Contents

Executive Summary ................................................................................................. ES-1
Conversion of HOV-2 designation on I-66 Outside the Capital Beltway to HOV-3 Technical Report
Introduction ............................................................................................................. 1
Study Area ................................................................................................................ 1
Federal Laws and Requirements ............................................................................. 2
  Occupancy Requirements of the HOV Facility ......................................................... 3
  HOV Facility Management ...................................................................................... 3
  HOV Facility Minimum Average Operating Speed .................................................. 3
  Degraded HOV Facility .......................................................................................... 3
  Maintenance of Operating Performance ................................................................. 3
I-66 HOV Facility Compliance with Federal Law ..................................................... 4
Definition and Evaluation of Mitigation Alternatives ............................................. 7
  Definition of Alternatives ...................................................................................... 7
  Evaluation of Alternatives ..................................................................................... 8
Conditions in the Code of Virginia ......................................................................... 15
  Notice of Intent to Change Existing Designation ................................................... 16
  Public Hearings .................................................................................................... 19
  Need for Change in HOV Designation .................................................................. 20
  Support for Change in HOV Designation .............................................................. 20
Metropolitan Washington Area Transportation Plans FOR HOV .......................... 20
VDOT Degradation Mitigation Plan ....................................................................... 21
Conclusions and Recommendations ...................................................................... 21

Attachments

Virginia Quarterly Update of HOV Hybrid Vehicle Exemption Certification and Degradation Mitigation Plan – I-66 Outside Beltway (August 17, 2015 Transmittal to FHWA)

VDOT Commissioner’s Annual Report to Virginia General Assembly on Degraded HOV Facilities
  • November 10, 2015
  • September 12, 2014
Figures

Figure 1 - I-66 Outside the Beltway Corridor .................................................................2
Figure 2 - Travel Time Trend from 1996 to 2014 on I-66 Eastbound Outside the Beltway During AM Peak Period (5:00 AM - 10:00 AM) .................................................................5
Figure 3 - Congestion Trend on Eastbound HOV Lane on I-66 Outside the Beltway ................6
Figure 4 - Congestion Trend on Westbound HOV Lane On I-66 Outside the Beltway............7
Figure 5 - Travel Speed Trends (I-66 Outside the Beltway, AM Peak Period) .....................9
Figure 6 - Travel Speed Trends (I-66 Outside the Beltway, PM Peak Period) .....................10
Figure 7 - Travel Speeds on Eastbound I-66 Outside the Beltway Under Different Mitigation Strategies in AM Peak Hour .................................................................11
Figure 8 - Travel Speeds on Westbound I-66 Outside the Beltway Under Different Mitigation Strategies in PM Peak Hour .................................................................12
Figure 9 - Travel Speed on Eastbound I-66 Outside the Beltway Under Different Mitigation Strategies for each Segment in AM Peak Hour ..................................................13
Figure 10 - Travel Speed on Westbound I-66 Outside the Beltway Under Different Mitigation Strategies for each Segment in PM Peak Hour ........................................14
EXECUTIVE SUMMARY

This report summarizes the operational conditions of the existing High Occupancy Vehicle (HOV) facilities on I-66 outside the Capital Beltway (I-495), and addresses mitigation measures to improve the current congested operations in the I-66 HOV lanes. A key focus of the mitigation discussed in this report is the conversion of the minimum vehicle occupancy requirements from two people to three people per vehicle.

Along I-66, between US Route 29 at Gainesville and I-495, the left-most eastbound lane is restricted to vehicles with two or more occupants (HOV-2) during the AM peak period, from 5:30 to 9:30 AM. Conversely, in the westbound direction, the left-most lane of I-66 is restricted to HOV-2 traffic during the PM peak period, from 3:00 to 7:00 PM. These restrictions are in a concurrent HOV lane, with no physical separation from the adjacent general purpose lanes. Vehicles can change lanes from the restricted HOV lane to the adjacent general purpose lanes and vice versa at any point between Gainesville and the Capital Beltway on I-66.

Several previous operational studies of the current HOV system on I-66 have shown that the HOV lanes no longer meet the Federal minimum average operating speed requirements for HOV facilities, and can be considered to be “degraded.” Based on Federal requirements for HOV facilities (Title 23 US Code § 166), public authorities (in the case of I-66, VDOT) are responsible for the operation of HOV facilities. Public authorities are required to continuously monitor, assess and evaluate HOV facilities, and demonstrate that the lanes maintain a minimum average operating speed standard. As provided in the US Code, the operation of an HOV facility shall be considered to be “degraded” if vehicles operating on the facility fail to maintain a minimum average operating speed of 45 miles per hour (if the HOV facility has a speed limit of 50 miles per hour or greater) for 90 percent of the time over a consecutive 180-day period, during morning or evening weekday peak hour periods (or both).

