3 PREFERRED ALTERNATIVE

The design elements of the Preferred Alternative were documented in the Supplemental DEIS **(SDEIS), Chapter 2**. Various elements have been updated or advanced and are described in this Final Environmental Impact Statement (FEIS).

Refer to **SDEIS, Chapter 2**: https://oplanesmd.com/wp-content/uploads/2021/09/SDEIS_02_Alternatives.pdf

This FEIS Chapter documents the following updates:

- Limits of work of the Preferred Alternative; **Section 3.1.1**
- Revisions to the Limits of Disturbance (LOD) for the Preferred Alternative; **Section 3.1.2**
- Preliminary design adjustments based on traffic operations and revisions proposed by the Developer; **Section 3.1.2**
- Modifications to the exchange ramp locations for high-occupancy toll (HOT) managed lane access; **Section 3.1.3**
- Transit considerations and connections with the Preferred Alternative; **Section 3.1.4**
- Pedestrian and bicycle facilities included with the Preferred Alternative; **Section 3.1.5**
- The on-site and off-site (compensatory) stormwater (SWM) management considerations; **Section 3.1.6**
- Review of existing culverts and potential culvert augmentation requirements; **Section 3.1.7**
- Continued constructability review of the Preferred Alternative; **Section 3.1.8**
- Maryland Transportation Authority (MDTA) Toll Rate Setting Process and Approval; **Section 3.1.9**
- Public-Private Partnership (P3) solicitation and Developer Agreement; **Section 3.3**

The Preferred Alternative: Alternative 9 – Phase 1 South improvements include two high-occupancy toll (HOT) managed lanes in each direction along I-495 and the conversion of the existing high-occupancy vehicle (HOV) lane to a HOT managed lane and one, new HOT managed lane in each direction on I-270 within the Phase 1 South limits. The limits of Phase 1 South are along I-495 from the George Washington Memorial Parkway in Virginia to west of MD 187 and along I-270 from I-495 to north of I-370 and on the I-270 east and west spurs as shown in **dark blue** in **Figure 3-1**. There is no action, or no improvements, included at this time on I-495 east of the I-270 east spur to MD 5 (shown in **light blue** in **Figure 3-1**).

The alternatives development process and identification of the Preferred Alternative is documented in the Final Environmental Impact Statement **(FEIS), Chapter 2**. This chapter presents the updates and advancements on the design elements of the Preferred Alternative, further considerations for transportation commitments and mitigation measures, and progress of the Phase 1 predevelopment process since publication of the SDEIS on October 1, 2021 (https://oplanesmd.com/sdeis/). A benefit of conducting a Public-Private Partnership (P3) process with predevelopment work concurrent with the National Environmental Policy Act (NEPA) process is to increase efficiency by receiving input from the

Developer on preliminary design and ancillary elements of the project. During the predevelopment work leading up to the FEIS, MDOT SHA and the Developer focused on refining the preliminary design concept and adjusting the limits of disturbance (LOD) to further avoid and minimize impacts to environmental resources, communities, properties, utilities, and other features. These design refinements and adjustments were done in consideration of comments received from the resource and regulatory agencies, public and other stakeholders. These results of this collaborative effort are reflected in this chapter and ensure that the design and associated LOD are appropriate and feasible ahead of final design.

Figure 3-1: I-495 & I-270 Managed Lanes Study Corridors – Preferred Alternative

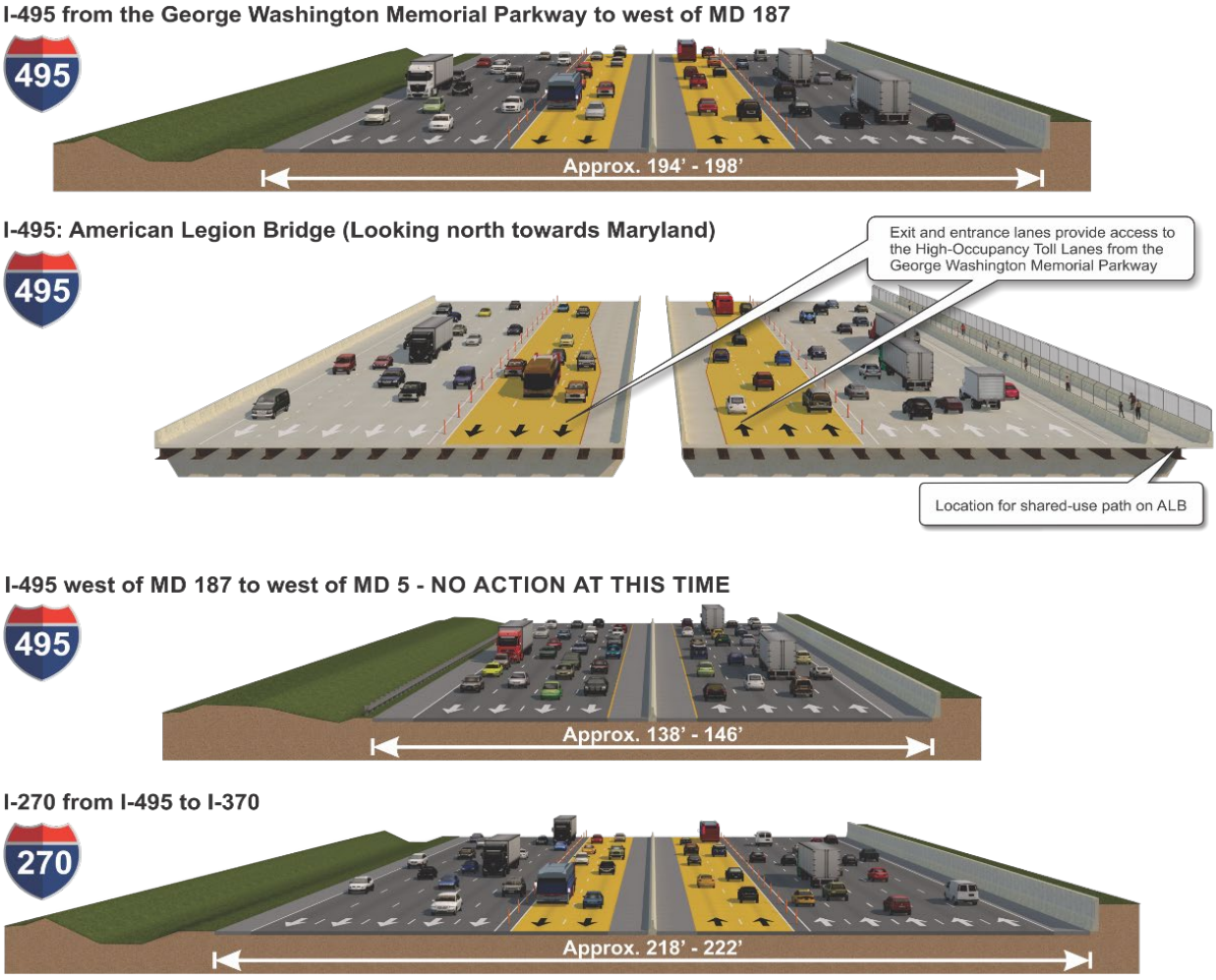
3.1 Elements of the Preferred Alternative

Updated design elements of the Preferred Alternative presented in this FEIS include details about the Alignment and Cost (**Section 3.1.1**); LOD (**Section 3.1.2**); Interchanges and HOT Managed Lanes Access (**Section 3.1.3**); Transit-Related Elements (**Section 3.1.4**); Pedestrian and Bicycle Facilities (**Section 3.1.5**); Stormwater Management (SWM) Considerations (**Section 3.1.6**); Cross Culverts (**Section 3.1.7**); Construction and Short-term Effects (**Section 3.1.8**); and Tolling (**Section 3.1.9**). These elements contributed to the refinement of the Preferred Alternative since the SDEIS and associated property and environmental impacts as presented in **FEIS, Chapter 5**. Specifically, modifications to the Preferred Alternative since the SDEIS included minor roadway design adjustments along the I-495 and I-270 mainlines and crossing roads, revisions to noise barrier locations based on further analysis, alterations to the SMW and culvert augmentation sites using the latest existing condition information, and continued application of avoidance and minimization efforts at sensitive resources. These targeted refinements were made in response to the public, stakeholder, and agency comments received on the DEIS and SDEIS related to concerns about resource and property impacts and in consideration of the Developer's proposed preliminary design concept.

3.1.1 Alignment and Cost

On I-495, the Preferred Alternative consists of adding two new, HOT managed lanes in each direction from the George Washington Memorial Parkway to west of MD 187. The extent of work along I-495 between the I-270 west and east spurs was refined since the SDEIS based on the Developer's proposed design concept and the physical improvements and the LOD have been limited to west of MD 187, as opposed to east of MD 187 as described in the SDEIS. As a result, potential property impacts along I-495 in the vicinity and east of the MD 187 interchange are avoided. On I-270, the Preferred Alternative consists of converting the one existing HOV lane in each direction to a HOT managed lane and adding one new HOT managed lane in each direction from I-495 to just north of I-370 and on the I-270 east and west spurs. The proposed typical sections for the Preferred Alternative along I-495 and I-270 are shown in **Figure 3-2**. The improvement limits along I-270 and the I-270 east and west spurs have not changed from those presented in the SDEIS. The HOT managed lanes would be separated from the general purpose lanes using flexible delineators placed within a buffer, as shown in **Figure 3-2**. Transit buses and HOV 3+ vehicles would be allowed free passage in the HOT managed lanes.

Figure 3-2: Alternative 9 - Phase 1 South Typical Sections (HOT Managed Lanes Shown in Yellow)



Along I-270, the existing collector-distributor (C-D) lane separation from Montrose Road to I-370 would be removed as part of the proposed improvements. MDOT SHA included this proposed lane reconfiguration and repurposing of pavement on I-270 for the Build Alternatives in the DEIS to address the current imbalanced traffic utilization along the C-D Road segment and in response to public comments to keep the improvements within the existing pavement footprint. As a result, the amount of roadway widening along I-270 needed for the Preferred Alternative is limited.

Virginia's 495 Express Lanes Northern Extension (495 NEXT) project would extend the existing Express Lanes on I-495 in Virginia by approximately three miles from the I-495 and Dulles Toll Road interchange to the vicinity of the American Legion Bridge (ALB). The Preferred Alternative will overlap and tie-in with the 495 NEXT improvements on I-495 at the George Washington Memorial Parkway interchange. MDOT has coordinated closely with the Virginia Department of Transportation (VDOT) to refine the preliminary design concept to consolidate and provide compatible movements at the interchange. Additionally, MDOT SHA's ongoing I-270 Innovative Congestion Management (ICM) project is providing a series of improvements to address mobility and safety at key points along I-270 targeted to reduce congestion at bottlenecks along the corridor in the short-term. Elements of the ICM that will be maintained within the Preferred Alternative limits include ramp metering; the additional auxiliary lane added in both directions along the I-270 west spur and I-270 mainline up to Montrose Road; and auxiliary lanes in both directions along I-270 between the MD 189 and MD 28 interchanges.

