to Churchill Road	5-foot wide concrete or asphalt sidewalk separated from the transportation right-of-way by a grassed median
Benjamin Street	Shared Roadway	East of I-495	Residential streets with low-volumes and no shoulders
Georgetown Pike	Shared Roadway	Along Georgetown Pike to east side of I-495 at Balls Hill Road	5-Foot asphalt and concrete trail connecting intersection with Cooper Middle School and multi-use trail east of Dead Run Drive used by students and community members
Lewinsville Road	Bike Lane	Along Lewinsville Road over I-495 between Timberly Lane and Scotts Run Road	5-Foot bike lanes on both sides of Lewinsville Road overpass connecting with existing asphalt trail between Balls Hill Road and Spring Hill Road
Live Oak Trail*	Trail/Sidewalk Construction	Runs north along Live Oak Drive	Extension of trail between Scott's Run Nature Preserve and GWMP
Oak Trail	Off-Street Trail	West of Live Oak Drive connecting park trails in Scott's Run Nature Preserve	6-foot wide unpaved trail connecting Potomac Heritage Trail to Scott's Run Nature Preserve
Potomac Heritage Trail*	Off-Street Trail	Within Scott's Run Nature Preserve, the GWMP and under I-495	4 to 6-foot wide unpaved trail running between GWMP to the Scott's Run Nature Preserve
Scotts Run Trail	Off-Street Trail	Along Scott Run Stream to the east, along the east side of I-495	Neighborhood recreational resource with bridge over Scott Run
Westpark Drive	Bike Lane	Parallel to I-495 at Tysons Corner Center	5-foot lane on bridge across VA-123 and wide outside lanes with shoulders to Jones Branch Drive used to connect to bike lanes west of study area on Westpark Drive

Sources: Fairfax County GIS (2018); Fairfax County Bike Master Plan (2014); Bike Fairfax Interactive Map

\*Along Live Oak Drive, the Potomac Heritage Trail and the Live Oak Trail follow the same alignment.

**Table 4-3. Proposed Recreational Trails and Bicycle Facilities in the Study Area**

Name	Facility Type	Description
Old Dominion Drive	Striped Shoulder	Crosses over I-495
Jones Branch Connector	Bike Lane/Bridge	Crosses over I-495
Jones Branch Drive Bridge	Bike Lane/Bridge	Proposed bridge and bike lane crosses over I-495 and connects to Jones Branch Drive
Beltway and Tysons Old Meadow	Shared-Use Path	Intersection of Route 123 and Old Meadow Road east of I-495 to a location near the intersection of Tysons One Place and Fashion Boulevard west of I-495

Sources: Fairfax County GIS (2018); Fairfax County Bike Master Plan (2014); Bike Fairfax Interactive Map

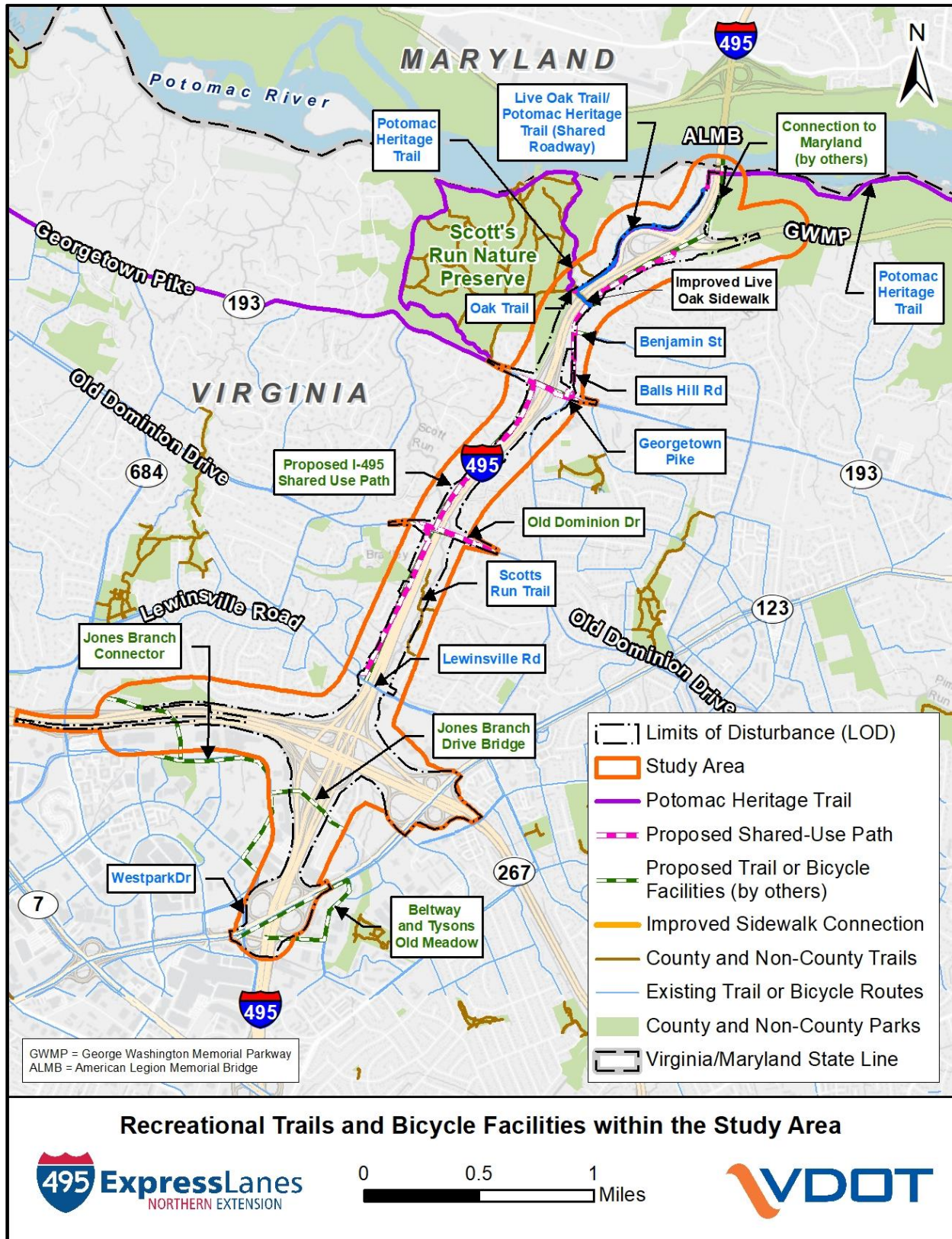


Figure 4-2. Recreational Trails and Bicycle Facilities within the Study Area

### 4.2.3 Environmental Consequences

#### **No Build Alternative**

The No Build Alternative would have no direct physical impact on community facilities in the study area. The No Build Alternative would not result in any changes to existing recreational trails, bike lanes, and bike routes within the study area.

#### **Build Alternative**

Access to community facilities would be maintained during construction of the proposed project. The proposed project would have a direct, permanent impact on the following community facilities, but would not impact recreational facilities, buildings, or parking and access:

- McLean Presbyterian Church – 0.8 acres
- Holy Trinity Church – 1.7 acres
- Scott’s Run Nature Preserve – 3.2 acres
- George Washington Memorial Parkway – To be determined through ongoing coordination with NPS
- Langley Swim and Tennis Club – 0.1 acres

Several existing recreational trails and pedestrian/bicycle facilities in the study area may be temporarily impacted during construction based on the LOD:

- Oak Trail connecting from Scott’s Run Nature Preserve to Live Oak Drive – approximately 71 feet within LOD
- Live Oak Trail (and Potomac Heritage Trail)\* – These trails primarily follow the same alignment along Live Oak Drive. The on-street portion would be realigned with the roadway, but both the road and trail would remain open during construction – approximately 4,241 feet within LOD
- Balls Hill Road – This facility is an existing sidewalk adjacent to the roadway, which would be replaced with a wider asphalt shared use path in the same location. The existing sidewalk would be temporarily closed during this portion of construction – approximately 2,579 feet within LOD
- Benjamin Street – approximately 56 feet within LOD
- Georgetown Pike – approximately 660 feet within LOD
- Lewinsville Road – approximately 730 feet within LOD\*\*\*
- Westpark Drive – approximately 540 feet within LOD\*\*\*
- Scotts Run Trail- approximately 1,568 feet within LOD\*\*\*
- Potomac Heritage Trail (off-street segment at the ALMB)\* – approximately 913 feet within LOD\*\*

\* To avoid double counting, impact numbers associated with this alignment include Live Oak Trail and Potomac Heritage Trail where they share a common alignment; 493 feet of this impact is solely the Live Oak Trail and sidewalk at the I-495 overpass.