Under the current HOV-2 restrictions, traffic on the concurrent HOV facilities of I-66 outside of the Beltway is operating below the Federal requirements. In excerpts of Virginia’s first quarterly update of the HOV Hybrid Vehicle Exemption Certification provided to Federal Highway Administration (FHWA) by VDOT on August 17, 2015, for a 180 day period ending on March 31, 2015, the average operating speed on eastbound I-66 was less than 45 mph 12 percent of the time during the AM peak period. In the westbound direction, during the PM peak period, the requirements were not met 32 percent of the time. Therefore, additional mitigation is required to improve the operations of the existing HOV facilities to meet the FHWA operational requirements.

As stated in the US Code, VDOT is required to bring the facility into compliance with the minimum average operating speed requirement through changes to the operation of the facility. Certain mitigation measures have been suggested within the US Code including:

   a) Increasing the occupancy requirement for HOV lanes;
   b) Varying tolls charged to vehicles allowed under subsection (b) to reduce demand;
   c) Discontinuing allowing non-HOV vehicles to use HOV lanes under subsection (b); or
   d) Increasing the available capacity of the HOV facility.

Subsection (b) refers to vehicle exceptions to the use of the HOV facility.
For the mitigation alternatives described within the US Code, the following steps may be applicable:

a) Increasing enforcement to reduce the number of SOVs using the HOV lane;

b) Changing the restriction from HOV-2 to HOV-3; and

c) Increasing the capacity of the HOV facility or introducing Express Lanes.

Enhanced law enforcement was conducted on I-66 HOV facilities in June 2013 and June 2014 with only limited improvements achieved. After the commencement of the enhanced enforcement periods, I-66 HOV facilities continued to remain in a degraded condition.

The I-66 Outside the Beltway Tier 2 Environmental Assessment (EA) traffic analysis results, as presented at the October 2015 public meetings for the Transform 66 Corridor Improvements Project, showed that by changing from HOV-2 to HOV-3 on I-66 outside the Beltway, the average operating speed in the I-66 HOV lanes (eastbound in the AM peak period and westbound in the PM peak period) could meet the Title 23 US Code § 166 requirements by 2025. The traffic modeling analysis results also showed that speeds would similarly increase on the General Purpose lanes, in the corresponding peak directions, for both peak period by 2025.

While changing the vehicle occupancy requirements from HOV-2 to HOV-3 would produce operational benefits, the HOV-3 operations would still be projected to operate at less than the 45 mph during the morning peak period, and the entire corridor would still be heavily congested. This would likely be a result of vehicles moving into and out of the HOV lane (i.e., HOV vehicles weaving from right to left coming from interchanges, and non-HOV vehicles (violators) exiting the lanes when approaching enforcement areas), and may increase the risk of crashes due to the number of lane changes to and from the HOV lane.

Future traffic forecasts indicate that neither HOV-2 nor HOV-3 restrictions alone, on a single concurrent HOV lane, will completely accommodate projected traffic demands. To serve future traffic volumes and ease congestion along the I-66 corridor, VDOT has identified a Preferred Alternative in the Tier 2 EA that would provide three General Purpose (GP) lanes and two Express Lanes, physically separated from the GP lanes, from Haymarket to the I-495. The proposed High Occupancy Toll lanes (HOT-3) project would be complemented by additional capacity and safety spot improvements, and a dynamic tolling system that would toll Single Occupant Vehicles (SOVs) and vehicles with two occupants (HOV-2) at all times. Vehicles with three or more occupants and transit vehicles would be permitted to use the Express Lanes without being charged a toll.

Results from the Tier 2 EA traffic analysis show that speeds and travel times on the I-66 GP lanes are projected to improve for the Preferred Alternative compared to speeds and travel times with a single concurrent HOV-3 lane in each direction. Furthermore, congestion associated with the GP lanes is projected to decrease as some drivers would chose to use the Express Lanes rather than the GP lanes because those drivers will have the option to pay the toll to travel on the more reliable Express Lanes.

These plans for conversion of the HOV system are consistent with a region-wide conversion proposed in the Financially Constrained Long Range Transportation Plan (CLRP) for the National Capital Region, as adopted in October 2015 by the Transportation Planning Board (TPB). It also complies with the Degradation Mitigation Plan submitted on August 2013 to the FHWA for this section of I-66.