The preliminary estimated capital cost for the Preferred Alternative ranges between $3.75 and $4.25 billion. The methodology, assumptions, and components of the cost estimate have been refined since the SDEIS based on the level of information available and the preliminary design concept presented in the FEIS. This estimate includes costs for design, construction, property acquisition, and environmental mitigation. The cost estimate was prepared using major quantities in accordance with the MDOT SHA *Highway Construction Cost Estimating Manual* with additional construction elements quantified and appropriate contingencies added based on past construction experience and engineering judgment to reflect the increased level of detail available at this time. The cost estimate also includes costs for design and construction risks determined through a cost and schedule risk assessment (CSRA) workshop completed with FHWA in spring 2022. The cost range is in May 2022 dollars and escalations have not been applied.

Where available, quantities for earthwork; SWM facilities (including off-site SWM) and small drainage structures; bridges, retaining walls, noise barriers, and large drainage structures; new pavement and resurfacing; roadside barriers, sidewalks, and trails; landscaping; pavement markings, ITS equipment, signage, and lighting; tolling equipment; utility relocations; and environmental mitigation measures were obtained. The unit costs for these items account for labor, materials, and equipment and were determined based on recent bid prices and MDOT SHA standard costs. The added contingencies, applied as a markup or a percentage of certain cost categories, varied to account for items that could not be quantified at this level of detail and uncertainties in the accuracy of quantities estimated. Specific items that were added to the capital cost for the Preferred Alternative since the SDEIS included funding for various transit improvements and pedestrian safety initiatives as committed by the Developer (further described in **Section 3.2**). Additionally, costs for implementation of an Operations and Maintenance (O&M) Facility and Traffic and Tolling Operations Center (further described in **Section 3.1.2**) are included in the capital cost.

3.1.2 Limit of Disturbance

What changes were made to the Limit of Disturbance since the SDEIS?

Modifications to the LOD for the Preferred Alternative included:

- Continued application of avoidance and minimization efforts at sensitive resources;
- Design adjustments based on traffic operations and coordination with local stakeholders;
- Preliminary design revisions proposed by the Developer;
- Revisions to noise barrier locations based on further analysis; and
- Alterations to the stormwater management features and culvert augmentation sites through additional detailed evaluation.

The LOD was refined in targeted locations for the Preferred Alternative since the SDEIS. The LOD is the proposed boundary within which all mainline construction-related activities would occur. The LOD for the Preferred Alternative was determined from the proposed roadway typical section, interchange configuration, and roadside design elements and is shown on the *Environmental Resource Mapping* (**FEIS, Appendix E**). The mapping in **FEIS, Appendix E** includes a display of the proposed Preferred Alternative preliminary design concept based on continued coordination with the Developer. Property impacts associated with the LOD continued to be broken into permanent (or long-term) and temporary (or short-term) areas and are reported in **Chapter 5, Section 5.5.3**. Examples of temporary impacts include where a temporary construction easement would be acquired for the use of property for construction staging and/or storage that is not needed for the project after construction. The LOD for the Preferred Alternative assumed the potential area of disturbance for the following elements, with recent changes based on the Developer's preliminary design concept as noted:

- Profile adjustments and roadway shifts due to mainline widening, including isolated adjustments to the proposed design concept since the SDEIS based on traffic operations
- Crossroad shift to Persimmon Tree Road over I-495 based on Developer's preliminary design concept
- Inclusion of pedestrian and bicycle facilities for roads that cross over I-495 and I-270 with refinements based on continued coordination with Montgomery County and the City of Rockville since the SDEIS (refer to **Section 3.1.5**)
- Direct access ramps and exchange ramps for access to the HOT managed lanes, including specific adjustments to the exchange ramp locations based on the Developer's preliminary design concept (refer to **Section 3.1.3**)
- Interchange ramp relocation, reconfiguration, and tie-ins due to mainline widening
- Intersection modifications to improve safety and operations at Wootton Parkway at Seven Locks Road and Gude Drive at Research Boulevard (see **Chapter 4, Section 4.4.1**)
- Placement of toll gantries and ITS equipment, refined based on the Developer's preliminary concept
- On-site drainage and SWM, refined based on the Developer's preliminary concept and existing condition information, including swales, ponds, and large facilities along the roadside and within interchanges
- Relocation of existing streams, where determined to be feasible
- Culvert extensions, auxiliary pipes, and drainage outfall stabilization areas to accommodate roadway drainage, refined based on the Developer's preliminary concept

- Noise barrier extension/replacement/construction, refined based on further analysis since the SDEIS
- Reconstruction of I-495 and I-270 mainline and interchange ramp bridges over water and roadways
- Full replacement and widening of the ALB
- Utility relocations
- Avoidance and impact minimization of adjacent land uses such as: streams, wetlands, historic properties, parks, and private properties; including refinements resulting from comments received on the SDEIS and application of avoidance and minimization techniques to the Developer's preliminary design concept (**Chapter 5**)
- Construction access, staging, materials storage, grading, clearing, and erosion and sediment control, including targeted adjustments to these locations based on input from the Developer

For the compensatory or off-site SWM sites, an LOD for each potential site was developed. The number of potential sites has changed since the SDEIS. Refer to **Section 3.1.6 C** and **FEIS, Appendix D** for details.

Since the SDEIS, MDOT SHA identified and evaluated potential locations for an O&M Facility and a Traffic and Tolling Operations Center. The O&M Facility will consist of office trailers and maintenance equipment such as trucks, trailers, and equipment for performing highway maintenance. The O&M Facility is proposed to be located at the existing MDOT SHA Gaithersburg Shop at 502 Quince Orchard Road, just west of I-270 (refer to **Figure 3-3**). There will be no environmental or property impacts associated with implementation of the O&M Facility as the facility will be placed within the existing paved footprint within property owned by MDOT SHA. The Traffic and Tolling Operations Center will house staff, computers, phones, and back office systems for operating the HOT managed lanes and will be located in an existing facility or existing building near the study corridors. There will be no environmental or property impacts associated with implementation of the Traffic and Operations Center.

Figure 3-3: Operations & Maintenance Facility Location Map

3.1.3 Interchanges and HOT Managed Lanes Access

Have the Managed Lanes access points changed since the SDEIS?

- Exchange ramps between Virginia and Maryland have been consolidated at I-495 in the vicinity of the George Washington Memorial Parkway; and
- At-grade exchange ramps for ingress and egress between the HOT managed lanes and general purpose lanes are proposed in both directions along the I-270 west spur.

The HOT managed lane access locations within the Phase 1 South limits, except for the exchange ramps, did not change from those identified in the SDEIS for the Preferred Alternative, **Table 3-1**. In the SDEIS, exchange ramps between Virginia and Maryland were proposed along I-495 at the interface with the Virginia 495 Express Lanes south of the ALB (egress from the Maryland HOT managed lanes to the general purpose lanes along the outer loop only) and north of the Clara Barton Parkway (ingress to the Maryland HOT managed lanes from the general purpose lanes along the inner loop only). Since the SDEIS, the design concept has been modified to consolidate and provide these movements along I-495 in Virginia south of the ALB, in the vicinity of the interchange at the George Washington Memorial Parkway. Additionally, a pair of exchange ramps has been added as proposed by the Developer along the I-270 west spur north of I-495. These at-grade exchange ramps allow for ingress and egress between the HOT managed lanes and general purpose lanes in both directions along I-270 and would look like the configuration shown in **Figure 3-4**. The locations of these exchange ramps are shown in **FEIS, Appendix E**.

Figure 3-4: Example At-Grade Exchange Ramp Configuration

There are 34 existing interchanges within the study limits, and 14 existing interchanges within the limits of Phase 1 South of the Preferred Alternative. All 14 interchanges would be modified as needed to accommodate the mainline widening of I-495 and I-270. The HOT managed lanes traveling in the same direction as the general purpose lanes would be separated from the general purpose lanes by a buffer

and flexible delineators as shown in the typical sections (**Figure 3-2**). Access to and from the HOT managed lanes would be provided via direct access ramps at select existing interchanges; direct access ramps at two new interchanges; exchange ramps between Virginia and Maryland where ingress to the Maryland HOT managed lanes from the general purpose lanes along the inner loop and egress from the Maryland HOT managed lanes to the general purpose lanes along the outer loop would be provided; exchange ramps providing ingress to and egress from the HOT managed lanes in both directions along the I-270 West Spur; and at the limits of the build improvements for the Preferred Alternative. An example of the configuration for the direct access interchange ramps is shown in **Figure 3-5**.

Figure 3-5: Example Direct Access Interchange

The preliminary direct access locations were identified using the following considerations and have not changed since the SDEIS:

- Providing system-to-system connections between major interstates and freeways (e.g., I-495/I-270 west spur, I-270/I-370)
- Providing access at interchanges with high traffic demand (e.g., MD 190)
- Providing access throughout the study area (e.g., Gude Drive, Wootton Parkway)
- Providing access in consideration of land use and at major transit facilities (e.g., Westlake Terrace at Westfield Montgomery Mall Transit Center)
- Potential community, property, and environmental impacts resulting from providing access.

In total, access to and from the HOT managed lanes is proposed at nine locations (five existing interchanges, two new interchanges, and two exchange ramp locations), as well as at the termini of the HOT managed lanes along I-495 west of MD 187, along the I-270 east spur south of MD 187, and along I-270 north of I-370. The interchanges that will be modified as part of the Preferred Alternative to

accommodate the widened mainline and HOT managed lane access locations are listed in **Table 3-1** and shown in **Figure 3-6** and **FEIS, Appendix E**. **Table 3-1** also includes a list of the I-495 interchange locations within the study limits and outside of Phase 1 South limits that will not be improved for the Preferred Alternative. The blue shaded rows indicate the HOT managed lanes access locations.