\*\* Although the Potomac Heritage Trail is shown within the LOD, the project is not anticipated to permanently impact this resource.

The off-street portion under the ALMB would be maintained during construction.

\*\*\* Although these resources are shown within the LOD, they will not be impacted by the I-495 NEXT project.

The following proposed recreational trails and bicycle facilities located in the study area may be temporarily impacted during construction based on the LOD:

- Beltway and Tysons Old Meadow – approximately 3,086 feet within the LOD
- Jones Branch Drive Bridge – approximately 1,110 feet within the LOD
- Jones Branch Connector – approximately 314 feet within the LOD
- Old Dominion Drive – approximately 1,384 feet within the LOD

Section 4(f) does not apply to trails, paths, bikeways, and sidewalks (see 23 CFR 774.13(f)(3)(4)) that occupy a transportation right-of-way without limitation to any specific location within the right-of-way, so long as the continuity of the trail, path, bikeway, or sidewalk is maintained, and these facilities are part of the local transportation system which function primarily for transportation. A more detailed discussion of impacts and use of these properties is included in the *I-495 Section 4(f)/Section 6(f) Technical Memorandum* (VDOT, 2020c).

## 5.0 DEMOGRAPHICS AND ENVIRONMENTAL JUSTICE

### 5.1 POPULATION AND HOUSING CHARACTERISTICS

#### 5.1.1 Methodology

Population and housing characteristics have been identified based on the 2010 US Decennial Census (US Census Bureau, 2010) and American Community Survey (ACS) 5-Year 2014-2018 data (ACS, 2018), available online at American Factfinder. ACS data is a sampling of the population, as opposed to the decennial Census, a per person/per household capture effort. The use of sampling makes small area census data less precise. However, the ACS data sources are more recent, are the most comprehensive published data sources, and are relied on by VDOT and FHWA for comprehensive analyses. Therefore, a combination of decennial Census data and ACS data is presented for this analysis. Data was gathered for the census block groups within and immediately adjacent to the study area. This area is referred to as the Demographic Study Area and was used for comparison with McLean, Tysons, and Fairfax County. McLean and Tysons are Census Designated Places<sup>3</sup>.

A total of 13 block groups describe the study area; however, Census Tract 4701, Block Group 2 was not included within the population and housing analysis due to the lack of any residential or other development in that portion of the block group (**Figure 5-1**). Therefore, the Demographic Study Area includes only the 12 populated block groups. Population projections are based on Metropolitan Washington Council of Governments (MWCOG) data (MWCOG, 2018). No direct long-term or short-term impacts to population and housing were calculated for the Build Alternative because no residential relocations are anticipated.

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<sup>3</sup> Designated Places (CDPs) are the statistical counterparts of incorporated places, and are delineated to provide data for settled concentrations of population that are identifiable by name but are not legally incorporated under the laws of the state in which they are located ([www.census.gov](http://www.census.gov)).

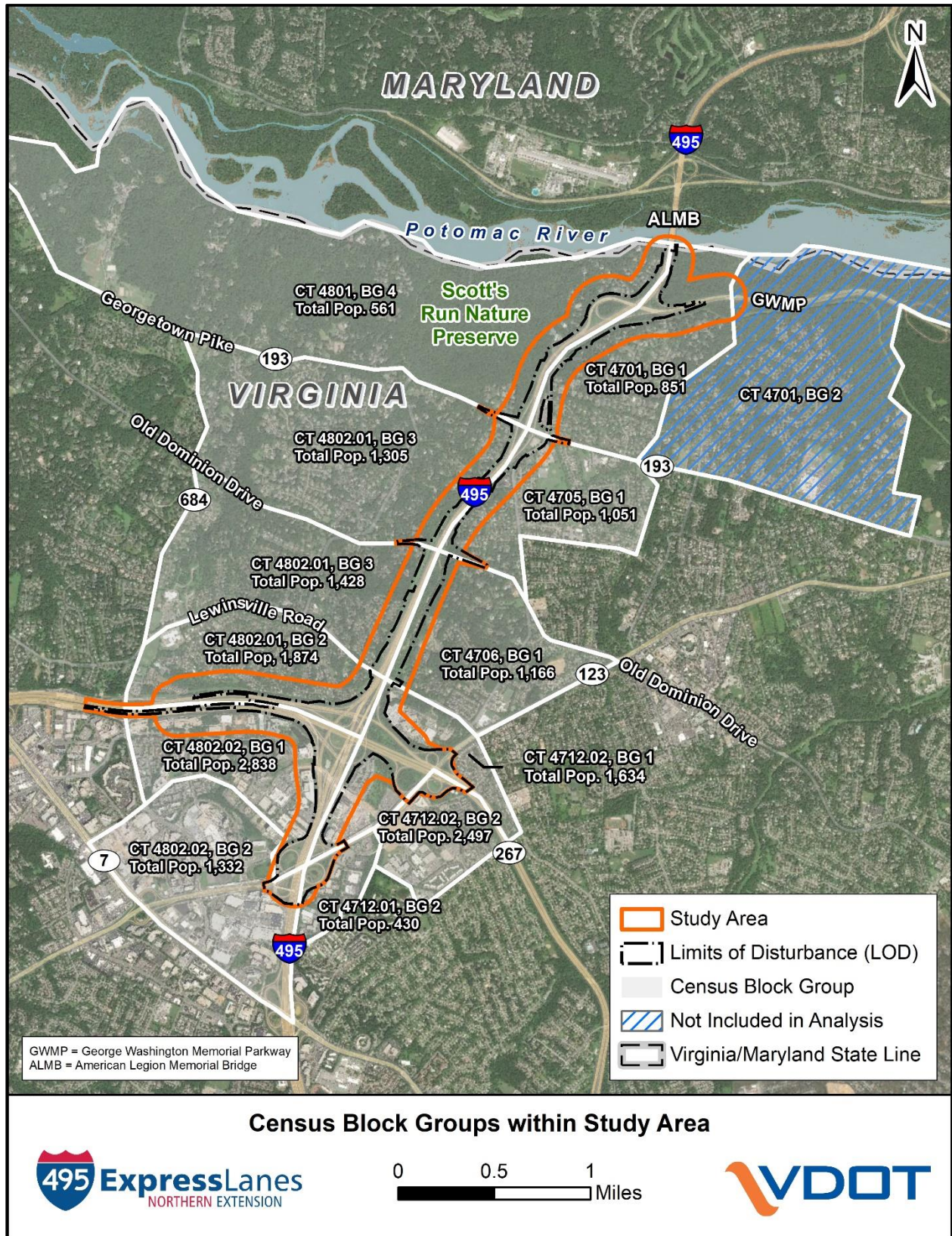


Figure 5-1. Census Block Groups within the Demographic Study Area

### 5.1.2 Existing Conditions

#### Population

**Table 5-1** summarizes the Demographic Study Area population by census tract (CT) and block group (BG) and compares them with Fairfax County, McLean, and Tysons.