The Code of Virginia 33.1-46.2 identified several conditions, ranging from political processes and public involvement requirements to traffic operational conditions that must be met in order for the HOV designation on I-66 to be changed from HOV-2 to HOV-3. These include the following:

a) Is changing the HOV-2 designation to HOV-3 in the public interest?

b) Is there quantitative and qualitative evidence that supports the argument that HOV-3 will facilitate the flow of traffic on Interstate Route 66?

c) Is changing the HOV-2 designation beneficial to comply with the federal Clean Air Act Amendments of 1990?
Implementing HOT-3 express lanes would improve the travel times on both the HOV and GP lanes on I-66 outside the Beltway. The benefits would be in the public interest and will facilitate the flow of traffic on I-66 by reducing travel times, increasing speeds in congested areas, and reducing the density of vehicles in the I-66 HOV facilities. The implementation of HOV-3 would reduce the number of vehicle miles traveled in the I-66 corridor by 3% per day compared to HOV-2, resulting in an improvement in air quality. This will aid in complying with the Federal Clean Air Act Amendments of 1990. It should be noted that legislation (Chapter 699, HB 407) enacted during the 2016 General Assembly, effective July 1, 2017, stipulates that “the HOV-2 designation of Interstate 66 shall not be changed to HOV-3 or any more restrictive designation.” This legislation expires on January 1, 2020 and therefore, the proposed changes on I-66 outside the Beltway, in the form of modifications to HOV occupancy policy, or implementation the Express Lanes project with HOT-3, would go into effect after the expiration of this law.
INTRODUCTION

The purpose of this report is to summarize the operational characteristics of I-66 outside the Capital Beltway (I-495), and to address mitigation measures to improve the operation on the High Occupancy Vehicle (HOV) lanes. The existing HOV facilities on I-66 perform poorly today, which affects the reliability and effectiveness of the system. As outlined in Title 23 US Code § 166, HOV facilities are required to maintain a certain operational speed performance requirement. This requirement has been assessed for the corridor and compared with existing traffic operations on I-66 based on available traffic data. Because traffic operational conditions on I-66 outside the Beltway fail to meet the Federal requirements for HOV facilities, specific mitigation strategies have been evaluated to determine their effectiveness for addressing the performance issues on the I-66 HOV system. The proposed mitigation strategies were evaluated using available data and previous studies of the corridor or regional HOV system.

Because a change in the HOV designation is listed as one of the mitigation alternatives to improve operations of the HOV lanes and comply with Federal requirements, the procedural steps for introducing such change in designation were also reviewed. Additionally, based on the Code of Virginia (33.1 - 46.2), several conditions must be met in order for the HOV eligibility requirement to be changed from HOV-2 (2 or more persons in the same vehicle) to HOV-3 (3 or more persons in the same vehicle) on I-66 outside the Beltway. This report addresses each of the conditions outlined in the Code of Virginia, as well as other federal laws and requirements, relating to HOV occupancy. Finally, Washington area transportation plans have been reviewed to establish that the proposed alternatives are in line with the latest Financially Constrained Long Range Transportation Plan (CLRP) adopted by the National Capital Region Transportation Planning Board (TPB) and the Degradation Mitigation Plan.

STUDY AREA

The focus of this report is on I-66 outside the Capital Beltway. The limits of the study corridor extend from US Route 29 at Gainesville to I-495. Currently, between US Route 29 at Exit 43 (Gainesville) and I-495, the left-most of the four lanes on eastbound I-66 is restricted to HOV-2 traffic during the AM peak period, from 5:30 to 9:30 AM. Conversely, the left-most lane in the westbound direction of I-66 is restricted to HOV-2 during the PM peak period from 3:00 to 7:00 PM. There is a construction project currently underway to widen I-66 to three General Purpose lanes and one HOV lane in each direction between US Route 29 at Gainesville and the US 15 interchange in Haymarket. This project is expected to be completed by VDOT in August, 2016. An overview of the study area for I-66 outside the Beltway is presented in Figure 1.
FEDERAL LAWS AND REQUIREMENTS

This section presents the Federal regulations on the implementation, maintenance, and operation of High Occupancy Vehicle (HOV) facilities.

The United States Code (USC) addresses the Federal designation, regulation, and suggestions on highway related topics under Title 23. Under Title 23 US Code § 166, Chapter 1 (Federal-Aid Highways) addresses the Federal regulations on HOV / HOT facility definition, management, operation, monitoring, and enforcement. The relevant amendments introduced to US Code Title 23 since 2005 are following:

(1) SAFETEA-LU
The Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed into law on August 10, 2005. Section 1121 of SAFETEA-LU addresses the legal issues germane to HOV facilities.

(2) MAP-21
The Moving Ahead for Progress in the 21st Century Act (MAP-21) was signed into law on July 6, 2012. Section 1514 of MAP-21 addresses HOV facilities and the amendments to 23 USC § 166.

