2 ALTERNATIVES DEVELOPMENT AND EVALUATION

The analysis of the Build Alternatives was documented in the Draft Environmental Impact Statement (DEIS), Chapter 2 and DEIS, Appendix B, Alternatives Technical Report and can be viewed through the following links on the Program website:

DEIS, Chapter 2: https://www.oplanesmd.com/wp-content/uploads/2020/11/2020-06-02_DEIS_02_Alternatives_Development.pdf

Alternatives Technical Report (DEIS, Appendix B): https://www.oplanesmd.com/wp-content/uploads/2020/07/DEIS_AppB_Alts_web.pdf

The analysis of the Build Alternatives and identification of the Preferred Alternative was documented in the Supplemental DEIS (SDEIS), Chapter 2.

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

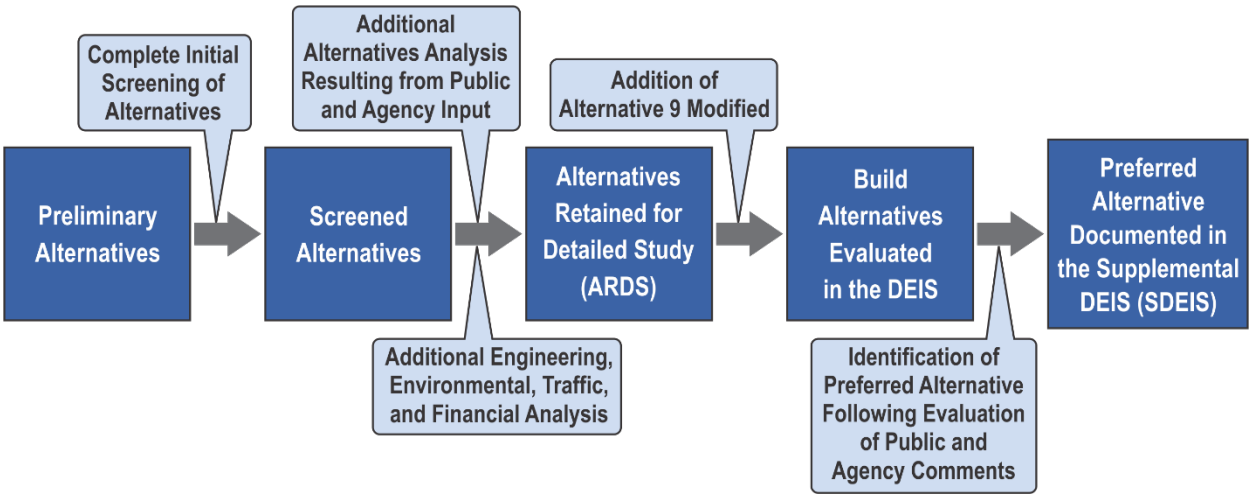
The purpose of this chapter is to summarize the alternatives development and evaluation process for the I-495 & I-270 Managed Lanes Study (Study) that led to the determination of the Preferred Alternative for this Final Environmental Impact Statement (FEIS).

Preparation of an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA) involves identification of a reasonable range of alternatives to carry out the proposed federal action. The Maryland Department of Transportation State Highway Administration (MDOT SHA) analyzed a broad scope of preliminary alternatives to create a list of alternatives being carried forward for more detailed analysis as documented in the **DEIS, Chapter 2**. A reasonable range of alternatives are those that meet the Study's Purpose and Need and include those that are practical or feasible from the technical and economic standpoints and using common sense (Council on Environmental Quality [CEQ], 40 Questions, Response to Question 2a).[1]

The alternatives development and screening process for the Study followed five steps to narrow the Preliminary Range of Alternatives under consideration to the Preferred Alternative as shown in **Figure 2-1**. The results and documentation of the first four steps were presented in the Study's **DEIS, Chapter 2** and the last step, identification of the Preferred Alternative, was documented in the **SDEIS, Chapter 2**.

[1] Council on Environmental Quality, Memorandum to Agencies: Forty Most Frequently Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Federal Register 18026 (March 23, 1981), as amended (1986); Question 2a.