The proposed configuration of the I-495 interchange at MD 190 (River Road) was modified since the SDEIS based on the Developer's preliminary design concept. In the SDEIS, direct access to and from the HOT managed lanes and MD 190 was provided via separate flyover ramps. The concept incorporated in the Preferred Alternative and this FEIS includes a set of ramps to and from the HOT managed lanes that connect to MD 190 at a new four-leg intersection, similar to the ramps shown in **Figure 3-5**. The proposed interchange improvements are shown in **FEIS, Appendix E.**

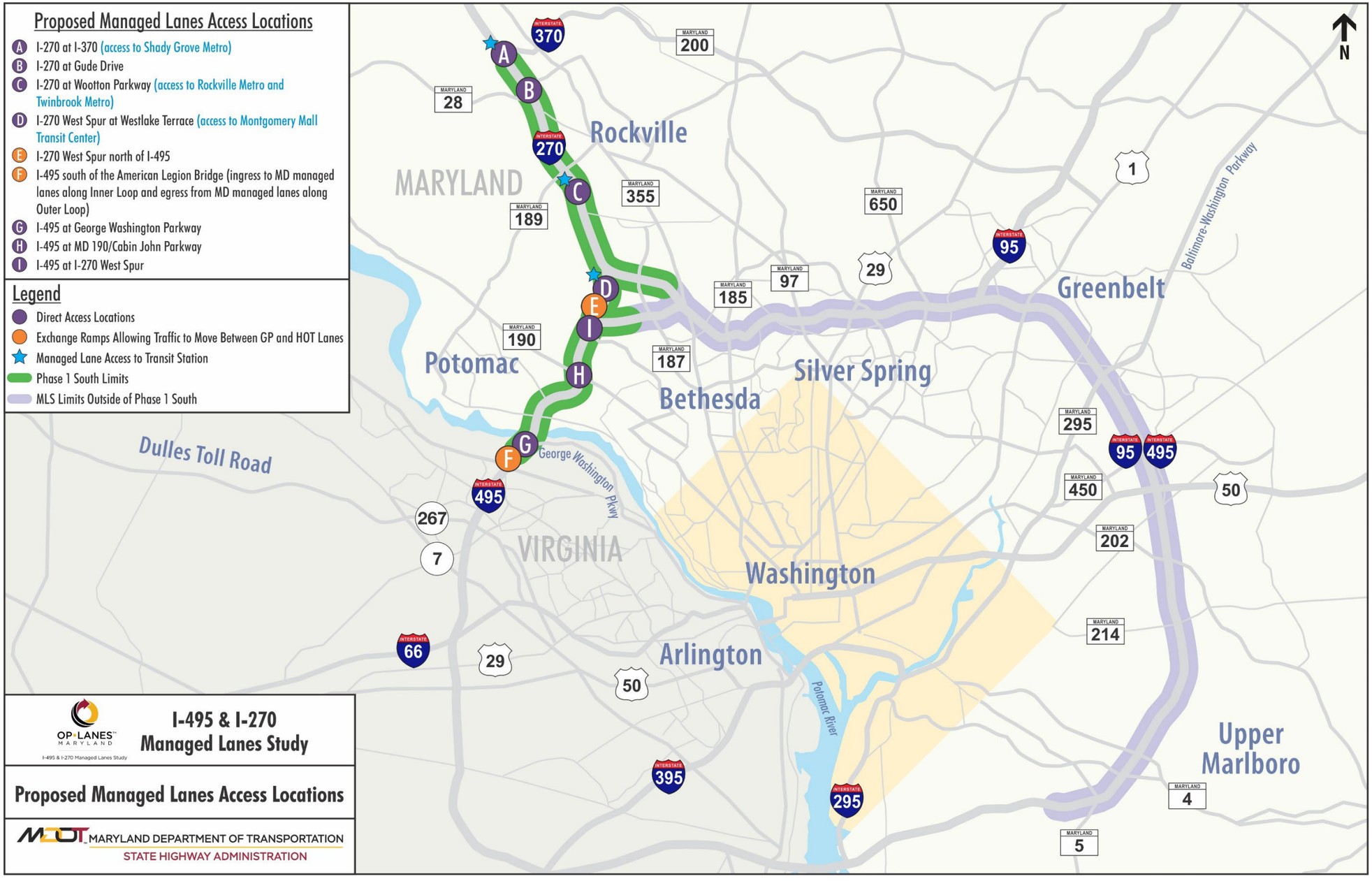
Table 3-1: Interchange Improvements/HOT Managed Lane Access Locations under Preferred Alternative

Location	Modification
Interface with Virginia I-495 HOT Lanes south of the ALB (see location 'F' on **Figure 3-5**)	• Exchange ramp from Maryland HOT managed lanes to Virginia general purpose lanes (outer loop only) • Exchange ramp from the Virginia general purpose lanes to Maryland HOT managed lanes (inner loop only)
I-495/George Washington Memorial Parkway Interchange (see location 'G' on **Figure 3-5**)	• Direct access to HOT managed lanes in Maryland • Adjusted interchange ramps to accommodate widened mainline
I-495/Clara Barton Parkway Interchange	• Adjusted interchange ramps to accommodate widened mainline
I-495/MD 190/Cabin John Parkway Interchange (see location 'H' on **Figure 3-5**)	• HOT managed lanes direct access interchange • Adjusted interchange ramps to accommodate widened mainline
I-495/I-270 west spur Interchange (see location 'I' on **Figure 3-5**)	• HOT managed lanes direct access interchange • Reconstructed interchange to accommodate HOT managed lanes
I-495/MD 187 Interchange	• No proposed interchange improvements
I-495/I-270 east spur/MD 355 Interchange	• No proposed interchange improvements
I-495/MD 185 Interchange	• No proposed interchange improvements
I-495/MD 97 Interchange	• No proposed interchange improvements
I-495/US 29 Interchange	• No proposed interchange improvements
I-495/MD 193 Interchange	• No proposed interchange improvements
I-495/MD 650 Interchange	• No proposed interchange improvements
I-495/ I-95 Interchange	• No proposed interchange improvements
I-495/US 1 Interchange	• No proposed interchange improvements
I-495/Greenbelt Metro Interchange	• No proposed interchange improvements
I-495/MD 201 Interchange	• No proposed interchange improvements
I-495/Baltimore-Washington Parkway Interchange	• No proposed interchange improvements
I-495/MD 450 Interchange	• No proposed interchange improvements
I-495/US 50 Interchange	• No proposed interchange improvements
I-495/MD 202 Interchange	• No proposed interchange improvements
I-495/Arena Drive Interchange	• No proposed interchange improvements
I-495/MD 214 Interchange	• No proposed interchange improvements
I-495/Ritchie Marlboro Interchange	• No proposed interchange improvements

Location	Modification
I-495/MD 4 Interchange	• No proposed interchange improvements
I-495/MD 337/Suitland Road Interchange	• No proposed interchange improvements
I-495/MD 5 Interchange	• No proposed interchange improvements
I-270 west spur north of I-495 (see location 'E' on **Figure 3-5**)	• Exchange ramps allowing ingress to and egress from the HOT managed lanes to general purpose lanes
I-270 west spur/Democracy Boulevard Interchange	• Adjusted interchange ramps to accommodate widened mainline
I-270 west spur/Westlake Terrace Interchange (see location 'D' on **Figure 3-5**)	• Repurposed existing HOV only ramps to/from north to HOT managed lanes direct access ramps • Added HOT managed lanes direct access ramps to/from south
I-270 Y-Split Interchange	• Reconstructed interchange to accommodate HOT managed lanes
I-270/Montrose Road Interchange	• Adjusted interchange ramps to accommodate widened mainline
I-270/Wootton Parkway Interchange *(new interchange)* (see location 'C' on **Figure 3-5**)	• New interchange for HOT managed lanes direct access only
I-270/MD 189 Interchange	• Reconfigured interchange ramps to accommodate widened mainline
I-270/MD 28 Interchange	• Adjusted interchange ramps to accommodate widened mainline
I-270/Gude Drive Interchange *(new interchange)* (see location 'B' on **Figure 3-5**)	• New interchange for HOT managed lanes direct access only
I-270/Shady Grove Road Interchange	• Adjusted interchange ramps to accommodate widened mainline
I-270/I-370 Interchange (see location 'A' on **Figure 3-5**)	• HOT managed lanes direct access interchange (to/from south only) • Adjusted ramps to accommodate widened mainline
I-270 east spur/MD 187/Rockledge Drive Interchange	• Adjusted interchange ramps to accommodate widened mainline

Note: The rows shaded in blue indicate HOT managed lanes access locations.

Figure 3-6: Proposed Preferred Alternative HOT Managed Lanes Access Locations



3.1.4 Transit-Related Elements

To support the Study's purpose of enhancing existing and planned multimodal mobility and connectivity, the Preferred Alternative includes transit-related elements that provide access/connectivity and enhance mobility for transit vehicles and passengers. Additionally, MDOT SHA's I-495 & I-270 P3 Office has prepared the Transit Service Coordination Report as the initial product from the I-495 & I-270 Managed Lanes Transit Work Group to assist affected counties and transit providers in prioritizing capital and operating investments.

Transit Riders Will Benefit from the HOT Managed Lanes

- Enhances transit mobility and connectivity to existing and planned transit facilities.
- Provides less-congested and more reliable routes for bus service.
- Provides opportunities for planned or modified bus service to connect to underserved suburban to suburban transit markets.
- Provides opportunities for new express bus service in National Capital Region, such as between Bethesda and Tysons.

An update regarding the transit-related elements and connections for the Preferred Alternative was included in the **SDEIS, Chapter 2** and is repeated here. A joint study by the MDOT Maryland Transit Administration and the Virginia Department of Rail and Public Transportation (DRPT) has identified opportunities for transit enhancements related to multimodal connectivity across the ALB. The conclusions of the study report are repeated in **Section 3.1.4 B,** below.

A. Enhanced Transit Mobility and Connectivity

MDOT SHA has identified opportunities to enhance transit mobility and connectivity within the Preferred Alternative to address the Purpose and Need and public and agency comments received. These include the following elements, which have not changed since the SDEIS:

- Free bus transit usage of the HOT managed lanes to provide an increase in speed of travel, assurance of a reliable trip, and connection to local bus service/systems on arterials that directly connect to activity and economic centers.
- Access from the proposed HOT managed lanes to existing transit stations and planned Transit Oriented Development via direct and indirect connections as shown in **Figure 3-6**. A direct connection is where the HOT managed lanes ramps connect to an arterial at or near the location of a transit facility like at the Westfield Montgomery Mall Transit Center on Westlake Terrace. A connection is considered indirect where the transit facility is not adjacent to, but in relatively close proximity to the HOT managed lanes access point, like at the Shady Grove Metro Station on I-370, and the Twinbrook and Rockville Metro Stations near Wootton Parkway. New or existing bus routes can take advantage of the relative proximity to the HOT managed lanes for express bus service or other direct connections.

MDOT SHA and the Developer have committed to additional regional transit improvements and investments in transit services and projects that are outside of the Preferred Alternative mainline improvements as part of the P3 Agreement. While these commitments are not required as part of the project to address the Study's Purpose and Need, they will enhance existing and planned transit and support new opportunities for regional transit service and are described in **Section 3.2.1**.

B. I-495/American Legion Bridge Transit and Transportation Demand Management Plan

The *I-495/ALB Transit/Transportation Demand Management (TDM) Study*, a joint effort between the MDOT Maryland Transit Administration and the Virginia Department of Rail and Public Transportation (DRPT), was initiated to identify a range of current and future potential multimodal solutions that could be implemented to reduce congestion, improve trip reliability and regional connections, and enhance existing and planned multimodal mobility and connectivity for travel between Maryland and Virginia across the ALB.

A series of potential investment packages to provide new mobility choices to service bi-state travel was identified in the *I-495/ALB Transit/TDM Final Report and Plan.*[1] Each package outlined a combination of transit service elements, technology enhancements, Commuter Assistance Programs, and parking needs. The suggested next steps recommended in the Final Report included advancement of transit service before or during construction of the HOT managed lanes, consideration of a bus-on-shoulder approach based on the sequence and duration of construction of the HOT managed lanes, working with local entities and transit providers to facilitate first-last mile connections, and determining local service modifications. Additional next steps were related to commuter assistance programs and technology enhancements, and parking and facility needs. These potential investment packages and regional transit improvements by MDOT, the VDOT, and the DRPT will continue to be developed and considered by both states.