**Table 5-1. Total Population Within the Demographic Study Area**

Geographic Area	Total Population
<b>Fairfax County</b>	<b>1,143,529</b>
<b>McLean</b>	<b>47,075</b>
<b>Tysons</b>	<b>23,749</b>
CT 4701, BG 1	828
CT 4705, BG 1	1,193
CT 4706, BG 1	1,098
CT 4712.01, BG 2	367
CT 4712.02, BG 1	1,641
CT 4712.02, BG 2	2,368
CT 4801, BG 4	527
CT 4802.01, BG 1	1,456
CT 4802.01, BG 2	1,996
CT 4802.01, BG 3	1,120
CT 4802.02, BG 1	3,195
CT 4802.02, BG 2	1,695
<b>Total within the Demographic Study Area</b>	<b>17,484</b>

Source: 2014-2018 ACS 5-Year Estimate

CT = Census Tract; BG = Block Group

MWCOG projects population per transportation analysis zone (TAZ)<sup>4</sup> from 2010 to 2045. The current MWCOG Round 9.1 projections<sup>5</sup> indicate that by 2045, the resident population of the TAZs touching the study area will increase an average of 2.4% annually (from 22,078 in 2010 to 50,723 persons in 2045), with the largest percent increases (as high as 30% annually) projected to occur in the TAZs in the Tysons area (**Figure 5-2**). In comparison, the MWCOG Round 9.1 projections anticipate the resident population of Fairfax County will increase an average of 0.7% annually (from 1,162,545 in 2010 to 1,469,595 persons in 2045) (MWCOG, 2018). This data indicates that the population of the entire area surrounding the project is anticipated to grow on average at a rate nearly four times that of the overall county, and the fastest growing areas in Tysons are anticipated to grow at a rate exceeding thirty times that of the overall county.

<sup>4</sup> Transportation analysis zone (TAZ) is the unit of geography most commonly used in conventional transportation planning models. The size of a zone varies, but for a typical metropolitan planning software, a zone of under 3,000 people is common (Transportation Research Board).

<sup>5</sup> MWCOG Cooperative Forecasting Program provides regularly updated population, household, and employment forecasts for use in planning and modeling activities at COG, the Transportation Planning Board, and other state, regional, and local agencies (MWCOG, 2018).



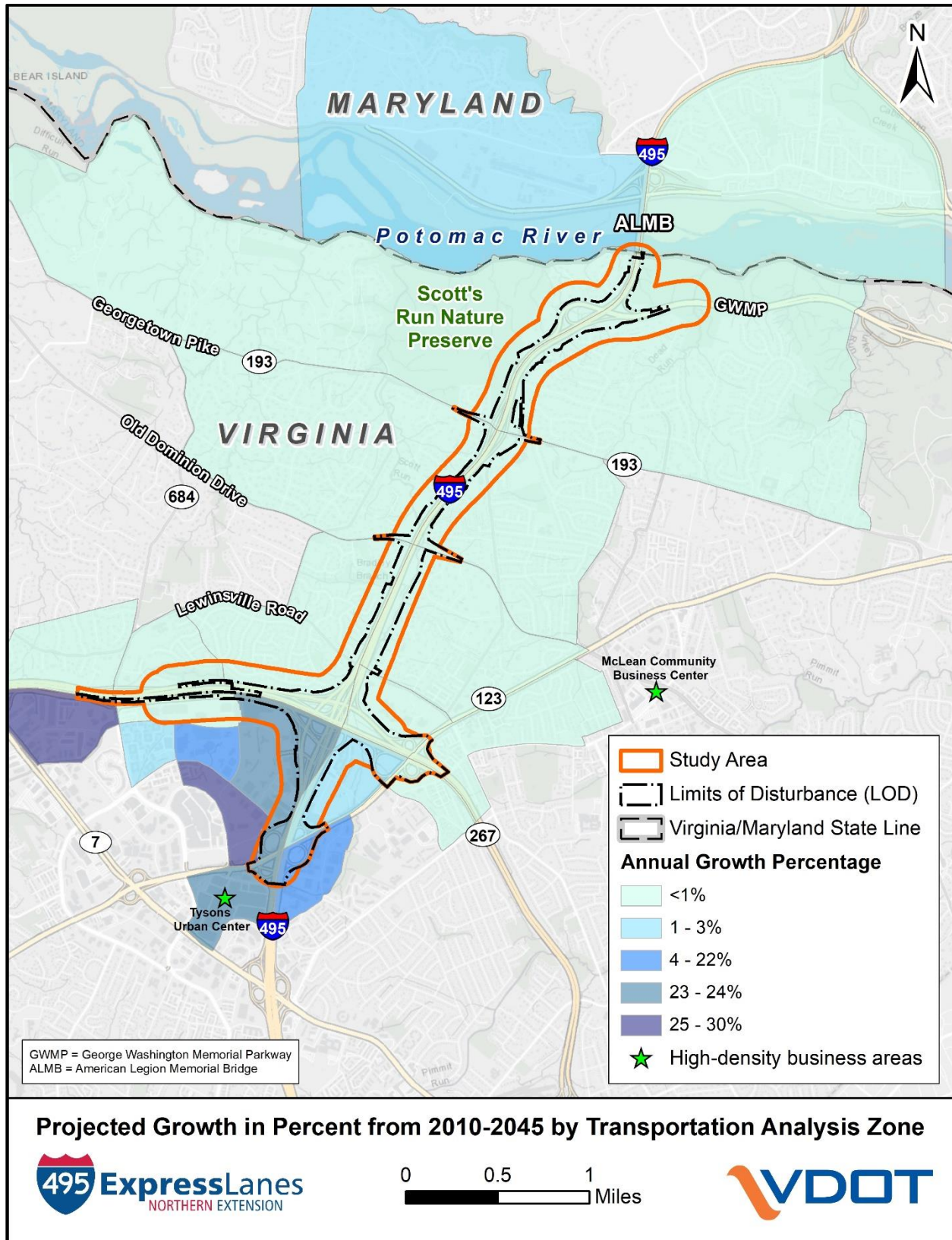


Figure 5-2. Projected Residential Growth by Traffic Analysis Zone (2010 – 2045)

### Housing

**Table 5-2** shows housing characteristics in the Demographic Study Area based on the 2010 Decennial Census data. In the Demographic Study Area, approximately 96% of the housing units are occupied, with four block groups at 100% occupancy. A mix of housing types occurs in the Demographic Study Area ranging from detached single-family homes and townhouses to apartment buildings.

Much of the areas within the north part of the study area—including in Scott’s Run Nature Preserve, land owned by the Fairfax County Park Authority, and land along the GWMP—have few to no housing units. Most housing is on the west side of the study area south of Old Dominion Drive, the west side between Spencer Court and Georgetown Pike, the east side between Lewinsville Road and the end of Scotts Run Road, and the east side from Old Dominion Drive to the GWMP.

**Table 5-2. Housing Characteristics Within the Demographic Study Area**

Geographic Area/Census Block Group	Total Housing Units	Total Occupied Housing Units	Total Occupied Housing	Owner Occupied Units	Renter Occupied Units
<b>Fairfax County</b>	<b>407,998</b>	<b>391,627</b>	<b>95%</b>	<b>70%</b>	<b>31%</b>
<b>McLean</b>	<b>17,756</b>	<b>17,063</b>	<b>94%</b>	<b>85%</b>	<b>15%</b>
<b>Tysons</b>	<b>10,637</b>	<b>9,481</b>	<b>92%</b>	<b>46%</b>	<b>54%</b>
CT 4701, BG 1	295	277	94%	91%	9%
CT 4705, BG 1	442	426	100%	87%	13%
CT 4706, BG 1	395	374	92%	89%	11%
CT 4712.01, BG 2	297	269	85%	71%	29%
CT 4712.02, BG 1	904	863	88%	48%	52%
CT 4712.02, BG 2	1,028	994	93%	31%	69%
CT 4801, BG 4	226	214	84%	94%	6%
CT 4802.01, BG 1	534	512	100%	95%	5%
CT 4802.01, BG 2	549	537	95%	91%	9%
CT 4802.01, BG 3	472	458	100%	95%	5%
CT 4802.02, BG 1	1,420	1,062	88%	29%	71%
CT 4802.02, BG 2	843	734	90%	20%	80%
<b>Total within the Demographic Study Area</b>	<b>7,405</b>	<b>6,720</b>	<b>93%</b>	<b>70%</b>	<b>30%</b>

Source: 2010 Decennial Census Data  
CT = Census Tract; BG = Block Group

### 5.1.3 Environmental Consequences

#### *No Build Alternative*

The No Build Alternative would not result in any property acquisitions or project-related construction and therefore no impacts to population or housing would occur.