(3) FAST ACT
The most recent Federal Law on surface transportation is the Fixing America’s Surface Transportation Act or FAST Act. It was signed into law on December 4, 2015. Section 1411 of the law addresses HOV facilities, and presents the amendments to be brought into 23 USC § 166.

Occupancy Requirements of the HOV Facility

According to the § 166 (a) (1) of Title 23 USC, a public authority (the designated state transportation agency in the case of the Commonwealth Virginia) that has control over the operation of the HOV facility establishes the occupancy requirements of vehicles operating on the facility. The public authority may allow vehicles to access the facility that do not meet the occupancy criteria an exemption by charging a toll on the vehicle. In addition to tolling vehicles, the public authority overseeing the HOV facility may also allow public transportation and hybrid vehicles to use the facility toll-free. The existing I-66 HOV lanes are currently managed by VDOT, which has the authority over the occupancy requirements for I-66 outside the Beltway.

HOV Facility Management

According to § 166 (d) (1), if the HOV facility is being used by either single occupancy vehicles (SOV) paying a toll, or by hybrids, the public authority needs to submit a report to the Federal Highway Administration (FHWA) demonstrating that the HOV facility is not degraded, and that the presence of the vehicles will not deteriorate the performance of the facility in the future. In addition to these requirements, the public authority managing the facility will also annually submit reports on the operations of the facility. Federal regulation also outlines that the authority should establish, manage, and support a program which monitors, evaluates, and reports on the performance of the HOV facility. § 166 (d) (1) (B) also suggests that the public authority establish an enforcement program that ensures the facility is being operated according to the federal requirements.

HOV Facility Minimum Average Operating Speed

The minimum average operating speed of a HOV facility according to Federal regulations should be 45 miles per hour, in the case of an HOV facility with a speed limit of 50 miles per hour or greater. If the speed limit of the HOV facility is less than 50 miles per hour, then the minimum average operating speed should not be more than 10 miles per hour below the posted speed limit.

Degraded HOV Facility

According to § 166 (d) (2), the operation of a HOV facility is considered to be degraded if vehicles operating on the facility fail to maintain the minimum average operating speed (45 miles per hour) 90 percent of the time over a consecutive 180-day period during morning or evening weekday peak hour periods or both.

In terms of gathering data on minimum average operating speed, the FHWA does not require use of a specific procedure or methodology by the state public authority if the operational performance of the HOV facility is degraded, as each HOV facility has different characteristics and each public authority has different resources to gather and analyze data. The data collection points along the facility can be spaced uniformly at equal distance apart from each other or at strategic locations.

Maintenance of Operating Performance

In order to maintain the minimum average operating speed for HOV facilities, § 166 (d) (1) (D), identifies the following possible measures to be undertaken:

(a) Increasing the occupancy requirement of the HOV lanes
(b) Varying the toll charged to vehicles allowed in order to reduce demand
(c) Discontinuing allowing non-HOV vehicles to use HOV lanes
(d) Increasing the available capacity of the HOV facility

A Degradation Mitigation Plan should be developed by the public authority and submitted to the FHWA to address how the minimum average operating speed will be achieved. Within 60 days of the submission of
the plan, the US Secretary of Transportation shall provide an approval or disapproval notice to the public authority based on a determination that if the plan is likely to make progress toward bringing the HOV facility into compliance with the minimum average operating speed standard. The public authority must submit an annual progress report to the Secretary as long as the performance of the HOV facility is not brought back to the minimum average operating speed, according to § 166 (d) (1) (D) (iii). The progress reports should describe the steps taken by the authority to bring the HOV facility into compliance with the Federal standard as well as the progress made by those steps.

I-66 HOV FACILITY COMPLIANCE WITH FEDERAL LAW

As mentioned in the previous section on the Federal laws and operational requirements, the public authority (VDOT) should regularly report on the operation of the I-66 HOV lanes to make sure that they comply with the Federal requirements and the facilities are not degraded. Federal law provides the following definition for degraded facilities:

“The operation of a HOV facility shall be considered to be degraded if vehicles operating on the facility are failing to maintain a minimum average operating speed 90 percent of the time over a consecutive 180-day period during morning or evening weekday peak hour periods (or both)”

As mentioned in § 166 (d) (2) (A):

- **d (2) (A) Definition of minimum average operating speed** — In this paragraph, the term “minimum average operating speed” means

- (i) 45 miles per hour, in the case of a HOV facility with a speed limit of 50 miles per hour or greater; and

- (ii) Not more than 10 miles per hour below the speed limit, in the case of a HOV facility with a speed limit of less than 50 miles per hour.