The ALB shall be designed and constructed such that a future capital improvement project will have one or more feasible options to achieve the full design and implementation of a transit line across the ALB. These options will be enabled by designing the northbound and southbound structures to not preclude a possible future transit line including the addition of foundation and substructure elements.

3.1.5 Pedestrian and Bicycle Facilities

The Preferred Alternative reflects a commitment to provide pedestrian and bicycle connectivity and mobility in the study area in response to comments received throughout the NEPA process. A determination of existing pedestrian and bicycle facilities that would need to be replaced as part of the Preferred Alternative was considered in the **SDEIS, Chapter 2**. The updates since the SDEIS consist of refinement of the design criteria based on the Montgomery County *Complete Streets Design Guide* (February 2021) in consultation with Montgomery County through multiple meetings and further coordination with the City of Rockville.

As stated in the SDEIS, existing pedestrian and bicycle facilities impacted by the Preferred Alternative would be replaced in kind or upgraded to meet the current master plan recommended facilities. Provision of these upgraded facilities would be subject to maintenance agreements between MDOT SHA and the local jurisdictions in compliance with Maryland law.

The design approach for facilities along crossroads where the crossroad bridge would be reconstructed is to replace, upgrade, or provide new pedestrian/bicycle facilities consistent with the current master plan, where adjacent connections on either side of the bridge currently exist. Where the I-495 and I-270 mainline or ramps cross over a roadway or pedestrian/bicycle facility and the bridge would be replaced, the mainline and ramp bridges would be lengthened to accommodate the footprint for the master plan

[1] http://www.drpt.virginia.gov/media/3375/i495_alb_transittdm_study_finalreport_030521_combined.pdf

facility under the structure. The two locations where lengthening of the mainline bridges is included in the Preferred Alternative are described below:

- Lengthen the I-495 bridge over Seven Locks Road to accommodate pedestrian/bicycle facilities along Seven Locks Road. MDOT has committed to constructing the master plan recommended facilities along Seven Locks Road (refer to **Section 3.2.2**).
- Lengthen the I-270 bridge over Tuckerman Lane to accommodate future pedestrian/bicycle facilities along Tuckerman Lane. Montgomery County would construct the master plan recommended facilities along Tuckerman Lane in the future.

These efforts respond directly to comments received from local agencies and stakeholders and support the Study's Purpose of enhancing multimodal mobility and connectivity by removing barriers to non-vehicular mobility.

The proposed pedestrian and bicycle facilities that would be constructed as part of the Preferred Alternative are listed in **Table 3-2** and shown in **FEIS, Appendix E**. Refer to **Section 3.2.2** for a list of pedestrian and bicycle facility commitments that are part of the Preferred Alternative and are additional improvements beyond this base design approach, including the shared use trail across the ALB.

Identification of the proposed pedestrian and bicycle facilities was conducted during the NEPA process in coordination with the Maryland-National Capital Park and Planning Commission (M-NCPPC), the Montgomery County Department of Transportation (MCDOT), and the City of Rockville. Coordination with these key agency stakeholders will continue through final design. The new facilities or upgrades included in the Preferred Alternative were designed at a planning level in accordance with MDOT SHA, Montgomery County, or City of Rockville design requirements, including consideration of the recent Montgomery County *Complete Streets Design Guide*.

3.1.6 Stormwater Management Considerations

As presented in the **SDEIS, Chapter 2**, a planning-level, conceptual identification of SWM needs was considered throughout the Phase 1 South limits when establishing the LOD for the Preferred Alternative. The Maryland *Stormwater Management Act of 2007* emphasizes environmental site design (ESD)[2] and consideration of SWM early in the planning stage of a project to better balance transportation needs, right-of-way considerations, and requirements of the Act, which include both water quality (i.e., ESD) and water quantity management. Water quality management treats the first flush of rainfall to remove pollutants and improve downstream conditions. Water quantity management stores and slowly releases water to reduce downstream flooding.

[2] Title 4, Subtitle 201.1(B) of the Stormwater Management Act of 2007 defines ESD as "...using small-scale stormwater management practices, nonstructural techniques, and better site planning to mimic natural hydrologic runoff characteristics and minimize the impact of land development on water resources." Under this definition, ESD includes optimizing conservation of natural features (e.g., drainage patterns, soil, vegetation); minimizing impervious surfaces (e.g., pavement, concrete channels, roofs); slowing down runoff to maintain discharge timing and to increase infiltration and evapotranspiration; or using other nonstructural practices or innovative technologies approved by the Maryland Department of Environment (MDE).

Modifications to the SWM approach for the FEIS included reevaluation of stormwater needs and locations based on a more detailed volume-based analysis and the development of a SWM concept to fit within the Preferred Alternative LOD developed for the SDEIS and refined for the FEIS. The methodology for the previous stormwater evaluation for LOD development is presented in the **DEIS, Chapter 2** and **SDEIS, Chapter 2**.

Table 3-2: Pedestrian and Bicycle Facilities in the Preferred Alternative

Location	Proposed Improvement
Persimmon Tree Road over I-495	• Construct a new sidepath on the west side of Persimmon Tree Road • Construct a new sidewalk on the east side of Persimmon Tree Road
MD 190 (River Road) over I-495	• Construct new bike lanes in both directions on MD 190 • Construct new sidepaths on both sides of MD 190
MD 191 (Bradley Boulevard) over I-495	• Construct new bike lanes in both directions on MD 191 • Construct a new sidewalk on the south side of MD 191 • Construct a new sidepath on the north side of MD 191
Democracy Boulevard over I-270 west spur	• Reconstruct the existing sidewalk on the south side of Democracy Boulevard • Reconstruct the existing sidepath on the north side of Democracy Boulevard
Westlake Terrace over I-270 west spur	• Construct new two-way separated bike lanes and reconstruct the existing sidewalk on the south side of Westlake Terrace • Reconstruct the existing sidewalk on the north side of Westlake Terrace
Montrose Road over I-270	• Construct a new Breezeway[3] on the south side of Montrose Road • Reconstruct the existing sidewalk on the north side of Montrose Road
Wootton Parkway over I-270	• Reconstruct the existing sidewalk on the south side of Wootton Parkway • Reconstruct the existing shared use path on the north side of Wootton Parkway
MD 189 (Falls Road) over I-270	• Construct new bike lanes in both directions of MD 189 • Construct new sidewalks on both sides of MD 189
MD 28 (W. Montgomery Avenue) over I-270	• Construct new bike lanes/bikeable shoulders in both directions of MD 28 • Reconstruct the existing shared use path on the south side of MD 28 • Construct a new sidewalk on the north side of MD 28
Gude Drive over I-270	• Construct new bike lanes in both directions of Gude Drive • Reconstruct the existing shared use path (Millennium Trail) on the south side of Gude Drive • Construct a new sidewalk on the north side of Gude Drive
Shady Grove Road over I-270	• Construct a new Breezeway[3] on the south side of Shady Grove Road • Construct a new sidepath on the north side of Shady Grove Road

Note: In the SDEIS, the proposed sidepaths on MD 190 (River Road) were a separate transportation commitment; however, are now part of the Preferred Alternative design approach that is consistent with the current master plan.

[3] Breezeways are envisioned to carry a high percentage of through traffic and can include trails, sidepaths, and separated bike lanes.

The land adjacent to the study corridors is heavily developed with numerous natural, cultural, and socioeconomic resources. The existing roadways are a mix of open section (i.e., no curb or concrete barrier) and closed section (i.e., curb or retaining wall) with superelevated cross slopes through horizontal curves. The density of development adjacent to the study corridors, combined with numerous environmental sensitive areas, complicated the efforts of finding enough suitable SWM on-site storage and treatment locations. However, as the design continues to progress, MDOT SHA will ensure SWM water quality requirements and treatment will be provided to the maximum extent practicable (MEP) at on-site locations, as required under the Maryland SWM Act.

A. Methodology and Assumptions

The Preferred Alternative will be required to meet all SWM permitting requirements for Maryland and Virginia, which includes both water quality treatment and water quantity control. Most of the project is located in Maryland and therefore the following sections will focus on the Maryland regulations.

In Maryland, water quality treatment must be provided onsite to the MEP for all new impervious area and a minimum of 50 percent of reconstructed existing impervious area to mimic the runoff characteristics of woods in good conditions. Reconstructed impervious area is defined as existing pavement that is removed, disturbing bare earth, before being repaved or repurposed. Maryland also requires that proposed stormwater runoff for this project be reduced to match existing runoff for the 10-year storm. Variances can be granted for minimal increases in stormwater runoff, but detailed calculations must be provided to show that the increased runoff will not result in downstream flooding or erosion. In addition, local jurisdictional concurrence for any runoff increases will be required. In locations where there is documented downstream flooding, control of the 100-year storm may also be required.

The 2017 National Climate Assessment indicates that future rainfall events will increase in both frequency and intensity, leading to more urban and riverine flooding unless steps are taken to mitigate the impacts. In order to increase resiliency and mitigate increased stormwater runoff, the State of Maryland is updating the stormwater quantity management standards for flood control. At this time, the new requirements have not been established but may include increasing precipitation amounts to account for future climate change and/or requiring management of larger storm events. Depending on when these new quantity management standards are adopted in Maryland, this project may be required to meet the updated standards for climate change stormwater resilience.

A stormwater concept was developed by the Developer for the Preferred Alternative using standard Maryland Department of the Environment (MDE) approved hydrology and hydraulic procedures, which includes a volumetric approach for calculating stormwater credit. A total of 167 Points of Investigation (POI) or Lines of Investigation (LOI), defined as locations where project-related stormwater runoff leaves the MDOT SHA right-of-way, were identified for Phase 1 South. Required and provided stormwater needs were then tabulated for each POI/LOI.

Existing stormwater runoff was calculated at each POI/LOI using existing land use and standard MDE approved methodology. Proposed stormwater runoff was calculated at each POI/LOI using proposed land use based on preliminary roadway engineering and MDE methodology. Stormwater runoff or discharge was calculated for the 1-year and 10-year storms. Management of the 100-year storm, which may be a

requirement if there are documented downstream flooding problems, will be coordinated with Montgomery County during final design.

Required water quality treatment was calculated using the guidelines for state and federal projects for water quality shading and an evaluation of water quality loss based on preliminary roadway design. Existing stormwater best management practices (BMPs) were identified using the MDOT SHA National Pollutant Discharge Elimination System (NPDES) database. If an existing BMP was impacted by the proposed work, then the loss of water quality was added to the water quality requirements.

For this analysis, the reconstructed impervious area was quantified by assuming all outside shoulders, bridge decks, and approaches to bridge decks that need profile adjustments would be reconstructed. In addition, inside shoulders were assumed to be reconstructed when being converted or partially converted to a travel lane.