### **Build Alternative**

No residential relocations are proposed. All existing access to the corridor would be maintained throughout construction, and this project would not increase exposure to new properties. Therefore, no long-term effects to population or housing would result.

## **5.2 ENVIRONMENTAL JUSTICE**

### **5.2.1 Methodology**

Title VI of the Civil Rights Act of 1964, as amended, requires that no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance. Title VI bars intentional discrimination, as well as disparate impact discrimination (i.e., a neutral policy or practice that has an unequal impact on protected groups). The FHWA Technical Advisory T6640.8A *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* implements Title VI in assessing environmental effects. It states the following:

“The “general population served and/or affected (city, county, etc.) by the proposed action should be identified by race, color, national origin, and age” and identify if there are foreseeable impacts on “general social groups specially benefitted or harmed by the proposed project” including “effects of a project on the elderly, handicapped, non-drivers, transit-dependent, and minority and ethnic groups” (FHWA, 1987).”

The FHWA Title VI Program is broader than the Title VI statute and encompasses other nondiscrimination statutes and authorities, including:

- Section 162(a) of the Federal-Aid Highway Act of 1973 (23 USC 324) providing protection against gender-based discrimination
- The Age Discrimination Act of 1975 prohibiting discrimination on the basis of age;
- Section 504 of the Rehabilitation Act of 1973 / Americans with Disabilities Act of 1990 providing disabled individuals equal opportunities to participate in and have access to federal programs, benefits, and services
- Executive Order 13166, *Improving Access to Services for Persons with Limited English Proficiency*, requiring federal agencies to identify any need for services to those with limited understanding of the English language and
- Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations* (1994), to ensure federal programs do not result in disproportionately high and adverse environmental or health impacts to these populations.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*, requires all federal agencies to:

“...promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities’ access to public information on, and an opportunity for public participation in, matters relating to human health or the environment.”

This Environmental Justice (EJ) analysis has been prepared in accordance with the definitions, methodologies, and guidance provided in Executive Order 12898; the Council on Environmental Quality (CEQ) *Environmental Justice Guidance Under the National Environmental Policy Act* (1997); US Department of Transportation (USDOT) Order 5610.2(a) *Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (2012 revision); FHWA EJ Order 6640.23A *FHWA Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (2012); FHWA memorandum *Guidance on Environmental Justice and NEPA* (2011); the FHWA *Environmental Justice Reference Guide* (2015); and FHWA Technical Advisory T6640.8A: *Guidance for Preparing and Processing Environmental and Section 4(f) Documents*. The strategies developed under Executive Order 12898 and the USDOT and FHWA policies on EJ take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal transportation projects on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law, while ensuring EJ communities are proactively provided meaningful opportunities for public participation in project development and decision-making.

### ***Identification of Environmental Justice Populations***

The methods of identifying environmental justice populations have been generally agreed upon by VDOT, FHWA, and the U.S. Environmental Protection Agency (EPA) to be used on all VDOT NEPA studies and are summarized in this section. Executive Order 12898 itself does not define the terms “minority” or “low-income,” but these terms have been defined in the USDOT and FHWA EJ Orders as below and will be used in this EJ analysis:

- **Minority Individual**—The USDOT and FHWA EJ Orders define a minority individual as belonging to one of the following groups: (1) Black: a person having origins in any of the black racial groups of Africa; (2) Hispanic or Latino: a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race; (3) Asian American: a person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent; (4) American Indian and Alaskan Native: a person having origins in any of the original people of North America, South America (including Central America), and who maintains cultural identification through Tribal affiliation or community recognition; or (5) Native Hawaiian and Other Pacific Islander: a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.
- **Low-Income Individual**—The FHWA and USDOT EJ Orders define a “low-income” individual as a person whose median household income is at or below the Department of Health and Human Services (HHS) poverty guidelines. While the 2019 HHS poverty guidelines are available, the 2018 guidelines are appropriate to be used for consistent comparison to the latest available 2014-2018 ACS Median Household Income in the Past 12 Months (in 2018 Inflation-adjusted Dollars) data available at the census block group level. The 2018 HHS poverty guidelines for persons living in the contiguous 48 states and District of Columbia (DC) will therefore be used and are presented in **Table 5-3**.

**Table 5-3. 2018 Health and Human Services Poverty Guidelines**

Persons in Family/Household	Poverty Guideline
1	\$12,490
2	\$16,910
3	\$21,330
4	\$25,750
5	\$30,170
6	\$34,590
7	\$39,010
8	\$43,430

Source: U.S. Department of Health and Human Services, 2019

Using the Executive Order 12898 and the USDOT and FHWA EJ Orders definitions as the basis for identifying minority and low-income populations, the proposed project EJ analysis is based on the following population definitions:

- Minority Populations**—Any readily identifiable groups of minority persons who live in geographic proximity, and if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed USDOT/FHWA program, policy, or activity (USDOT and FHWA EJ Orders). A minority population is present when: (a) the minority population of the affected area exceeds 50% of total population or (b) the minority population percentage in the affected area is “meaningfully greater” than the minority population percentage in the general population or other appropriate unit of geographical analysis (CEQ, 1997). For the purposes of this study, the minority population for a census block group within the Demographic Study Area would be found to be “meaningfully greater” if its minority population is greater than the value of the average minority population percentage of the MWCOG member localities or the average minority population percentage of Fairfax County, whichever establishes the lower and more conservative threshold (shown in **Table 5-4**).

The average minority population percentage of Fairfax County is 45.4%, which is a lower and more conservative threshold than the average of the MWCOG planning area (51.4%). Therefore, Demographic Study Area block groups with an average minority population percentage greater than 45.4% are considered minority populations.

- Low-Income Population**—Any readily identifiable group of low-income persons who live in geographic proximity, and, if circumstances warrant, geographically dispersed/transient persons (such as migrant workers or Native Americans) who would be similarly affected by a proposed USDOT/FHWA program, policy, or activity (USDOT/FHWA EJ Orders). A low-income population is defined as a block group for which the median household income is below the most current U.S. Department of Health and Human Services poverty guidelines for the average household size in that block group.

The block groups selected for analysis of direct effects to EJ populations are populated block groups within or immediately adjacent to the study area, as defined by the Demographic Study Area. The 2010 Decennial Census does not provide information related to median household income; therefore, to produce a more accurate comparison to the 2016 household size, the 2014-2018 ACS 5-Year data was used to identify low-income populations. While the ACS 5-Year estimates include data on race and ethnicity, the 2010 Decennial Census provides more accurate minority resident counts than those available from the ACS, which is a sample with sometimes large margins of error. Therefore, 2010 Decennial Census minority data was used to identify minority populations within the Demographic Study Area block groups in accordance with the accepted VDOT methodology.

## 5.2.2 Existing Conditions

### Minority Populations

**Table 5-4** and **Figure 5-3** identify the census block groups meeting the definition of a minority population. As described above, block groups with an average minority population percentage greater than that of Fairfax County (45.4%) are considered to have minority populations. Based on this threshold, one census block group meets the definition of a racial minority population: CT 4712.02, BG 2, has a total minority population of 52.5%, which primarily includes Asian (31%), Hispanic or Latino (11.3%), and Black or African American (6.3%).