Thus, to evaluate the operation of the current HOV facility, this condition for maintaining minimum average operation speed was considered. In excerpts of Virginia’s first quarterly update of the HOV Hybrid Vehicle Exemption Certification provided to FHWA by VDOT on August 17, 2015, for a 180-day period ending on March 31, 2015, the average operating speed on eastbound I-66 was less than 45 mph 12% of the time during the AM peak period. In the westbound direction during the PM peak period, the requirements are not met 32% of the time on the corridor.

**Figure 2** shows the changes in travel times from 1996 to 2014 on the eastbound HOV lane on I-66 outside the Beltway during the AM peak period. The AM peak period HOV restriction, between 5:30 AM and 9:30 AM, was the same for all years. For the purpose of data collection, the travel time surveys were conducted from 5:00 AM to 10:00 AM for each year. The figure shows that the performance of the HOV lane is deteriorating, with travel times on I-66 outside the Beltway getting progressively worse over the 18-year period. It should be noted that these travel times do not represent year-round data, and they only provide a snapshot of the travel times for the date they were collected. But based on the data available, the graphic below presents a consistent general trend of decreasing travel speeds and increasing travel times on eastbound I-66 outside the Beltway during the AM peak period. Similar observations have been made for the westbound direction of I-66 in the afternoon peak, but the data sets available were incomplete for several of the years for which eastbound data was provided.
The Metropolitan Washington Council of Governments (MWCOG) releases a report every three years that documents the level of congestion in terms of relative speed, density, and approximate queue length for each interstate or freeway in the Washington metropolitan area. The Traffic Quality on the Metropolitan Washington Area Freeway System Report, prepared for MWCOG by Skycomp, uses aerial photography surveys to capture traffic operating conditions during the morning and afternoon peak periods.

During the survey flights, overlapping photographic coverage was obtained of each interstate highway or freeway in the region, repeated once an hour over three separate morning and evening commute periods, resulting in 9 morning and 9 evening observations of each highway segment. The times of coverage for the morning were 6:00-9:00 AM outside the Beltway and 6:30-9:30 AM inside the Beltway. The evening times were 4:00-7:00 PM inside the Capital Beltway and 4:30-7:30 PM outside the Beltway. Survey flights were conducted on weekdays, excluding Monday mornings, Friday evenings and mornings after holidays.

During the AM peak period for the most recent survey in 2014, the concurrent eastbound HOV-2 lane outside the Beltway was congested throughout nearly the entire segment from the Virginia Route 234 Bypass to I-495. Congestion levels on eastbound I-66 during the AM peak hour (7:00 AM to 8:00 AM) for 2008, 2011 and 2014 are summarized in Figure 3 below. The results show that the congestion levels are increasing on I-66 and the queues are propagating over the length of the entire study area corridor. The MWCOG report noted that congestion levels in 2014 were observed to be a result of weaving and friction between the HOV lanes and the adjacent, congested General Purpose (GP) lanes, as well as traffic entering the eastbound HOV lane in the morning from the Monument Drive HOV ramp.
During the PM peak period, the concurrent westbound HOV-2 lane outside the Beltway was congested throughout nearly the entire segment from I-495 to Virginia Route 234 Business (Sudley Road). The congestion levels on westbound I-66 during the PM peak hour (5:30 PM to 6:30 PM) for 2008, 2011 and 2014 are summarized in Figure 4 below.
DEFINITION AND EVALUATION OF MITIGATION ALTERNATIVES

This section discusses the proposed mitigation alternatives that are possible to improve operations of the HOV lanes on I-66 outside the Beltway. The effectiveness of each alternative was evaluated based on existing data, previous HOV studies, and study results from the I-66 outside the Beltway Tier 2 EA.

Definition of Alternatives

Three potential mitigation strategies that could be implemented to improve operations of the I-66 HOV facilities outside the Beltway were evaluated:

   a) Increase enforcement to reduce the number of SOVs using the HOV lane;
   b) Change the restriction from HOV-2 to HOV-3;
   c) Increase capacity on the HOV facility and use of tolling strategies.

The effectiveness of an increased enforcement alternative was assessed using previous reports of previous enforcement experience. Evaluation of the other mitigation alternatives was based on the Tier 2
EA traffic analysis results presented at the October 2015 public meetings for the Transform 66 Corridor Improvement Project. In the Tier 2 EA traffic analysis, the following alternatives were tested:

1. **Existing Conditions (2014):** The existing condition includes the HOV-2 restriction on I-66 outside the Beltway. Single occupancy vehicles are not allowed to use the concurrent HOV lane during peak periods unless they are qualifying hybrid vehicles with appropriate registered license plates, or federal law enforcement officials.