The total impervious area requiring treatment (IART) was determined for the Preferred Alternative and is presented in **Table 3-3** below. A total of approximately 116 acres of new impervious area is anticipated for Phase 1 South. All the new impervious area will need to be treated for both water quality and water quantity. In addition, approximately 72 acres of existing impervious area will require water quality treatment and approximately 22 acres of existing water quality treatment is expected to be impacted by the project and must be replaced.

Table 3-3: Stormwater Management Requirements for the Preferred Alternative

IART from Loss of Water Quality (ac)	IART from Redevelopment (ac)	IART from New Development (ac)	Total IART (ac)
21.75	72.03	116.20	209.98

Note: Stormwater requirements are for work in Maryland only.

The Preferred Alternative will also include work in Virginia, located between the George Washington Memorial Parkway and the southern bank of the Potomac River. Coordination with VDOT on the 495 NEXT project is ongoing and will continue through final design. The Virginia Department of Environmental Quality (VDEQ) requires the two-year storm be managed for erosion control and requires the ten-year storm be managed to match existing conditions if there are documented downstream flooding concerns. For water quality treatment, VDEQ requires that nutrient loading based on land cover be calculated and that a minimum of 75 percent of the difference between existing and proposed nutrient loads be treated on-site. The remaining 25 percent can be purchased from a Nutrient Credit Bank. A preliminary SWM evaluation was completed for the Virginia section of the Preferred Alternative. Since the 495 NEXT project will be constructed first, the proposed conditions for the 495 NEXT project were used as the existing land cover for the Preferred Alternative. The SWM evaluation resulted in a required reduction of approximately 20 pounds of phosphorus to meet water quality requirements.

B. On-site Stormwater Management Provided for the Preferred Alternative

On-site SWM was evaluated on a POI basis for both water quality and water quantity in Maryland. SWM locations were refined between the SDEIS and FEIS based on agency coordination and more detailed preliminary design efforts, which included an evaluation of proposed grading to maximize the provided SWM facility footprints within the LOD. In addition, more stormwater treatment was realized through the

use of innovative design to reduce facility footprints and SWM facilities that could provide both water quantity and quality treatment within the same footprint. Proposed SWM facilities for the FEIS include wet ponds, extended detention ponds, underground quantity facilities, submerged gravel wetlands, grass swales, bioswales, micro-bioretentions, bioretentions, underground sand filters, etc. The proposed, large surface SWM features are shown on the *Environmental Resource Mapping* (**FEIS, Appendix E**).

Proposed water quantity facilities to control the ten-year storm were evaluated first since quantity requirements must be met on-site at each POI, whereas water quality treatment must be maximized onsite but can be provided off-site, if needed. Based on the preliminary stormwater concept completed, 153 of the 167 POIs would meet the water quantity requirements. Fourteen POIs would not meet the water quantity requirements and may require either a variance or waiver approval. Variance requests may be needed for 11 out of these 14 POIs. Variance requests are very common for roadway projects and are typically related to minimal increases in downstream discharges or where adherence to a particular regulation may have adverse impacts. As more detailed design advances, MDOT SHA and the Developer will work toward meeting the water quantity requirements at these POIs or justifying the use of a variance. Variance approval would occur at final design and would require both local jurisdictional approval and documentation that no adverse impact would occur.

Three out of the 167 POIs will qualify for a quantity waiver due to direct discharge to the Potomac River. In Maryland, direct discharge to a major water body qualifies for a waiver from quantity management because the runoff from a bridge will enter the major waterway significantly before the peak in the waterway elevation and therefore will not affect downstream flooding. Meeting quantity requirements on the shorelines adjacent to the ALB is challenging because the National Park Service (NPS) has jurisdiction over the land on both sides of the river and does not allow SWM on their property unless the facilities are part of the management of NPS parkland. Additionally, the water must be drained from the bridge deck quickly to prevent the safety concerns of vehicles hydroplaning and icing on the roadway and pipe systems. Consequently, the deck runoff will drain through bridge scuppers to the river via downspouts at bridge piers.

Water quality facilities to provide the required IART identified in **Table 3-3** to the MEP were also evaluated. ESD facilities[4] were considered first. At POIs where the total required water quality treatment could not be met using ESD facilities, structural facilities[5] and underground facilities were proposed to provide additional water quality treatment onsite. Once onsite water quality has been provided to the MEP, off-site SWM locations within the same 6-digit watershed can be used to provide the remaining water quality requirement. Off-site SWM facilities, including an explanation of the prioritization/hierarchy for the off-site selection, are discussed in the Compensatory SWM Mitigation Plan (**Section 3.1.6 C**) and the full report is available in **FEIS, Appendix D**.

Due to the large amount of required IART for the Preferred Alternative and existing site constraints, the water quality need could not be fully met onsite for the Preferred Alternative. **Table 3-4** shows the

[4] Environmental Site Design (ESD) facilities, also known as Chapter 5 facilities, are small-scale treatment practices including alternative surfaces, non-structural practices, and micro-scale practices (swales, micro-bioretention facilities).
[5] A Chapter 3 facility is defined as a structural facility and includes all facilities listed in Chapter 3 of the 2000 Maryland Stormwater Design Manual. Structural facilities tend to have larger footprints and treat more impervious area per facility. They also can provide both water quality and quantity treatment. Examples include wet ponds, sand filters, infiltration trenches.

estimated impervious area treated (IAT) onsite for the Preferred Alternative and the estimated remaining IART that would need to be treated off-site using compensatory SWM. The off-site IART was significantly reduced between the SDEIS and FEIS from approximately 114 acres to approximately 2.5 acres. The significant reduction in required off-site IART is due to refinement of the preliminary design including grading, innovative design considerations, provision for both water quality and quantity in the same facility footprint, and the use of variances/waivers for quantity control that allows for use of areas within the LOD to provide more water quality treatment.

Table 3-4: Stormwater Management Provided Under the Preferred Alternative

Provided IAT (ac)	Remaining IART (ac)
207.59	2.39

Note: Provided SWM is for the work in Maryland only.

In Virginia, a preliminary stormwater analysis identified a pond retrofit and expansion to meet both the water quantity and quality requirements. Preliminary calculations indicated that the retrofit would provide both two-year and ten-year management. In addition, the retrofit is estimated to provide between 75 and 90 percent of the required nutrient load reduction. Credits for the remaining required nutrient load reduction can be purchased from a Nutrient Credit Bank. The exact nutrient load credits to be purchased will be determined during final design.

C. Compensatory (Off-Site) Stormwater Mitigation Plan Considerations

MDOT SHA evaluated alternative means for providing SWM due to the heavily urbanized areas and numerous resources along the study corridors that limited available area for on-site SWM. An extensive planning-level study was performed to identify compensatory, or off-site, SWM opportunities to ensure the SWM water quality requirements of the Preferred Alternative could be met. The results of this evaluation, as originally presented in the SDEIS, were modified for the FEIS based on further analysis that reduced the need for compensatory, or off-site, SWM, as documented above in **Section 3.1.6 B**.

The number of compensatory SWM sites were reduced for the FEIS by prioritizing sites closest to the corridor, within the impacted MDE 12-digit and 8-digit watersheds, and by eliminating sites that had impacts to private properties and environmental resources. The methodologies, assumptions, and evaluations documented below were used for this compensatory SWM analysis to support and inform the Joint Permit Application (JPA), the FEIS, and Record of Decision (ROD). The potential compensatory treatment identified for the FEIS exceeds the anticipated requirement; however, the intent is to provide an excess of potential compensatory SWM sites to be evaluated during final design. It is anticipated that sites may be dropped from consideration when they are deemed infeasible during final design and as a result of coordination with permitting agencies. With the excess of SWM sites provided, it is anticipated that there would still be an adequate amount of potential treatment to meet the SWM water quality needs.

All findings of the compensatory SWM efforts are documented in the *Compensatory Stormwater Mitigation Plan* (**FEIS, Appendix D**), the JPA, and **FEIS, Chapter 5** where impacts to environmental features would occur, and the ROD. This section summarizes the compensatory SWM requirements and potential water quality credit only.

a. Methodology and Assumptions

According to the Code of Maryland Regulations (COMAR), "the management of stormwater runoff is necessary to reduce stream channel erosion, pollution, siltation and sedimentation, and local flooding..." The quantification of the SWM required, water quality, and water quantity for a project is determined by the amount of existing impervious area and proposed impervious area located within the study area or LOD. While the MDE and MDOT SHA Water Quality Banking Agreement indicates SWM water quantity requirements must be met on-site for any given project, the SWM water quality requirements, while desirable to be met on-site, can be met elsewhere within the same MDE 6-digit watershed when on-site treatment is not practicable, with a hierarchal preference to meeting SWM water quality requirements within the same MDE 12-digit watershed as the impacts are located, before moving to the MDE 8-digit watershed, and ultimately the MDE 6-digit watershed, if needed. Additional information regarding a hierarchical approach in selecting compensatory, or off-site, SWM locations can be found in the *Compensatory Stormwater Mitigation Plan* (**FEIS, Appendix D**).

Initially for the compensatory SWM analysis presented in the SDEIS, LODs were identified for three types of sites: (1) SWM facilities, (2) stream restoration sites, and (3) pavement removal sites. However, as the on-site and compensatory SWM analysis was refined for the FEIS, only SWM facility sites, mainly ESD facilities but also structural facilities, were selected for inclusion in the Compensatory SWM Mitigation Plan and JPA. In general, SWM facility sites were selected to maximize MDOT SHA impervious area draining to the site and are primarily within the MDOT SHA right-of-way, to minimize impacts to private properties and historic and environmental resources (trees, wetlands, waterways, 100-year floodplains, etc.). If a SWM facility meets a minimum of one-inch treatment credit, full IAT credit for MDOT SHA impervious area will be achieved, otherwise the IAT for MDOT SHA impervious area will be pro-rated based on the amount of runoff (in inches) treated. For all non-MDOT SHA impervious areas draining to a facility, half of the IAT or removed is the resultant IAT credit.

Stream restoration sites are not included in the Compensatory SWM Mitigation Plan at this time because the requirements are anticipated to be met by the selected SWM facilities. If the selected sites are determined not feasible during final design, the Developer will utilize the site search approach as indicated in the SDEIS and in the Compensatory SWM Mitigation Plan, with consideration to a hierarchical approach for compensatory SWM sites, to evaluate additional sites and, if needed, revise the JPA and re-evaluate impacts.