**Table 5-5** presents the detailed race and ethnicity data of residents according to the 2010 Decennial Census data.

**Table 5-4. Minority Population Summary Within the Demographic Study Area**

	Total Population	Total Nonwhite	Total Nonwhite (%)	Minority Population Present?
Washington D.C. MSA	5,582,170	2,870,912	51.4	
Fairfax County, Virginia	1,081,699	491,077	45.4	
McLean CDP	48,115	11,842	24.6	
Tysons CDP	19,627	8,811	44.9	
CT 4701, BG 1	857	147	17.2	No
CT 4705, BG 1	1,253	435	34.7	No
CT 4706, BG 1	1,014	289	28.5	No
CT 4712.01, BG 2	431	100	23.2	No
CT 4712.02, BG 1	1,623	716	44.1	No
CT 4712.02, BG 2	2,206	1,158	52.5	Yes
CT 4801, BG 4	712	211	29.6	No
CT 4802.01, BG 1	1,580	414	26.2	No
CT 4802.01, BG 2	1,673	444	26.5	No
CT 4802.01, BG 3	1,339	285	21.3	No
CT 4802.02, BG 1	1,610	706	43.9	No
CT 4802.02, BG 2	1,361	577	42.4	No

Source: 2010 Decennial Census

MWCOG = Metropolitan Washington Council of Government; CDP = Census Designated Place; CT = Census Tract; BG = Block Group

**Table 5-5. Minority Population Detail Within the Demographic Study Area**

	White, Not Hispanic or Latino (%)	Hispanic or Latino (%)	Black or African American (%)	American Indian and Alaska Native (%)	Asian (%)	Native Hawaiian and Pacific Islander (%)	Some Other Race (%)	Two or More Races (%)	Total Nonwhite (%)	Minority Population Present?
Washington D.C. MSA	48.6	13.8	25.2	0.2	9.2	0.1	0.3	2.6	51.4	
Fairfax County, Virginia	54.6	15.6	8.9	0.2	17.4	0.1	0.3	2.9	45.4	
McLean CDP	75.4	4.9	1.8	0.1	14.9	0.0	0.4	2.7	24.6	
Tysons CDP	55.1	8.1	4.7	0.1	27.4	0.1	0.4	4.1	44.9	
CT 4701, BG 1	82.8	5.4	2.1	0.1	8.3	0.0	0.2	1.1	17.2	No
CT 4705, BG 1	65.3	6.1	1.8	0.2	21.9	0.1	0.2	4.3	34.7	No
CT 4706, BG 1	71.5	4.7	1.4	0.0	17.0	0.0	0.5	4.9	28.5	No
CT 4712.01, BG 2	76.8	9.0	3.9	0.0	6.5	0.0	0.2	3.5	23.2	No
CT 4712.02, BG 1	55.9	6.7	3.1	0.0	30.1	0.1	0.6	3.7	44.1	No
CT 4712.02, BG 2	47.5	11.3	6.3	0.3	31.0	0.4	0.3	2.8	52.5	Yes
CT 4801, BG 4	70.4	4.8	4.4	0.0	15.0	0.0	0.7	4.8	29.6	No
CT 4802.01, BG 1	73.8	3.5	2.2	0.1	16.6	0.0	0.2	3.6	26.2	No
CT 4802.01, BG 2	73.5	4.2	1.7	0.2	17.9	0.0	0.2	2.3	26.5	No
CT 4802.01, BG 3	78.7	3.4	1.1	0.2	14.1	0.0	0.5	1.9	21.3	No
CT 4802.02, BG 1	56.1	5.2	4.0	0.2	30.1	0.1	0.3	4.0	43.9	No
CT 4802.02, BG 2	57.6	6.0	5.7	0.0	26.9	0.0	0.1	3.7	42.4	No

Source: 2010 Decennial Census

MWCOG = Metropolitan Washington Council of Government; CDP = Census Designated Place; CT = Census Tract; BG = Block Group



CT = Census Tract; BG = Block Group

**Figure 5-3. Minority Populations Above Fairfax County Average**



**Low-Income Populations**

**Table 5-6** considers census block groups meeting the definition of a minority population. As described above, the most recent available median household income and average household size data from ACS (ACS, 2018) was used to identify low-income populations within the Demographic Study Area block groups. Average household size was rounded to the nearest whole number. None of the block groups within the Demographic Study Area have a median household income lower than the HHS poverty guideline for the average household size. Therefore, there are no low-income populations in the study area.

**Table 5-6. Median Household Income Within the Demographic Study Area**

	Average Household Size	Total Population	Median household income	HHS Poverty Guideline for Household Size	Low-Income Population Present?
<b>Washington DC MSA</b>	<b>3</b>	<b>6,138,382</b>	<b>\$100,732,</b>	<b>\$21,330</b>	N/A
<b>Fairfax County, Virginia</b>	<b>3</b>	<b>1,143,529</b>	<b>\$121,133</b>	<b>\$21,330</b>	N/A
<b>McLean CDP</b>	<b>3</b>	<b>47,075</b>	<b>\$201,570</b>	<b>\$21,330</b>	N/A
<b>Tysons CDP</b>	<b>2</b>	<b>23,749</b>	<b>\$102,072,</b>	<b>\$16,910</b>	N/A
CT 4701, BG 1	3	828	\$224,350	\$21,330	No
CT 4705, BG 1	3	1,193	\$250,000+	\$21,330	No
CT 4706, BG 1	3	1,098	\$209,896	\$21,330	No
CT 4712.01, BG 2	2	367	\$118,889	\$16,910	No
CT 4712.02, BG 1	2	1,641	\$117,563	\$16,910	No
CT 4712.02, BG 2	3	2,368	\$117,938	\$21,330	No
CT 4801, BG 4	3	527	\$247,813	\$21,330	No
CT 4802.01, BG 1	3	1,456	\$181,797,	\$21,330	No
CT 4802.01, BG 2	3	1,996	\$250,000+	\$21,330	No
CT 4802.01, BG 3	3	1,120	\$250,000+	\$21,330	No
CT 4802.02, BG 1	2	3,195	\$82,674	\$16,910	No
CT 4802.02, BG 2	2	1,695	\$129,141	\$16,910	No
<b>Weighted Average of Median Household Income within the Demographic Study Area</b>			<b>\$165,159</b>		

Source: 2014-2018 ACS 5-Year Estimate and 2018 HHS Poverty Guidelines

HHS = U.S. Department of Health and Human Services; MSA = Metropolitan Statistical Area

CDP = Census Designated Place; CT = Census Tract; BG = Block Group; N/A= Not Applicable

**5.2.3 Environmental Consequences****No Build Alternative**

The No Build Alternative would not result in any property acquisitions. The minority population identified in CT 4710.02, BG 2 could likely experience the same congested conditions and unreliable travel times as the overall population.

### ***Build Alternative***

All of the identified census block groups within the Build Alternative's Demographic Study Area contain minority residents; however, only one meets the established threshold for minority populations, and none qualify as low-income populations. The proposed improvements would take place primarily within the existing right-of-way. No residential or commercial relocations would occur under this alternative. The Build Alternative would not result in new fragmentation or isolation of any communities within the study area. Therefore, no disproportionately high or adverse impacts to EJ populations would occur.

Temporary easements for construction are anticipated to be short-term and would not preclude access to or impact use of properties; therefore, potential temporary right-of-way effects during construction are not considered disproportionately high or adverse to EJ populations. The improved transportation mobility and reduced congestion that would occur under the Build Alternative could benefit all users of I-495, including the minority population identified in CT 4710.02, BG 2.

## **6.0 ECONOMICS**

### **6.1 METHODOLOGY**

This economic analysis focuses on income, employment, and travel patterns in the study area. Specifically, economic data is collected by either census tracts or block groups within or immediately adjacent to the study area, as defined by the Demographic Study Area. Sources include the ACS 5-Year Estimates data for 2014-2018 (ACS, 2018). No business relocations would result from the Build Alternative; impact to the economy is based on anticipated changes in travel time and reliability, which is an indicator for the attractiveness of the area for development and travelers. .

### **6.2 EXISTING CONDITIONS**

#### ***Income***

Median household income within the Demographic Study Area (**Table 5-6**) (\$200,246) is greater than Fairfax County (\$114,329), McLean (\$190,258) and Tysons (\$96,446).

#### ***Employment***

Data for labor force and employment (ACS, 2018) is summarized in **Table 6-1**. The total population currently in the civilian workforce in the Demographic Study Area is 9,974 people. In the surrounding region, more than 3.5 million people are currently in the labor force, which is anticipated to grow to 4.5 million people by 2045 (MWCOG, 2018). As defined by the ACS, the civilian labor force includes the civilian population 16 years of age or older working as paid employees, the self-employed (including farmers), or those who worked 15 hours or more as unpaid workers for a family farm/business. Excluded from the labor force are those over 16 years of age who are students, homemakers, and unpaid volunteers, retirees, those institutionalized, or those who worked less than 15 hours a week as an unpaid worker for a family farm/business. The unemployed are over 16 years of age and not currently working but actively looking for work, and generally available to work.