2. **No-Build Conditions (2025):** The 2025 No-Build condition entails the change to a HOV-3 restriction on the concurrent HOV lane. The use of the HOV lane is prohibited for single occupancy vehicles as well as for vehicles with two occupants in the eastbound direction during AM peak period and the westbound direction during PM peak period. No hybrid vehicles are permitted under this scenario.

3. **Transform 66 Outside the Beltway Build Conditions (2025):** The Build conditions include a conversion to a High Occupancy Toll system with HOT-3 restrictions in place, where all vehicles with one or two passengers are able to pay the toll to use the Express Lanes at all times. Vehicles with three or more passengers may use the Express Lanes without paying a toll. As proposed in the Tier 2 Preferred Alternative, there would be two Express Lanes and three General Purpose lanes in each direction. The improvements proposed in Tier 2 EA Phase 1 of the Preferred Alternative are assumed in the network in 2025.

**Evaluation of Alternatives**

In this section, the performance of each of the alternatives is summarized. The evaluation is based on the Tier 2 EA traffic model run results, available data, and previous implementation experiences.

The effectiveness of the increased enforcement strategy is limited. An example of the effects of enforcement can be obtained from previous efforts conducted on both the inside and outside the Beltway HOV lanes. As discussed in excerpts of Virginia’s first quarterly update of the HOV Hybrid Vehicle Exemption Certification provided to FHWA by VDOT on August 17, 2015, enhanced law enforcement efforts were implemented on I-66 HOV facilities in June 2013 and June 2014. On June 19, 2014, 385 offenses were recorded, of which 377 were first time offenses, 7 were second time offenders, and 1 third time offender. An analysis of before and after data for the 2014 effort revealed that there were some short-term improvements in reducing degradation. On I-66 WB, the degradation rate decreased from 35% to 21% of the time upon concluding the effort. While an improvement was noted, the amount of continued HOV facilities degradation still exceeds the criteria of a maximum rate of 10% of the time. Based on both previous experiences, enhanced enforcement can be seen as a moderately effective measure; however, it cannot be used as the only measure for mitigation. Moreover, due to the additional expense of increased patrols on I-66, as well as the unintended residual congestion resulting from vehicles slowing because the presence of police vehicles, additional full-time enforcement may not be feasible.

The evaluation of HOV-3 and HOT-3 alternative strategies in this report is based upon the results of the Tier 2 EA traffic analysis results presented at the October 2015 public meetings for the Transform 66 Corridor Improvement Project. As documented in the CLRP, the National Capital Region TPB has maintained a policy since 2010 of increasing the occupancy requirements on all HOV facilities in the region, including those on I-66 outside the Beltway, from HOV-2 to HOV-3 by 2020. Additional sensitivity analyses have been conducted to determine the travel speeds on both the HOV and GP lanes of I-66 outside the Beltway due to the conversion of the HOV requirement to HOV-3. It is important to note that a 2020 HOV scenario, where I-66 outside the Beltway will operate solely as an HOV-3, facility is a hypothetical situation, since the procurement I-66 Express Lanes project is under procurement and now advancing through the project development stages.

The calculated travel speeds derived for the future 2020 HOV-2 and HOV-3 scenarios are theoretical in nature, and based on several assumptions and the best data available from the MWCOG. The assumptions employed include removal of hybrid vehicles from the HOV lanes under any HOV-3
scenario, and that traffic trends on the I-66 corridor would generally continue in a similar linear fashion based on data from previous years. For the purposes of trend analysis and data extrapolation, MWCOG’s *Performance of High Occupancy Vehicle Facilities on Freeways in the Washington Region* Report data was used from 2004, 2007, and 2010. These years were selected because they included both AM and PM travel time data available from the MWCOG reports.

The 2020 calculated speeds, which were also extrapolated using travel times for I-66 outside the Beltway in 1997 and 1999, were estimated by using best available recent travel time data cited in MWCOG’s 2010 HOV report. The travel times for I-66 outside the Beltway were obtained by deducting the travel time for the inside the Belway from the total travel time on I-66 (between Route 234 Business to the Theodore Roosevelt Bridge). For this study, travel times for the portion inside the Beltway (between I-495 and the Theodore Roosevelt Bridge) were not available for 1997 and 1999. As such, 2004 travel times were used as a basis to extrapolate estimates for the travel times on I-66 inside the Beltway for years 1997 and 1999, under the assumption that peak hour travel times and traffic flow during the HOV restriction period on I-66 inside the Beltway have been generally consistent over the years.