To ensure full compliance with environmental requirements, impacts to forests, wetlands, waterways, floodplains, and properties were determined using desktop evaluations of compensatory SWM sites by the following disciplines: water resources, cultural resources, forestry, hazardous materials, maintenance of traffic, wetlands and waterways, right-of-way, parks/Section 4(f), structures, utilities, and constructability. All desktop evaluations were completed using readily-available data and were used to inform the LOD for each site. In addition to the desktop evaluations performed, field assessments were performed by the water resources, forestry, wetlands, and stream disciplines to inform the environmental resource delineations and better determine SWM feasibility. Compensatory SWM sites were removed after the desktop and field evaluations were completed if they resulted in multiple impacts to these resources. In general, sites were removed from further consideration if they impacted Section 4(f) properties, significant cultural resources (i.e., historic structures, archaeological sites), significant environmental features, or existing hazardous materials hot spots.

b. Compensatory Stormwater Management Requirements and Compensatory Stormwater Management Potential

The Compensatory SWM Mitigation Plan provides compensatory SWM sites to meet the target IART for the Preferred Alternative, through use of mainly ESD SWM facilities (**Table 3-5**) within the same MDE 12-digit and/or 8-digit watershed as the Preferred Alternative LOD. As stated above, the amount of compensatory IAT exceeds the need identified in **Table 3-4**; however, the intent of the plan is to provide an excess of potential compensatory SWM sites for more detailed analysis during final design.

Table 3-5: Preferred Alternative Compensatory SWM Potential

MDE 6-Digit Watershed	Target Compensatory SWM IART Requirement (ac)[1]	Compensatory SWM IAT Potential (ac)
Washington Metropolitan (No. 021402)	2.39	27.39

[1] Target SWM IART is approximate and for the work in Maryland only.

Further avoidance and minimization of impacts to resources that would be caused by the compensatory SWM sites will be investigated during final design. In addition, the use of alternate sites which could have fewer, or no impacts, will be considered in final design. Final environmental impacts associated with off-site treatment should not exceed those presented in the JPA, the Compensatory SWM Mitigation Plan, and those listed below in **Table 3-6**. While it may be possible that alternative compensatory SWM sites identified during final design could result in an increase in impacts, the full approval and permitting process would be required.

Table 3-6: Compensatory SWM Potential Environmental Impacts

Potential LOD Area (ac)	Potential Property Impact (ac)	Wetland Impact (ac/sf)			Wetland Buffer Impact (ac/sf)	Waterway Impact (lf/sf)				FEMA 100-Year Floodplain Impact (ac/sf)	Forest Impact (ac/sf)	Specimen Tree Impact (Count/ DBH)
		PFO	PSS	PEM		Perennial	Intermittent	Ephemeral	POW			
34.52	1.08	0 / 0	0 / 0	0 / 0	0 / 0	156 / 1,680	29 / 79	0 / 0	0 / 0	0.08 / 3,485	0.96 / 42,090	7 / 227

Note: Abbreviations are as follows— palustrine forested wetlands (PFO); palustrine scrub-shrub wetlands (PSS); palustrine emergent wetlands (PEM); acres (ac); square feet (sf); Federal Emergency Management Agency (FEMA); diameter at breast height (DBH).

3.1.7 Cross Culverts

Modifications to cross culverts along the study corridors for the Preferred Alternative in this FEIS included a more detailed hydrologic and hydraulic investigation based on additional topographic survey and refinements to the preliminary roadway geometric design. The approach for identifying cross culverts and cross culvert augmentation remains the same as presented in the **SDEIS, Chapter 2** and is repeated below. All major cross culverts, defined as culverts 36 inches in diameter or greater with a drainage area greater than 25 acres, were identified and analyzed to determine if they would need additional capacity in the proposed conditions. Major culverts were identified by desktop analysis using the MDOT SHA large and small structure database; LiDAR (light detection and ranging) topographic data with one-foot contours; the MDOT SHA NPDES database; and field observations.

If an existing culvert crossing needed additional capacity in the proposed conditions, then an auxiliary culvert has been proposed to meet the need. It was assumed that the auxiliary culverts could be installed using trenchless technologies (installing the culvert underground without disturbing the existing road) so as not to disrupt traffic traveling on the existing road. LOD assessments for construction access at the upstream and downstream end of the culvert were completed and area is provided for the implementation of trenchless technologies within the LOD. Existing culverts are also proposed to be extended for a new outfall structure to tie into the proposed grading limits for the Preferred Alternative.

After the need for the culvert augmentation was identified, further investigations including site visits and additional hydrologic and hydraulic computations, were conducted to determine the LOD at each location. For all proposed culvert augmentation sites in the Preferred Alternative and in preparation of the SDEIS, site visits were conducted to assess the existing site condition, as well as the potential LOD requirements as they relate to the existing condition and the proposed crossing modification. Several agencies, including the Federal Highway Administration (FHWA), United States Army Corps of Engineers (USACE), and MDE Nontidal Wetlands and Waterways, attended specific site visits to provide general feedback on the LOD requirements related to culvert augmentation.

To prepare for the site visit, a desktop review of each location was conducted, and the following data was compiled into an assessment form: existing and proposed culvert geometry, drainage area parameters, and an estimate of the potential capacity increase via augmentation. Additional site-specific information, such as upstream and downstream channel conditions including any bank erosion, channel head cutting, or other instability; notation of any unusual site circumstances including potentially impacted built infrastructure; and a photo documentation log, were added to the assessment form during the field investigations. Based on the field findings, LODs were proposed for each augmentation site, and they are included in the Preferred Alternative LOD and shown in **FEIS, Appendix E**.

Detailed hydrologic and hydraulic analysis will be completed during final design to confirm that augmentation is required. The detailed design will utilize additional data, including roadway and stream topographic survey, to analyze each culvert crossing location more thoroughly and will assess the hydraulic impacts associated with augmentation to confirm that the proposed design will meet the regulatory requirements. The increased capacity from culvert augmentation can lead to increased downstream discharges and velocities, which may result in increased downstream flooding. The addition of a culvert barrel can also lead to redistribution of channel flows and sediment transport, leading to aquatic organism passage barriers. Culvert augmentations will be designed with these considerations in mind. During final design, it is possible that culvert augmentation will not be needed at some previously identified locations or will be needed at other additional locations based on the detailed design.

3.1.8 Construction and Short-term Effects

Construction of the Preferred Alternative will be conducted in a heavily developed area constrained by existing residential and commercial development and environmental resources. Continued, detailed analysis was completed since publication of the SDEIS in coordination with the Developer to further assess constructability requirements relative to the existing constraints and to identify additional appropriate adjustments to the LOD and cost estimate. An overview of the factors that were considered for this analysis was provided in the **DEIS, Chapter 2** and **SDEIS, Chapter 2** and is summarized below.

The constructability analysis was based on assumptions and conceptual ideas about construction phasing, methodology, and the general sequence of how the work may proceed. These include construction sequencing, maintenance of traffic, availability of regional suppliers and contractors, and access, staging, and storage of equipment and materials. The Developer refined these assumptions in advancement of the proposed design concept and collaborated with MDOT SHA to adjust the LOD as needed. The assumed areas for construction staging, materials storage, and access needs within the Preferred Alternative LOD at specific locations are identified on the *Environmental Resource Mapping* (**FEIS, Appendix E**).

The approaches to complete the proposed work for the Preferred Alternative include mainline widening along I-495 and I-270, interchange reconstruction, and bridge replacement or reconstruction. The constructability analysis included coordination with the regulatory agencies at the properties or resources under their jurisdiction including the NPS, M-NCPPC, USACE, MDE, and Maryland Department of Natural Resources (DNR). Consideration was given to construction methods in challenging locations such as the ALB and the I-495 bridges over the Chesapeake and Ohio Canal and Clara Barton Parkway and widening adjacent to Thomas Branch (see **Section 3.1.8 A** and **Section 3.1.8 B** below).

The minimization of impacts to community, residential and commercial properties, and regulated resources such as cemeteries, parks, historic and archeological resources, and at wetlands and streams, to the greatest extent practicable, was included in the preliminary plans for construction of the Preferred Alternative. Techniques such as retaining wall construction in cut and fill sections were employed to minimize impacts. Additionally, avoidance and minimization of utility impacts was prioritized where feasible or the LOD accounts for utility relocations where impacts may be unavoidable. The quantified property impacts presented in this FEIS (**Chapter 5, Section 5.5**) are separated by permanent (or long-term) effects and temporary (or short-term) effects. Short-term, construction related work includes construction staging, material and equipment storage, construction easements, and other areas needed to support the construction, but are not part of the long-term improvements.

A. American Legion Bridge Construction Evaluation

The Preferred Alternative includes the full replacement of the ALB on I-495 spanning the Potomac River with a new, wider bridge on the existing centerline. The existing bridge is nearly 60 years old and would need to be replaced regardless of the outcome of this Study. The new bridge would also need to be constructed in a sequence to maintain the existing number of travel lanes during peak periods during construction. Comments on the Build Alternatives presented in the DEIS and the Preferred Alternative in the SDEIS reflected a common support for advancing replacement of the ALB.

As summarized in the **SDEIS, Chapter 2**, due to the location of the ALB over the Potomac River and adjacency to several federally-owned parks, MDOT SHA created a separate group – the ALB Strike Team – to investigate alternative bridge designs and construction techniques that could be employed to reduce, minimize, and avoid impacts to natural, cultural, and parkland resources around the ALB. The Strike Team coordinated with key agency and public stakeholders, including NPS, M-NCPPC, USACE, MDE, and Maryland DNR. The NPS properties that border the Potomac River at the ALB include the George Washington Memorial Parkway, the Chesapeake and Ohio Canal National Historical Park (including the Chesapeake and Ohio Canal Towpath and Plummers Island), and Clara Barton Parkway. The results of the effort were presented in the SDEIS and are still reflected in the Preferred Alternative in this FEIS.

Impacts to Plummers Island were significantly reduced compared to those presented for the Build Alternatives in the DEIS by strategically locating the proposed piers for the replacement bridge and eliminating construction access from the Island. Further, MDOT SHA commits to accessing Plummers Island for construction purposes by bridging over the oxbow of the Potomac River without placing any materials or fill within the stream channel. MDOT SHA and the Developer will work with NPS and the Washington Biologist Field Club to design for and construct slope armoring along the upstream side of Plummers Island to mitigate for future slope erosion as a result of tree clearing within the LOD. The slope armoring could include but is not limited to a rip-rap slope, live staking, and brush layering or any combination of armoring that will provide a blended natural aesthetic with the topography and historic nature of the island.

In addition, the total impacts at the bridge construction site were minimized as the Strike Team effort resulted in a reduction of the number of construction access locations from all four quadrants, as noted in the DEIS, to the northwest quadrant only, due to its grade and proximity to a nearby roadway. This change substantially minimized impacts to the surrounding land and resources. There are many construction challenges associated with replacement of the ALB, such as access constraints due to the natural areas along the river's edge. To limit the area of disturbance, MDOT SHA assumed that most construction activities at the ALB and Clara Barton Parkway interchange will be completed from below the existing bridges instead of from the existing roadway, due to the need to access elements such as the existing and proposed piers. The Preferred Alternative accounts for a proposed, temporary road within the Chesapeake and Ohio Canal National Historical Park to access the ALB construction area. The two-lane access road will be 40-feet wide to accommodate two-way construction traffic and queuing. The LOD for this access road is identified in **FEIS, Appendix E**.