**Table 6-1. Unemployment Characteristics Within the Demographic Study Area**

<b>Geographic Area / Census Block Group</b>	<b>Population in Civilian Labor Force</b>	<b>Percent Unemployed</b>
<b>Washington D.C. MSA</b>	<b>3,533,654</b>	<b>4.7%</b>
<b>Fairfax County</b>	<b>643,586</b>	<b>3.7%</b>
<b>McLean</b>	<b>20,556</b>	<b>2.7%</b>
<b>Tysons</b>	<b>15,540</b>	<b>11.9%</b>
CT 4701, BG 1	344	9.6%
CT 4705, BG 1	478	0.0%
CT 4706, BG 1	597	1.3%
CT 4712.01, BG 2	236	12.3%
CT 4712.02, BG 1	1,084	1.6%
CT 4712.02, BG 2	1,492	2.3%
CT 4801, BG 4	230	13.0%
CT 4802.01, BG 1	556	6.1%
CT 4802.01, BG 2	984	1.4%
CT 4802.01, BG 3	616	1.9%
CT 4802.02, BG 1	2,051	5.4%
CT 4802.02, BG 2	1,306	1.0%
<b>Total within the Demographic Study Area</b>	<b>9,974</b>	<b>3.4%</b>

Source: 2014-2018 ACS 5-Year Estimate  
 CT = Census Tract; BG = Block Group

**Table 6-2** lists the number of employees in each employment sector. This detailed data is not available at the census block group level; therefore, the data is listed by census tracts. The majority of the employed civilian population in the Demographic Study Area is in professional, scientific, management, administrative, and waste management (35%) and educational services, health care, and social assistance (17%). Fairfax County has the same highest two employment sectors. According to the Fairfax County Economic Development Authority, the top employers in Fairfax County include Inova Health System, Booz Allen Hamilton, Capital One, Freddie Mac, SAIC, Amazon, Constellis, Deloitte, General Dynamics, The MITRE Corporation, Navy Federal Credit Union, Northrop Grumman, and Perspecta (FCEDA, 2019).

**Table 6-2. Employees Within the Demographic Study Area by Industry**

	Washington D.C MSA	Fairfax County	McLean CDP	Tysons CDP	CT 4701	CT 4705	CT 4706	CT 4712.01	CT 4712.02	CT 4801	CT 4802.01	CT 4802.02	Demographic Study Area Census Tracts
<b>Civilian Employed Population 16 Years and Older</b>	<b>3,278,163</b>	<b>611,628</b>	<b>21,389</b>	<b>13,609</b>	<b>1,077</b>	<b>2,360</b>	<b>1,358</b>	<b>2,037</b>	<b>3,136</b>	<b>1,608</b>	<b>2,096</b>	<b>3,233</b>	<b>16,905</b>
Professional, Scientific, Management, Administrative, and Waste Management Services	<b>686,687</b>	<b>154,463 (25%)</b>	<b>7,103</b>	<b>4,959</b>	333	836	418	589	1,116	505	795	1,396	<b>5,988 (35%)</b>
Educational Services, and Health Care and Social Assistance	<b>645,144</b>	<b>111,875 (18%)</b>	<b>3,869</b>	<b>2,089</b>	195	379	207	298	611	332	531	347	<b>2,900 (17%)</b>
Public Administration	<b>416,129</b>	<b>69,677 (12%)</b>	<b>2,992</b>	<b>1,533</b>	165	375	166	183	371	164	186	247	<b>1,857 (11%)</b>
Finance and Insurance, Real Estate, and Rental and Leasing	<b>202,304</b>	<b>41,170 (6.8%)</b>	<b>1,847</b>	<b>1,343</b>	160	179	147	289	207	198	182	503	<b>1,865 (11%)</b>
Arts, Entertainment, and Recreation, Accommodation, and Food Services	<b>284,256</b>	<b>53,730 (8.7%)</b>	<b>1,217</b>	<b>853</b>	39	182	67	130	224	74	92	178	<b>986 (5.8%)</b>
Retail Trade	<b>266,664</b>	<b>46,825 (7.9%)</b>	<b>697</b>	<b>733</b>	6	52	106	142	124	85	10	162	<b>687 (6%)</b>
Other Services, except Public Administration	<b>207,818</b>	<b>39,238 (6.3%)</b>	<b>1,385</b>	<b>736</b>	70	109	99	126	379	129	89	111	<b>1,112 (6.6%)</b>
Manufacturing	<b>92,505</b>	<b>15,715 (2.7%)</b>	<b>628</b>	<b>330</b>	30	26	69	42	14	66	70	64	<b>381 (2.3%)</b>
Information	<b>86,674</b>	<b>16,746 (2.9%)</b>	<b>702</b>	<b>402</b>	39	151	31	81	13	28	70	85	<b>498 (3%)</b>
Construction	<b>211,167</b>	<b>34,287 (5.8%)</b>	<b>496</b>	<b>232</b>	23	71	16	71	21	9	20	55	<b>286 (1.7%)</b>
Wholesale Trade	<b>39,464</b>	<b>6,484 (1%)</b>	<b>138</b>	<b>190</b>	0	0	9	25	16	7	9	47	<b>113 (0.7%)</b>
Transportation and Warehousing, and Utilities	<b>128,809</b>	<b>20,363 (3%)</b>	<b>269</b>	<b>186</b>	17	0	23	61	40	11	42	24	<b>218 (1%)</b>
Agriculture, Forestry, Fishing, Hunting, and Mining	<b>10,252</b>	<b>1,055 (0.2%)</b>	<b>46</b>	<b>23</b>	0	0	0	0	0	0	0	14	<b>14 (0.1%)</b>

Source: 2014-2018 ACS 5-Year Estimates. MSA = Metropolitan Statistical Area; CDP = Census Designated Place; CT = Census Tract

**Travel to Work**

Commuter “means of transportation” data for the workforce living in the Demographic Study Area is summarized in **Table 6-3** (ACS, 2018). Most commuters originating in the Demographic Study Area commute alone by car, truck, or van (71.9%), similar to Fairfax County, McLean, and Tysons.

**Table 6-3. Means of Transportation to Work Within the Demographic Study Area**

Location	Total Commuters	Total Car / Truck / Van Alone	Carpool	Public Transit	Walk	Other	Work at home
<b>Washington D.C MSA</b>	<b>3,256,881</b>	<b>66%</b>	<b>9.4%</b>	<b>13.6%</b>	<b>3.3%</b>	<b>0.8%</b>	<b>5.6%</b>
<b>Fairfax County</b>	<b>610,395</b>	<b>70.7%</b>	<b>9.6%</b>	<b>9.7%</b>	<b>1.9%</b>	<b>0.9%</b>	<b>6.4%</b>
<b>McLean</b>	<b>21,175</b>	<b>72.8%</b>	<b>6.7%</b>	<b>5.9%</b>	<b>1.4%</b>	<b>0.9%</b>	<b>11.2%</b>
<b>Tysons</b>	<b>13,358</b>	<b>70.4%</b>	<b>4.6%</b>	<b>12.8%</b>	<b>4.1%</b>	<b>1.1%</b>	<b>6.7%</b>
CT 4701, BG 1	309	77.7%	0.6%	1.9%	1.6%	7.4%	10.7%
CT 4705, BG 1	514	79.6%	2.1%	0%	2.9%	0%	15.4%
CT 4706, BG 1	582	72.7%	5.7%	4.1%	0.4%	4.6%	12.7%
CT 4712.01, BG 2	207	95.2%	0%	0%	4.8%	0%	0%
CT 4712.02, BG 1	1,084	73.2%	3.4%	17.3%	1.4%	0%	4.7%
CT 4712.02, BG 2	1,411	59.7%	9.0%	17.5%	8.6%	0%	5.2%
CT 4801, BG 4	200	88.5%	0%	0%	0%	0%	6.5%
CT 4802.01, BG 1	489	63.8%	5.3%	0%	0%	0%	30.9%
CT 4802.01, BG 2	978	73.6%	3.4%	9.3%	0%	0%	12.6%
CT 4802.01, BG 3	585	74.4%	6.5%	4.1%	0%	1.4%	13.7%
CT 4802.02, BG 1	1,898	65.4%	0.7%	12.9%	8.4%	1.0%	11.4%
CT 4802.02, BG 2	1,309	64.9%	3.8%	15.6%	8.6%	0%	7.1%
<b>Demographic Study Area</b>	<b>10,785</b>	<b>80.6%</b>	<b>3.9%</b>	<b>7.3%</b>	<b>3.2%</b>	<b>1.7%</b>	<b>11.2%</b>