Figure 2-1: Alternatives Screening Process



2.1 Preliminary Alternatives

Fifteen Preliminary Alternatives were identified from previous studies and planning documents, and input from the public, and federal, state, and local agencies during the NEPA scoping process. The Preliminary Alternatives included the No Build Alternative as well as alternatives that included elements such as Transportation Systems Management (TSM)[2]/ Transportation Demand Management (TDM),[3] additional general purpose lanes, High-Occupancy Vehicle (HOV) lanes, priced managed lanes, collector-distributor lanes, contraflow lanes, reversible lanes, and transit. Stand-alone transit alternatives considered three transit modes: heavy rail, light rail, and bus. Additionally, options were identified for alternatives that could be applied to either I-495 or I-270 as well as different transit modes. Some of the alternatives included lettered options which reflect whether the options were exclusively applicable to I-495 or I-270 or were related to a specific transit mode. The Preliminary Alternatives were:

- Alternative 1: No Build
- Alternative 2: Transportation Systems Management/Transportation Demand Management (TSM/TDM)
- Alternative 3: Add one general purpose lane in each direction on I-495 and I-270
- Alternative 4: Add one HOV lane in each direction on I-495 and retain existing HOV lane in each direction on I-270
- Alternative 5: Add one priced managed lane in each direction on I-495 and convert one existing HOV lane in each direction to a priced managed lane on I-270
- Alternative 6: Add two general purpose lanes in each direction on I-495 and I-270
- Alternative 7: Add two HOV lanes in each direction on I-495 and retain one existing HOV lane and add one HOV lane in each direction on I-270

[2] TSM are actions that improve the operation and coordination of transportation services and facilities.
[3] TDM is a variety of strategies, techniques, or incentives aimed at providing the most efficient and effective use of existing transportation services and facilities (e.g., rideshare and telecommuting promotion, managed lanes, preferential parking, road pricing, etc.)

- Alternative 8: Add two priced managed lanes in each direction on I-495 and add one priced managed lane in each direction and retain one existing HOV lane in each direction on I-270
- Alternative 9: Add two priced managed lanes in each direction on I-495 and convert one existing HOV lane to a priced managed lane and add one priced managed lane in each direction on I-270
- Alternative 10: Add two priced managed lanes in each direction on I-495 and on I-270 and retain one existing HOV lane in each direction on I-270 only
- Alternative 11: Physically separate traffic using collector-distributor lanes, adding two general purpose lanes in each direction on I-495
- Alternative 12A: Convert existing general purpose lane on I-495 to contraflow lane during peak periods
- Alternative 12B: Convert existing HOV lane on I-270 to contraflow lane during peak periods
- Alternative 13A: Add two priced managed reversible lanes on I-495
- Alternative 13B: Convert existing HOV lanes to two priced managed reversible lanes on I-270
- Alternative 13C: Add two priced managed reversible lanes and retain one existing HOV lane in each direction on I-270
- Alternative 14A: Heavy Rail[4] transit
- Alternative 14B: Light Rail[5] transit
- Alternative 14C: Fixed guideway Bus Rapid Transit (BRT)[6] off alignment of existing roadway
- Alternative 15: Add one dedicated bus lane on I-495 and I-270

Modifications to the Preliminary Alternatives were made in response to public and agency input received during and after the Alternatives Public Workshops held in July 2018. In response to public and agency comments to retain alternatives that maintained opportunities for HOV benefits on I-270, MDOT SHA further defined the term priced managed lanes as either High-Occupancy Toll (HOT) lanes or Express Toll Lanes (ETLs), and the descriptions of certain alternatives were modified accordingly. For alternatives that would retain the existing HOV lanes on I-270, the added priced managed lanes were defined as ETL, where all vehicles in the ETL would be tolled. For alternatives that would involve the conversion of the existing HOV lanes on I-270, the priced managed lanes were defined as HOT lanes. For purposes of the alternatives evaluated in this Study, the existing HOV 2+ lanes on I-270 would be converted to HOT lanes, which includes the following operational structure:

[4] Heavy Rail is a mode of transit service (also called metro, subway, rapid transit, or rapid rail) operating on an electric railway with the capacity for a heavy volume of traffic. It is characterized by high speed and rapid acceleration passenger rail cars operating singly or in multi-car trains on fixed rails.
[5] Light Rail is a mode of transit service (also called streetcar, tramway, or trolley) operating passenger rail cars singly (or in short trains) on fixed rails. Light rail vehicles are typically driven electrically with power being drawn from an overhead electric line via a trolley or a pantograph and driven by an operator on board the vehicle.
[6] Bus Rapid Transit is a high-quality bus-based transit system that delivers fast and efficient service that may include dedicated lanes, busways, traffic signal priority, off-board fare collection, elevated platforms, and enhanced stations.

1. Qualifying or eligible HOVs may use the managed lanes for free under Title 23 USC 166 authority. Vehicles with three or more occupants (HOV 3+) would be eligible for the HOV status.

2. All other lower-occupancy vehicles (two-occupant and single occupant vehicles [SOV]) would be tolled at the full toll rate.

2.2 Screening Criteria

The Screening of the Preliminary Alternatives was completed by applying screening criteria related to the Study's Purpose and Need to each alternative. This process involved application of 15 metrics using a "high, medium, low" or "yes and no" approach. The evaluation of the Screened Alternatives assessed each alternative under the six major elements related to the Study's Purpose and Need:

- Engineering considerations:
  - Accommodates existing traffic and long-term traffic growth
  - Improves trip reliability
  - Provides additional roadway travel choice
  - Provides ease of use for travelers
- Accommodates homeland security
- Improves the movement of goods and services
- Enhances multimodal mobility and connectivity
- Financial viability
- Environmental considerations

The screening criteria used to determine the Alternatives Retained for Detailed Study (ARDS) were the same used for the initial screening of the Preliminary Alternatives but were refined by additional data to further differentiate between an alternative's ability to meet the Study's Purpose and Need. A detailed summary of the screening criteria and process was presented in the **DEIS, Chapter 2** and **DEIS, Appendix B**, *Alternatives Technical Report*.

The initial screening of the Preliminary Alternatives also considered initiatives and projects outlined in the *Visualize2045* Plan, the latest financially Constrained Long-Range Plan (CLRP) that was approved by the National Capital Region Transportation Planning Board on October 17, 2018. (An update to this plan is currently underway and is anticipated to be finalized for approval in 2022[7].) The *Visualize2045* Plan identified Seven Aspirational Initiatives for a Better Future. One of the seven initiatives is "Expand Express Highway Network," which includes congestion-free toll roads, building on an emerging toll road network, and new opportunities for transit and express buses to travel in the toll lanes. For more information on this initiative refer to:
http://mwcog.maps.arcgis.com/apps/Cascade/index.html?appid=debc2550777b4cc2bae2364c7712a151

[7] The proposed 2022 update to *Visualize2045* includes the addition of Maryland's construction of the American Legion Bridge I-270 to I-70 Relief Plan - Phase 1 South, starting in the vicinity of the George Washington Memorial Parkway in Virginia, including the American Legion Bridge, and provides two HOT lanes in each direction from I-495 to I-270 and then along I-270 from I-495 to I-370.

Three specific, financially constrained projects in the approved 2018 *Visualize2045* Plan that relate to this Study are:

- CLRP-constrained element ID-1182: I-95/I-495 component of Traffic Relief Plan to include two managed lanes in each direction, between the Baltimore Washington Parkway and the Virginia State Line/Potomac River at the Woodrow Wilson Bridge.
- CLRP-constrained element ID-3281: I-95/I-495 component of Traffic Relief Plan to include two managed lanes in each direction, between the Baltimore Washington Parkway and the Virginia State Line/Potomac River at the American Legion Bridge.
- CLRP-constrained element ID-1186: I-270 component of Traffic Relief Plan, to include two managed lanes in each direction, between I-495 and I-70/US 40.

For more information about these three projects, refer to *Appendix B – Summary of Projects in the Financially Constrained Element*: https://www.mwcog.org/documents/2018/10/17/visualize-2045-a-long-range-transportation-plan-for-the-national-capital-region-featured-publications-tpb-visualize-2045/.