In Virginia, the Preferred Alternative will result in temporary closure of the Potomac Heritage National Scenic Trail within the LOD during construction of the replacement ALB. A detour route, if determined to be necessary, will continue to be developed by MDOT SHA and the Developer in coordination with NPS, Fairfax County, and VDOT. The segment of the trail within the LOD would be restored on a new alignment after construction is completed. Refer to **Chapter 5, Section 5.4** for additional information on the minimization efforts around the ALB.

B. Thomas Branch Investigation

Thomas Branch runs parallel to I-495 and the I-270 west spur from the interchange of Democracy Boulevard and the I-270 west spur to the interchange of MD 190 (River Road) and I-495, for approximately three miles. The proposed Preferred Alternative roadway improvements along I-495 and I-270 would impact Thomas Branch for nearly the entire length where it runs parallel to and crosses under these roadways. An analysis of the impacts and minimization efforts along Thomas Branch were performed for the Build Alternatives for the DEIS. Further review efforts by the Developer continued after publication of the SDEIS and for this FEIS to review the scenarios considered by MDOT to limit impacts to the resource while refining the LOD for the Preferred Alternative.

Since the SDEIS, the Developer has refined the preliminary approach to relocate, pipe, or maintain the existing alignment of Thomas Branch. The current design concept proposes to eliminate the existing culvert crossing of the I-270 west spur north of Democracy Boulevard and instead, convey Thomas Branch along the east side of the I-270 west spur to a new culvert crossing south of Democracy Boulevard. This

change was incorporated to reduce the total culvert length along Thomas Branch and maintain portions of Thomas Branch as open channel. This design concept is shown in the JPA (**FEIS, Appendix P**). Refinements to the proposed construction methods and minimization techniques to limit impacts to Thomas Branch, including evaluation of hydraulic modeling, will continue through final design.

3.1.9 Tolling

As stated in the SDEIS, the Preferred Alternative includes tolling of the HOT managed lanes. The toll rates and the toll rate ranges were determined through a multi-step process that is codified in Maryland law, which provides for public input through public hearings and official public testimony. This process was outlined in the SDEIS and has advanced since the SDEIS was published. The toll rate ranges were approved by the Maryland Transportation Authority (MDTA) Board in Fall 2021, following the Notice of Availability for the SDEIS. This section provides a summary of the toll rate setting process and the approved toll rate ranges.

The toll-rate setting process was led by MDTA, the only State entity with the authority to set, revise, and fix toll rates in accordance with Transportation Article §4-312 of the Annotated Code of Maryland and COMAR Title 11 Department of Transportation, Subtitle 07 MDTA, Chapter 05 Public Notice of Toll Schedule Revisions (11.07.05). The MDTA is responsible for setting the toll rate ranges and, in collaboration with the Developer, conducting toll collection operations for the Phase 1 South limits.

The Preferred Alternative will be a variably priced facility that utilizes dynamic pricing. Maryland law requires the establishment of toll rate ranges for variably priced facilities, including those utilizing dynamic pricing, which is a method of calculating the toll where the pricing mileage rate varies within the approved toll rate range in real time. A dynamic facility uses operational metrics to adjust the toll in real time to maintain free-flowing traffic by using pricing factors to influence the traffic flow—when lanes become more congested, the toll increases, and when the lanes become less congested, the toll decreases. The toll rates within each tolling segment could change as often as every five minutes based on real-time traffic volumes or speed in the HOT lanes to provide customers who choose to use the HOT lanes and pay a toll, a faster and more reliable trip. Customers will pay the toll rate in effect when they enter the managed lanes, regardless of toll rate changes that occur in any tolling segment during their trip.

The MDTA-approved toll rates include a minimum toll, maximum toll rate ranges, soft rate caps, a process for annual toll escalation, and toll discounts for certain types of vehicles. The minimum and maximum toll rates are the lowest and highest toll rate per mile that would be charged in any tolling segment. The soft rate cap is the toll rate per mile that can only be exceeded when certain thresholds are met. More detailed explanations are provided below in **Section 3.1.9 B**. The toll rate ranges are limited to only Phase 1 South. Any action to set, revise and fix tolls outside of Phase 1 South limits would require a separate toll setting process in accordance with State law.

MDTA spent more than two years conducting due diligence activities on the toll rate range proposal which included traffic and revenue studies, post-model processing, and feedback from potential developers. The toll rate ranges approved by MDTA are available on their website at https://mdta.maryland.gov/ALB270TollSetting/TollRateRangeSettingProcessAndApprovedTollRateRanges. The following sections provide detail on the toll rate setting process and the approved MDTA toll rates.

A. Toll Rate Setting Process

The toll rate range setting process was described in the **SDEIS, Chapter 2, Section 2.3.6** and centered on a proposal by MDTA staff to establish minimum toll rates, maximum toll rates, soft rate caps within the minimum and maximum toll rate ranges, a process for annual toll escalation, and toll discounts for certain types of vehicles.

As noted above, the process for conducting the public hearings, recording comments from the public, and approving and finalizing the toll rate ranges is specified in Transportation Article, §4-312, Annotated Code of Maryland. The initial proposal was presented to the MDTA Board in May 2021. Per the process, the Board voted to take the toll proposal to public hearings and a public comment period, thereby ensuring the public was engaged in the toll rate range setting process and complying with State law by providing opportunities for public review and comment.

This first comment period lasted from May 20 through August 12, 2021. Two public hearings were held in July 2021. The material presented included the background and justification for the toll rate ranges (minimum and maximum per-mile rates), soft rate caps within the ranges, and discounts, as well as the process required for completing the hearings.

After consideration of the public comments, the MDTA staff presented the final toll rate range proposal at the September 30, 2021, MDTA Board Meeting. This final toll rate range was the recommended action for the Board and opened another comment period. The MDTA accepted written comments on the recommended action/final toll rate range proposal from September 30 through October 28, 2021. At the November 18, 2021, MDTA Board Meeting, the MDTA staff presented a summary and analysis of public comments received during the second public comment period. The comment summary and analysis were posted to the MDTA webpage at https://mdta.maryland.gov/ALB270TollSetting/. During this meeting, the MDTA Board voted to approve the final toll rate range. Before the Board voted, the public was provided a third opportunity to comment on the final toll rate range recommendation live during the meeting.

B. MDTA Approved Toll Rate Ranges

The goal of the HOT managed lanes is to maintain free-flowing traffic and to use pricing factors to influence traffic flow. The Preferred Alternative was designed to maintain speeds of 45 mph or greater in the HOT managed lanes, in compliance with Title 23 United States Codes (U.S.C.) 129 and 166. As such, the toll rate range was set to ensure the HOT managed lanes operate to established operational metrics, which applies the economic principles of supply and demand to influence the utilization of the HOT managed lanes. The Developer will be responsible for setting toll rates within the established toll rate ranges. The Developer will not only be responsible to ensure the free-flowing traffic goals but will also have to cover design, maintenance, finance, and operations costs from the generated toll revenue. The toll rate ranges will only be used if a ROD is signed by FHWA at the end of this Study and the HOT managed lanes are constructed.

The approved toll rate ranges are provided in **Table 3-7** in cost per mile ($/mile) for a passenger vehicle. The rate ranges for other vehicle classifications can be found on the MDTA webpage at https://mdta.maryland.gov/ALB270TollSetting/TollRateRangeSettingProcessAndApprovedTollRateRanges. The toll rate ranges will only apply to the HOT managed lanes; the existing free general purpose lanes will not be tolled. In addition, the approved rates include discounts for qualifying vehicles—including HOV

3+ (including carpools and vanpools), buses and motorcycles.[6] MDTA recognizes that designated HOV compliant vehicles are required to be toll-free under Title 23 U.S.C. 166; however, MDTA is using the term 'discount' to refer to all vehicles that would have a toll rate that is lower than the standard toll rate. The elements of the approved toll rate ranges are described in the following subsections.

Table 3-7: Approved Toll Rate Ranges, Soft Rate Caps, and Discounts (Free Passage) for Passenger Vehicle (2-axle) by Payment Type

General Purpose Lanes	HOT Managed Lanes					
	Payment Type	Approved Toll Rate Ranges for Passenger Vehicle (2-axle) (year 2021 $/mile)			HOV 3+ Vanpools Carpools	Buses / Motorcycles
		Minimum Toll Rate[1]	Soft Rate Cap	Maximum Toll Rate		
Free	Electronic Toll Collection (ETC) (*E-ZPass*)	$0.17	$1.50	$3.76	Free	Free
	Pay-By-Plate (Registered Video) (1.25x ETC)	$0.21	$1.88	$4.70		
	Video Tolling (Unregistered Video) (1.5x ETC)	$0.26	$2.25	$5.64		

[1] The minimum trip toll (not per mile) by payment type for all vehicle types would be $0.50 for customers using E-ZPass®, $0.63 for customers using Pay-By-Plate (Registered Video), and $0.75 for customers using Video Tolling (Unregistered Video).

a. Minimum Toll Rate

The minimum toll rate is the lowest toll rate per mile that will be charged at any tolling segment for the HOT managed lanes. The minimum toll rate is intended to cover toll capture, processing, and collection costs.

b. Soft Rate Cap

The soft rate cap is the toll rate amount that can only be exceeded when at least one of the following thresholds are met within a given tolling segment during the preceding five-minute period: the average traffic volume exceeds 1,600 passenger car equivalent vehicles per hour per lane or the average speed in a tolling segment is below 50 mph. The soft rate cap will always be lower than the maximum toll rate and can be exceeded only temporarily to provide customers who choose to pay a toll a faster and more reliable trip. The toll rate will continue to decrease once throughput and speed performance targets are achieved until it is at or below the soft rate cap.

MDTA is proposing the soft rate cap as a protection for customers. The purpose of the soft rate cap is to constrain the toll rate charged to customers when throughput and speed performance targets are achieved. This provides customers protection from toll increases when traffic conditions do not justify higher rates. Although not standard practice in the tolling industry, the MDTA is choosing to be one of

[6] Other exemptions, such as emergency vehicles during emergency response, have been agreed upon as part of the toll operations between MDTA, MDOT SHA and the Developer.

only two states in the United States to set a soft rate cap to constrain the toll rate as a protective measure for customers.

c. Maximum Toll Rate

The maximum toll rate is the highest per-mile toll rate that may be charged within any tolling segment for the HOT managed lanes. The actual per-mile rate paid by customers is responsive to real-time traffic. The maximum rates cannot be exceeded under any circumstance. The maximum rate will only be realized under conditions where the soft rate cap is exceeded, which would be during times of deteriorating performance. In extremely rare circumstances, when traffic demand is very high and customers are experiencing decreased speeds in a given tolling segment, the toll rate may reach the maximum toll rate for that given tolling segment. The toll rate is determined on a segment-by-segment basis. The maximum toll rate is required for the most congested tolling segments and likely would not come into effect for many segments.

d. Escalation

The toll rate ranges provided in **Table 3-7** are in 2021 $/mile. The minimum and maximum toll rate ranges, and the soft rate cap within them, will be adjusted annually according to pre-determined escalation factor equations. The adjustments are necessary to ensure the toll rates will (1) keep up with the growing traffic demand for the HOT managed lanes, (2) account for annual inflation, and (3) achieve the goal of providing a faster and more reliable trip for customers who choose to pay the toll. For the toll rates to effectively manage demand and ensure reliability for users of the HOT managed lanes into the future, the maximum per mile rates, soft rate caps, and video surcharge rates will escalate over time to account for inflation, population employment, and income growth. The minimum per mile toll rate ranges and the minimum trip tolls are both subject to escalation for inflation only.