Source: 2014-2018 ACS 5-Year Estimates

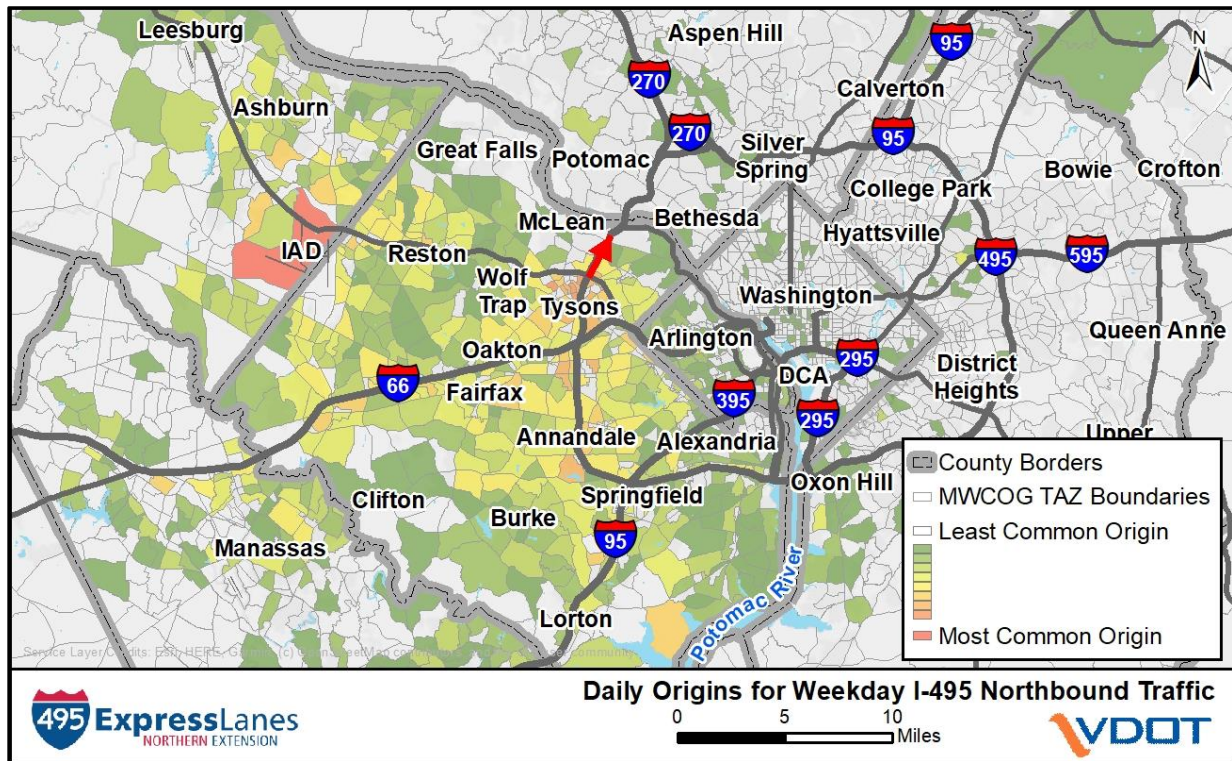
MSA= Metropolitan Statistical Area; CT = Census Tract; BG = Block Group

I-495 is a major regional route connecting employees to jobs and production to consumption sites within the study area and throughout the Washington, D.C. region. Travel patterns along I-495 in the study area were analyzed using data from StreetLight, a provider of anonymized mobile device analytics to support transportation studies. This analysis showed that trips through the project corridor have a wide-ranging set of origins and destinations well outside the Demographic Study Area. **Figure 6-1** through **Figure 6-4** graph the origin and destination distribution for average weekday traffic on I-495 (StreetLight, 2018).

As shown by the orange and red colorings on **Figure 6-1** and **Figure 6-2**, some of the most common origins for I-495 northbound traffic through the study area are Tysons, Dulles International Airport, and the I-95 corridor. Northbound I-495 traffic through the study area is predominately destined for the communities around the I-95/I-270 interchange (shown by the orange and red colorings on **Figure 6-3**). Two of the most common destinations for southbound traffic along I-495 through the study area (shown by the orange and

red colorings on **Figure 6-4**) are the airport and Tysons; I-495 provides the main north-south regional transportation link into and out of Tysons.

Travel speeds along I-495 within the study area for both the GP and the Express Lanes are highly inconsistent and can vary substantially by hour and by day, with the slowest speeds and heaviest queues occurring along I-495 northbound during both AM and PM peak periods. All users of I-495 within the study area are equally affected by variable travel speeds and times, including single occupancy, high occupancy vehicle (HOV), transit, and freight vehicles. More detail is in the *I-495 Traffic and Transportation Technical Report* (VDOT, 2020b).