This Study considered whether an alternative was consistent with the *Visualize2045* Plan in the initial screening process, but no alternative was dismissed for this reason alone.

2.3 Screened Alternatives

The Preliminary Alternatives were evaluated by applying the screening criteria established from the Study's Purpose and Need (as described in **Section 2.2** of this Chapter), using a general, qualitative assessment of readily available information. An alternative was dropped from further consideration only if the available information demonstrated it clearly did not meet the Study's Purpose and Need. Screened Alternatives were identified as those that met the screening criteria or required additional analysis to determine their ability to meet the Purpose and Need.

As a result of the initial screening, seven alternatives were recommended to be advanced for further detailed analysis and 13 alternatives were dropped from further consideration. Alternatives 1, 5, 8, 9, 10, 13B, and 13C were recommended for further analysis and environmental evaluation as the Screened Alternatives:

- Alternative 1: No Build – Though this alternative does not meet the Study's Purpose and Need, consistent with NEPA requirements, it was carried forward for further evaluation to serve as a base case for comparing the other alternatives
- Alternative 5: Add one HOT lane in each direction on I-495 and convert one existing HOV lane in each direction to a HOT lane on I-270
- Alternative 8: Add two ETLs in each direction on I-495 and add one ETL in each direction and retain one existing HOV lane in each direction on I-270
- Alternative 9: Add two HOT lanes in each direction on I-495 and convert one existing HOV lane to a HOT lane and add one HOT lane in each direction on I-270
- Alternative 10: Add two ETLs in each direction on I-495 and on I-270 and retain one existing HOV lane in each direction on I-270 only

- Alternative 13B: Add two HOT lanes in each direction on I-495 and convert existing HOV lanes to two reversible HOT lanes on I-270
- Alternative 13C: Add two ETLs in each direction on I-495 and add two reversible ETLs and retain one existing HOV lane in each direction on I-270

Screened Alternatives 8, 10, and 13C would retain the existing HOV lanes on I-270 and Screened Alternatives 5, 9, and 13B would involve the conversion of the existing HOV lanes on I-270 to HOT lanes. Alternatives 2, 3, 4, 6, 7, 11, 12A, 12B, 13A, 14A, 14B, 14C, and 15 were dropped from further consideration during the initial alternatives screening because they did not meet the screening criteria established by the Study's Purpose and Need. Additional information about the screening of these alternatives was documented in the **DEIS, Chapter 2** and **DEIS, Appendix B**, *Alternatives Technical Report*.

2.4 Alternatives Retained and Evaluated in DEIS

In February 2019, the Screened Alternatives were presented to the public through the Study website via written documentation and a video. Additional engineering, traffic, financial, and environmental analyses were completed, and used to determine the reasonableness of the Screened Alternatives to be carried forward as the ARDS. The Recommended ARDS included all seven Screened Alternatives. They were presented at eight Spring 2019 Public Workshops and were then further analyzed.

At that point, the FHWA and MDOT SHA determined that Alternative 5 was not a reasonable alternative because of its deficiencies in addressing existing traffic and long-term traffic growth and trip reliability, as well as concerns with the alternative's financial viability. Consequently, it was determined that Alternative 5 did not meet the Study's Purpose and Need and would not be retained as one of the ARDS. Alternative 5 was included in the comparison of impacts in **DEIS, Chapter 3** and **DEIS, Chapter 4** but was not retained as one of the ARDS or Build Alternatives.

Following the Spring 2019 Public Workshops and agency meetings, several Cooperating and Participating Agencies requested that MDOT SHA evaluate an alternative that would provide an alternate route for travelers to use MD 200 (Intercounty Connector) instead of the top side of I-495 between I-270 and I-95 to avoid or reduce impacts to significant, regulated resources and residential relocations. This new alternative, the MD 200 Diversion Alternative, was developed and analyzed with input from the agencies. After evaluation, it was determined that the MD 200 Diversion Alternative would not address the Study's Purpose and Need of accommodating long-term traffic growth, enhancing trip reliability, or improving the movement of goods and services. A summary of the MD 200 Diversion Alternative analysis was included in the **DEIS, Chapter 2** and **DEIS, Appendix B**, *Alternatives Technical Report*.