*Figure 5* and *Figure 6* show the actual peak direction travel speeds from the MWCOG reports for the HOV lane and GP lanes on I-66 outside the Beltway for the AM and PM peak periods, respectively. Also shown in these figures are the general trend lines of travel speeds on the HOV and GP lanes during the AM and PM peak periods, which were used in calculating future travel times. Based on the historical data trend lines, the travel speeds were derived for 2020 and 2025 for the HOV-2 condition. As shown below, based on the travel time trend lines, the travel speeds on the HOV lane and GP lanes during the AM peak period are projected to be 14 mph and 13 mph, respectively. During the 2025 PM peak period, travel speeds are projected to be 22 mph on the HOV lane and 18 mph on the GP lane. The travel speeds for 2020 are projected to be 17 mph and 15 mph during the AM peak period in the HOV lane and GP lanes, respectively. During the PM peak period, the travel times are expected to be 29 mph on the HOV lane and 21 mph on the GP lanes.

![Figure 5 - Travel Speed Trends (I-66 Outside the Beltway, AM Peak Period)](image_url)
The Revised Tier 2 EA Transportation Technical Report provided results for 2025 and 2040 in which I-66 outside the Beltway is operating as an HOV-3 facility under the “No-Build” conditions. The 2020 travel speeds on I-66 outside the Beltway under an HOV-3 restriction were estimated by assuming that travel speed trends shown between 2025 and 2040 results in the Revised Tier 2 EA traffic analysis will be consistent and linear starting from 2020. A final assumption used in the calculation of 2020 travel times on I-66 outside the Beltway is that the HOV-2 scenario includes hybrid vehicles in the HOV lanes; whereas the HOV-3 scenario does not allow hybrid vehicles to use the HOV lanes.

The results of the analysis are summarized in Figure 7 and Figure 8 for the AM eastbound and PM westbound peak hours, respectively. As shown in the figures below, travel speeds in both the HOV lanes and GP lanes will decrease significantly between the 2014 and 2020 HOV-2 scenarios. When comparing the travel speeds associated with the 2020 HOV-2 and 2020 HOV-3 scenarios, a marginal decrease is expected in the GP lanes as result of the HOV conversion. This decrease can be attributed to an increase in SOV volume or HOV-2 volume on the GP lanes, due to the increased difficulty in forming HOV-3 carpools from original HOV-2 carpools. The subsequent drop in volume in the HOV lane, due to the HOV-3 requirement, results in an increase in travel speeds in the HOV lanes in 2020.

When comparing travel speeds between 2020 and 2025 for the HOV-3 scenario, it is expected that there will be a gradual change in car-pooling habits over time, as drivers begin to accept the benefits of travel in the HOV lanes in a three-person carpool under the modified restrictions. The ramp-up time for formation of these carpools, in order to gain access into the HOV lane, was estimated to be approximately five years. This would correspond with the time it would take for additional car-pooling incentives to be developed under a corridor Transportation Management Plan, or for other Travel Demand Management (TDM) strategies to be implemented for the corridor. These strategies could include specialized programs to incentivize ride sharing, van-pooling, transit service improvements (increased bus frequency), and “hot-spot” transportation network improvements, regardless whether the I-66 outside the Beltway Express
Lanes project was built. In addition, planned roadway capacity improvements identified in the CLRP on parallel facilities (such as US 29, US 50), and on the Fairfax County Parkway and VA Route 28, would aid in removing some trips from the I-66 GP lanes. By reducing volume demands on the GP lanes, travel speeds would improve. As shown in Figure 7 and Figure 8 the speeds in both directions on the Express Lanes in the HOT-3 alternative will meet the Federal requirements of 45 miles per hour.

Figure 9 shows the speeds on the HOV Lane or Express Lanes in each segment of I-66 outside the Beltway in the eastbound direction. The only section that experiences speeds below 45 mph in the HOT-3 alternative is the segment between VA Route 28 and US 50. The remaining eastbound segments are expected to experience speeds greater than 45 mph in the HOT-3 alternative. The figure shows that even under the HOT-3 restriction, there will still be some congestion on the HOV lane that would be resolved by implementing HOT-3 as part of the Transform 66 Outside the Beltway project Phase 1 of the Preferred Alternative.

Figure 10 similarly shows the speeds on the westbound HOV Lane or Express Lanes on each segment of I-66 outside the Beltway. Under the HOV-3 designation, the speeds in the HOV lane are only lower than 45 mph in the section between I-495 and VA Route 243 (Nutley Street). As in the eastbound direction, all speeds are higher than 45 mph in the westbound direction with the HOT-3 conditions associated with Phase 1 of the Preferred Alternative.