**Figure 6-1. Daily Origins for Weekday I-495 Northbound Traffic**

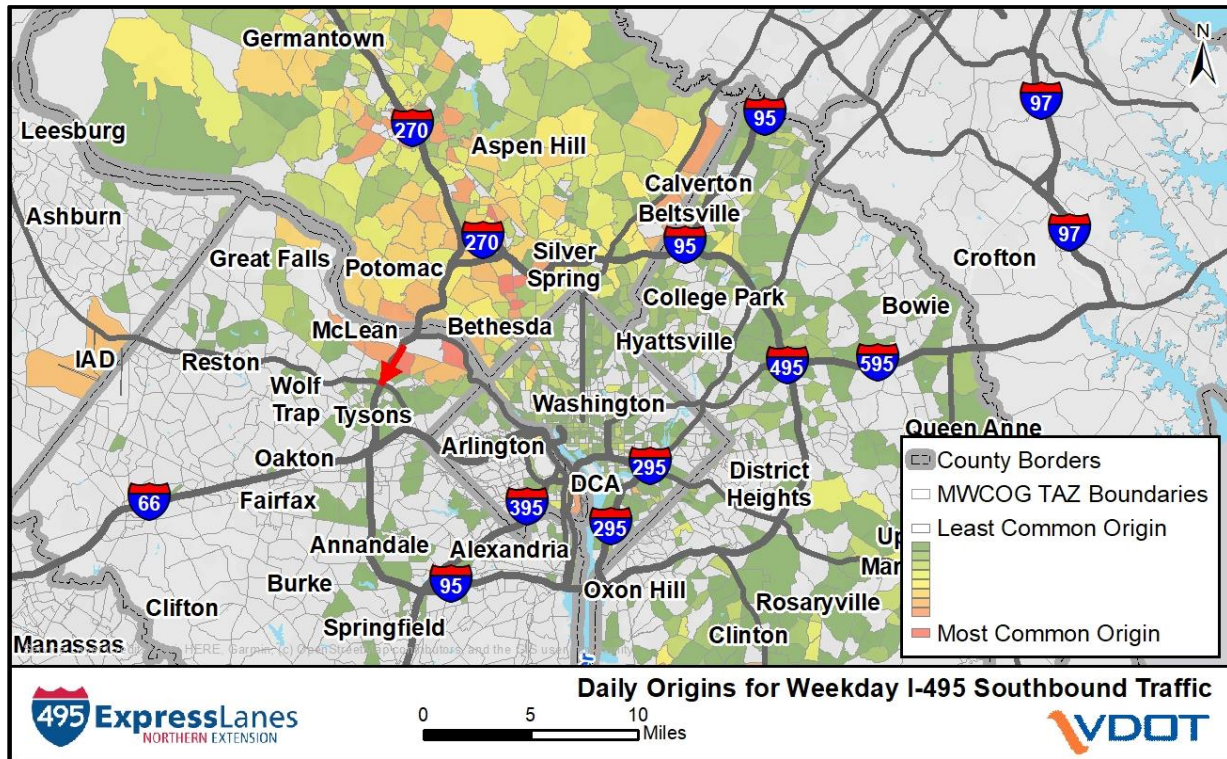


Figure 6-2. Daily Origins for Weekday I-495 Southbound Traffic

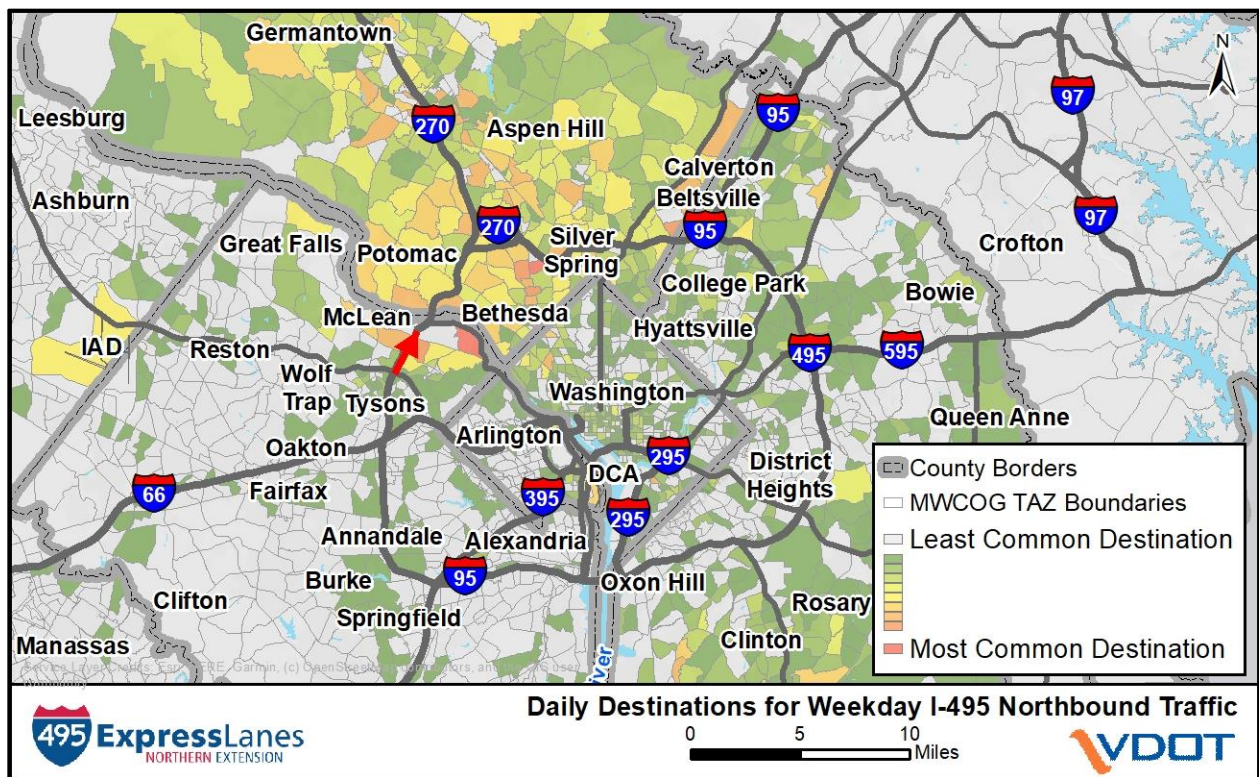


Figure 6-3. Daily Destinations for Weekday I-495 Northbound Traffic

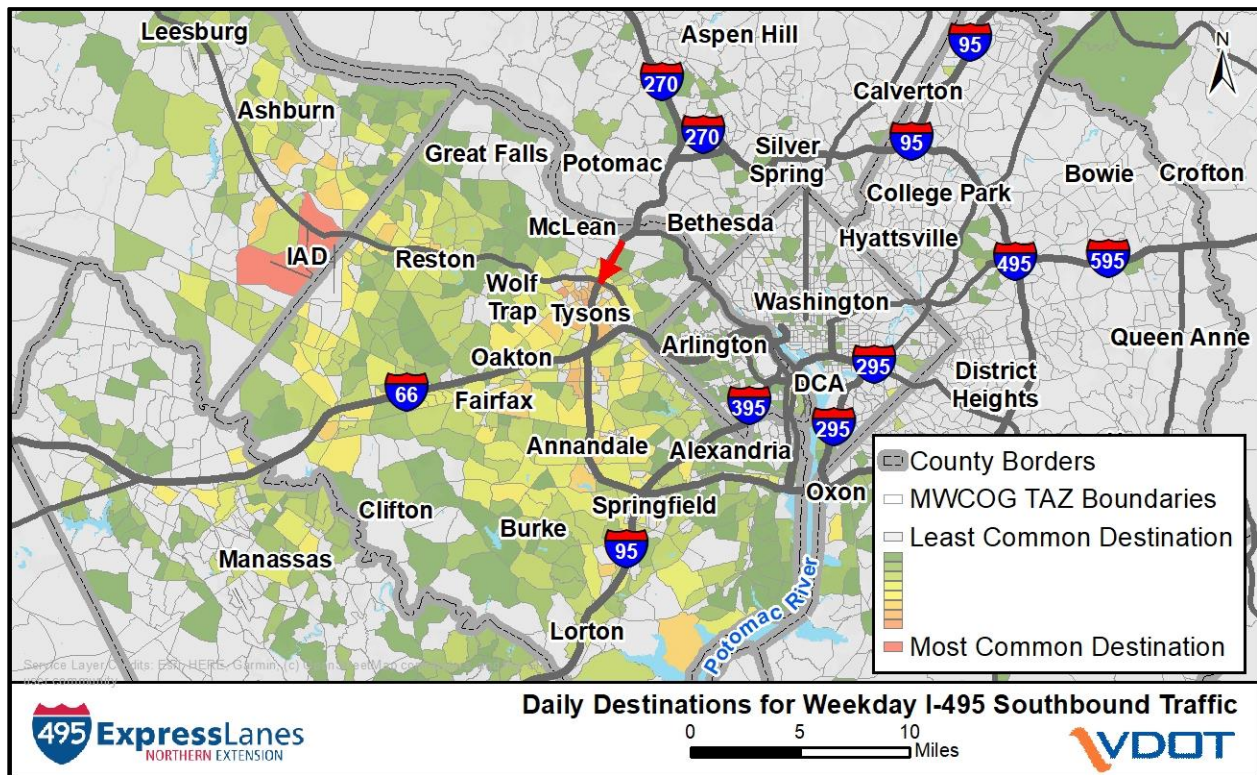


Figure 6-4. Daily Destinations for Weekday I-495 Southbound Traffic

### 6.3 ENVIRONMENTAL CONSEQUENCES

#### *No Build Alternative*

The No Build Alternative would not address congestion or provide improved regional access within or through the study area, resulting in continued productivity losses for workers and employers. While employment and population growth would still occur under the No Build Alternative, the existing congestion on I-495 could ultimately make Tysons and other commercial centers near the study area less attractive to potential employees, shoppers, and diners, which could potentially limit employment growth and retail revenue within these areas.

#### *Build Alternative*

The Build Alternative's reduced travel times and improved travel reliability would make employment opportunities near the study area more attractive to qualified workers in a larger geographic area who were previously deterred by long travel times. This would boost employment growth and productivity within the study area and the region as a whole. In addition, the extension of the managed lanes system could encourage carpooling in the area, allowing additional HOV users to take advantage of the Express Lanes for free. No adverse impact to employment or income is expected to occur under the Build Alternative.



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