Following the Cooperating Agencies' concurrence[8] on the ARDS, MDOT SHA and FHWA evaluated an additional alternative, called Alternative 9 Modified (Alternative 9M), in response to public and agency input. Alternative 9M consisted of a blend of Alternatives 5 and 9 with the primary difference on the top side of I-495 between I-270 and I-95 being the addition of one managed lane per direction instead of two managed lanes. Alternative 9M was evaluated and determined to be a reasonable alternative, and thus was included as a Build Alternative in the DEIS.

[8] NCPC abstained from concurring on the ARDS; M-NCPPC did not concur on the ARDS.

The **DEIS, Chapter 3**, **DEIS, Chapter 4,** and **DEIS, Appendix B**, *Alternatives Technical Report* presented the additional analysis and comparison of impacts between the Build Alternatives (Alternatives 8, 9, 9M, 10, 13B, 13C) and the No Build Alternative, plus Alternative 5 for comparison purposes.

2.5 Identification of Preferred Alternative

CEQ guidance describes an "agency's preferred alternative" as one that the agency believes would fulfill its statutory mission and responsibilities, considering economic, environmental, technical, and other factors.[9] During the NEPA process, and especially based on input from partner agencies, stakeholders, and the public following publication of the DEIS, the FHWA and MDOT SHA considered many common themes reflected in the comments. In January 2021, Alternative 9 was announced as the MDOT SHA Recommended Preferred Alternative based on the results of traffic, engineering, financial, and environmental analyses, as well as public comment. However, after several months of further coordinating with and listening to agencies and stakeholders and reviewing public comments FHWA and MDOT SHA identified a new Preferred Alternative in the SDEIS: Alternative 9 – Phase 1 South.

Alternative 9 – Phase 1 South includes the same improvements proposed as part of Alternative 9, two HOT managed lanes in each direction along I-495 and I-270, but within the Phase 1 South limits only. The limits of Phase 1 South are along I-495 from the George Washington Memorial Parkway in Virginia to west of MD 187 in Maryland and along I-270 from I-495 to just north of I-370 and on the I-270 east and west spurs. There is no action, or no improvements, included at this time on I-495 east of the I-270 east spur to MD 5. The specific elements of the Preferred Alternative are presented in **Chapter 3** and the detailed traffic analysis is presented in **Chapter 4** of this document. As described in greater detail in **Chapter 4**, the Preferred Alternative is projected to provide meaningful operational benefits to the regional system even though it includes no action for a large portion of the study area and avoids and minimizes impacts.

The FHWA and MDOT SHA's selection of the Preferred Alternative was based on currently available information and consideration of comments received on the DEIS. The agencies received many comments supporting the need to address improvements to the American Legion Bridge, a major regional traffic bottleneck as soon as possible; to avoid property displacements, avoid and minimize public parkland impacts to the maximum extent practicable in compliance with Section 4(f) regulations; to coordinate with planned managed lane projects in Northern Virginia to provide a seamless regional managed lanes system; and to increase multi-modal transportation options in the study area.

Many of these key concerns and comments raised by the agencies and public through review of the DEIS were common among the Build Alternatives retained including, but not limited to, stormwater management, direct access, transit elements, noise, property impacts, and proposed relocations. Identifying a Preferred Alternative allowed the lead agencies to continue the coordination, design, and analysis effort on a single alternative in the SDEIS and this FEIS. The efforts to further address comments, avoid and minimize impacts, and determine mitigation for unavoidable impacts continued through the development of this FEIS. A detailed description of the elements of the Preferred Alternative are presented in **Chapter 3** of this document.

[9] Council on Environmental Quality, Memorandum to Agencies: Forty Most Frequently Asked Questions Concerning CEQ's National Environmental Policy Act Regulations, 46 Federal Register 18026 (March 23, 1981), as amended (1986); Question 4a.