3.2 Transportation Commitments

Beyond the Preferred Alternative elements described in **Sections 3.1.4** and **3.1.5** of this Chapter, additional priority transit and bicycle and pedestrian improvements have been committed to in response to comments and input received through extensive coordination with agencies and stakeholders over the course of the Study. These commitments further support elements of the Study's Purpose and Need. The priority transit and bicycle and pedestrian improvement commitments are described below. These commitments along with the mitigation described in **Chapter 7, Section 7.2**, will be included in the ROD and the lead agencies will be responsible for ensuring implementation.

3.2.1 Transit

The commitment to certain regional transit improvements to enhance existing and planned transit and support new opportunities for regional transit service is outlined below:

- Increase the number of bus bays at WMATA Shady Grove Metrorail Station
- Increase parking capacity at Westfield Montgomery Mall Transit Center

Some commitments have been made by the Developer or MDOT SHA as part of the P3 Agreement and are captured separately in **Chapter 7, Section 7.3**. The commitments related to transit include the following:

- As part of its proposal, the Developer has proposed an estimated $300 million for transit services in Montgomery County over the operating term of Phase 1 South
- Upon financial close of the Section P3 Agreement for Phase 1 South, MDOT is committed to fund not less than $60 million for design and permitting of high priority transit investments in Montgomery County and MDOT committed to deliver the Metropolitan Grove Bus O&M Facility, including the necessary bus fleet

Refer to **Section 3.1.4** of this Chapter for a description of the opportunities to enhance transit mobility and connectivity within the Preferred Alternative.

3.2.2 Pedestrian and Bicycle Facilities

Pedestrian and bicycle improvements and new connections that are beyond the base design approach described in **Section 3.1.5**, include:

- Constructing a new pedestrian/bicycle shared use path across the ALB to connect facilities in Maryland and Virginia, as discussed further below. A direct connection of the shared use path from the ALB to the Chesapeake and Ohio Canal towpath has been incorporated into the preliminary design. MDOT SHA and the Developer will continue to coordinate with NPS to review the condition of the existing connection between the Chesapeake and Ohio Canal towpath and the MacArthur Boulevard sidepath outside of the study area.
- Widening the existing variable-width sidepath along the east side of Seven Locks Road under I-495 (Cabin John Trail).
- Constructing a new sidewalk along the west side of Seven Locks Road under I-495 to reestablish the historic connection between First Agape AME Zion Church (Gibson Grove Church) and Morningstar Tabernacle No. 88 Moses Hall and Cemetery.

As presented in the **SDEIS, Chapter 2**, MDOT, with support from VDOT, proposes to reconstruct the ALB with a new pedestrian and bicycle shared use path to provide multimodal connectivity across the Potomac River. The shared use path is anticipated to be located along the east side of the ALB as shown in **FEIS, Appendix E**. The path would connect to the planned Fairfax County trail system in Virginia. An existing Fairfax County trail on the west side of I-495 will be extended by VDOT through the 495 NEXT project along the outer loop and inner loop of I-495 to the George Washington Memorial Parkway. The ALB shared use path along the inner loop will then extend along I-495 through the George Washington Memorial Parkway interchange as part of the Preferred Alternative to connect to the Fairfax County trail.

Three preliminary options for a proposed shared use path connection between the ALB and MacArthur Boulevard sidepath in Maryland were evaluated and were presented in the **SDEIS, Chapter 2**. The options were developed in coordination with the key agency stakeholders including the NPS, MCDOT, M-NCPPC, and the USACE.[7] Public comments supporting a direct connection of the shared use path from the ALB to the Chesapeake and Ohio Canal towpath were received by MDOT SHA, FHWA, and NPS during the SDEIS public comment period. To be responsive to these comments, a direct connection to the Chesapeake and Ohio Canal towpath has been incorporated into the preliminary design and is accounted for in the

[7] USACE was involved in this evaluation as some of the shared use path connection options would result in increased impacts to wetlands and waters.

Preferred Alternative LOD and impact analyses. The three shared use path options connecting to MacArthur Boulevard presented in the SDEIS are no longer under consideration in this FEIS. The direct connection to the Chesapeake and Ohio Canal towpath results in fewer impacts to NPS property and natural resources. MDOT SHA and the Developer will continue to coordinate with NPS to review the condition of the existing connection between the Chesapeake and Ohio Canal towpath and the MacArthur Boulevard sidepath outside of the study area. Additionally, MDOT SHA and the Developer, in coordination with NPS, will evaluate drainage and sight distance considerations at the intersection of the shared use path from the ALB and the Chesapeake and Ohio Canal towpath during final design. The alignment of the proposed shared use path connection to the Chesapeake and Ohio Canal towpath is shown in **FEIS, Appendix E**.

As noted in **Section 3.2.1**, some commitments have been made by the Developer as part of the P3 Agreement. The commitments related to improvements to fund priority bicycle and pedestrian connections to remove barriers and provide connectivity for bicyclists and pedestrians, as part of its commitment to support Vision Zero,[8] are outlined below:

- Defining a neighborhood walk and cycle connectivity zone to enhance multimodal connectivity.
- Facilitating the development of a facility improvement program for the installation or replacement of sidewalks, crossings, or signal modifications and formalizing trail development that has pedestrian demand, then rank projects according to safety significance (considering predictive safety analyses completed by M-NCPPC), readiness, and landowner consensus, as part of its commitment to support Vision Zero.

3.3 Phase 1 P3 Agreement and Predevelopment Work

The Phase 1 P3 agreement process, including selection of the Phase Developer, was summarized in the **SDEIS, Chapter 2**. Additional information provided in this FEIS includes details about the advancement of predevelopment work by the Phase Developer since the SDEIS and the selection process for the Design-Build contractor(s). Within this FEIS, outside of **Section 3.3**, the Phase Developer is referred to as the Developer. The following definitions of limits are provided to assist in understanding the phased solicitation process:

- Phase 1: I-495 from south of the ALB to I-270 and I-270 from I-495 to I-70. These are also the limits of the Phase 1 P3 Agreement.
- Phase 1 South: I-495 from south of the ALB to I-270 and I-270 from I-495 to I-370. These are the limits of the NEPA Preferred Alternative.

How has the P3 process advanced since the SDEIS?

- The Phase Developer worked collaboratively with MDOT, MDTA, and stakeholders on predevelopment work for Phase 1 South to inform this FEIS.
- The Phase Developer has advanced a competitive procurement process to short-list and select the Design-Build contractor(s) who will be responsible for the final design and construction of all of Phase 1 South.
- The Developer will be responsible to MDOT for performing the entire scope, which also includes financing, operations, and maintenance for the first phase.

[8] Vision Zero is an initiative to eliminate all traffic fatalities and severe injuries. https://www.montgomerycountymd.gov/visionzero/index.html

- Phase 1 North: I-270 from I-370 to I-70. This project is advancing under a separate planning study (https://oplanesmd.com/i270-environmental/).

The Preferred Alternative in this FEIS is aligned with Phase 1 South, which is the first section planned to be delivered under Phase 1: the New ALB I-270 Traffic Relief Plan. Under the Preferred Alternative, consideration of improvements to the remaining parts of I-495 would be required to advance separately, subject to additional environmental studies, analysis, and collaboration with the public, stakeholders, and agency partners. Additional improvements would proceed through subsequent P3 solicitation(s) or a public project delivery model, such as Design-Build.

In accordance with the terms and conditions of the Phase 1 P3 Agreement, MDOT and the Phase Developer have initiated and will further advance predevelopment work on the first section, Phase 1 South.

3.3.1 Selection of the Phase Developer

The Board of Public Works (BPW) originally approved the P3 designation for the P3 Program in June 2019 and provided a supplemental approval in January 2020. These approvals allowed MDOT SHA to use a Progressive P3 process to design, construct, finance, operate, and maintain Phase 1 of the P3 Program, by seeking a phase developer for Phase 1. This progressive approach allowed the solicitation process to proceed without final commitment during the NEPA process. The Phase 1 P3 solicitation process was described in **SDEIS, Chapter 2**.

In August 2021, in accordance with Maryland law, MDOT and MDTA received approval from the BPW to award the Phase 1 P3 Predevelopment Agreement to the Phase Developer. Predevelopment work related to Phase 1 South of the P3 Program is being completed by the Phase Developer and they will also support the predevelopment work for Phase 1 North (under a separate planning study) to inform the NEPA process.

3.3.2 NEPA and the Developer Work Together

As noted, Phase 1 South will be delivered using a Progressive P3 approach, which is designed to minimize risks to the State, provide more-efficient pricing, better schedule certainty, and support a phased delivery approach of the Preferred Alternative identified in this FEIS.

The Phase Developer is working collaboratively with MDOT, MDTA, and the stakeholders on predevelopment work for Phase 1 South. This upfront effort focused on advancing the preliminary design and due-diligence activities by involving all stakeholders – including Montgomery County, municipalities, property owners, utility owners, and citizens. As stated at the beginning of this Chapter, during the predevelopment work leading up to the FEIS, the Phase Developer focused on refining the preliminary design concept and further avoidance and minimization of impacts to environmental resources, communities, properties, utilities, and other features.

Concurrent with the predevelopment work, the Phase Developer has advanced a procurement process to select the Design-Build contractors who will subcontract with them to perform final design and construction of all of Phase 1 South. The Phase 1 Developer will be responsible for the overall final design, construction, financing, operations, and maintenance of all of Phase 1 South.

3.4 Economic Benefits of Managed Lanes and the Preferred Alternative

What are the benefits of Managed Lanes?

- All travelers on the highway system and the local area network benefit from managed lanes because managed lanes improve highway operations and provide the driving public, as well as transit riders, with reduced congestion and improved safety. Travelers who choose to pay a toll will experience reliable and reduced travel times.
- Travelers who continue to use the free (general purpose) lanes will also see reduced travel times as seen along the I-495 and I-95 HOT Lanes in Virginia and the I-95 Express Toll Lanes north of Baltimore. This will help reduce the cost of congestion to the average commuter in the region.

There will be significant economic benefit to the State of Maryland and the National Capital Region with the Preferred Alternative, Alternative 9 – Phase 1 South. The improvements will provide for faster and more reliable movement of goods and services and improved access to employment centers and housing. The delivery of these improvements will lead to more jobs. The preliminary, estimated capital cost for the Preferred Alternative is greater than $3 billion and will support thousands of jobs per year during construction. The Preferred Alternative will result in savings to the Transportation Trust Fund by providing more than one billion in infrastructure investment for state of good repair to the existing roads and bridges that needs to be completed, allowing public funds to be used for other necessary transit and highway improvements. Additionally, this project will boost Maryland's competitiveness in the region.