Because the implementation of the Transform 66 Outside the Beltway project includes interchange and interstate mainline capacity improvements in conjunction with tolling of non-HOV-3 vehicles, the conversion from HOV-2 to HOV-3 would be the only possible non-toll mitigation strategy to consider regarding the mitigation of I-66 HOV degradation.
Figure 8 - Travel Speeds on Westbound I-66 Outside the Beltway Under Different Mitigation Strategies in PM Peak Hour

Source: Tier 2 Environmental Assessment Transportation Technical Report Results
Figure 9 - Travel Speed on Eastbound I-66 Outside the Beltway Under Different Mitigation Strategies for each Segment in AM Peak Hour

Source: Tier 2 Environmental Assessment Transportation Technical Report Results, 2015
Figure 10 - Travel Speed on Westbound I-66 Outside the Beltway Under Different Mitigation Strategies for each Segment in PM Peak Hour

Source: Tier 2 Environmental Assessment Transportation Technical Report Results, 2015
CONDITIONS IN THE CODE OF VIRGINIA

The Code of Virginia (Section 33.2-501)\(^2\) identifies several conditions, ranging from political processes and public involvement requirements to traffic operational conditions that must be met, in order for the HOV designation on I-66 to be changed from HOV-2 to HOV-3. These conditions are summarized below:

\[ F. \text{ Notwithstanding the contrary provisions of this section, the following conditions shall be met before the HOV-2 designation of Interstate Route 66 outside the Capital Beltway can be changed to HOV-3 or any more restrictive designation:} \]

1. The Department shall publish a notice of its intent to change the existing designation and also immediately provide similar notice of its intent to all members of the General Assembly representing districts that touch or are directly impacted by traffic on Interstate Route 66.

2. The Department shall hold public hearings in the corridor to receive comments from the public.

3. The Department shall make a finding of the need for a change in such designation, based on public hearings and its internal data and present this finding to the Commonwealth Transportation Board for approval.

4. The Commonwealth Transportation Board shall make written findings and a decision based upon the following criteria:
   
   a. Is changing the HOV-2 designation to HOV-3 in the public interest?
   
   b. Is there quantitative and qualitative evidence that supports the argument that HOV-3 will facilitate the flow of traffic on Interstate Route 66?
   
   c. Is changing the HOV-2 designation beneficial to comply with the federal Clean Air Act Amendments of 1990?

It should be noted that legislation (Chapter 699, HB 407) enacted during the 2016 General Assembly, effective July 1, 2017, stipulates that “the HOV-2 designation of Interstate 66 shall not be changed to HOV-3 or any more restrictive designation.” This legislation expires on January 1, 2020. The current procurement and construction schedule calls for the project to be completed by the end of 2020, with implementation of an HOV-3 conversion occurring simultaneously with the onset of operations as HOT lanes – upon issuance by VDOT of a “Service Commencement Notice to Proceed” for the new I-66 Express Lanes, and consistent with HB 407. The following sections address each of the above conditions individually, through actions of VDOT or through documented resources that support the change in HOV designation.

\(^2\) [http://lis.virginia.gov/000/hb311c.pdf](http://lis.virginia.gov/000/hb311c.pdf)
Notice of Intent to Change Existing Designation

1. The Department shall publish a notice of its intent to change the existing designation and also immediately provide similar notice of its intent to all members of the General Assembly representing districts that touch or are directly impacted by traffic on Interstate Route 66.

It is the intent of the Department (VDOT) to change the occupancy restriction along I-66 outside of the Capital Beltway from HOV-2 to HOV-3. This policy change is planned to take place no earlier than January 2, 2020 and no later than the opening of the Express Lanes project currently under development.

VDOT published a notice of intent related to the proposed HOV designation change in a number of newspapers in the region on April 20, 21, 22, and 27, 2016 and on May 5 and 6, 2016. On April 22, 2016, VDOT mailed a notice of its intent to change the existing HOV-2 designation to HOV-3 to all members of the General Assembly representing districts that touch or are directly impacted by traffic on I-66. The following districts were notified:

**Senate Districts:**
- Richard H. Stuart, District 28
- Jeremy S. McPike, District 29
- Adam P. Ebbin, District 30
- Barbara A. Favola District 31
- Janet D. Howell, District 32
- Jennifer T. Wexton, District 33
- J. Chapman Petersen, District 34
- Richard L. Saslaw, Senate Minority Leader, District 35
- Scott A. Surovell, District 36
- David W. Marsden, District 37
- George L. Barker, District 39

**House of Delegates Districts:**
- Robert G. Marshall, County of Prince William (part); City of Manassas Park, 13th District
- Mark L. Keam, County of Fairfax (part), 35th District
- David L. Bulova, County of Fairfax (part); City of Fairfax, 37th District
- Timothy D. Hugo, Majority Caucus Chairman, Counties of Fairfax (part) and Prince William (part), 40th District
- Patrick A. Hope, County of Arlington (part), 47th District
- Richard C. (Rip) Sullivan Jr., Minority Caucus Campaign Chairman, Counties of Arlington (part) and Fairfax (part), 48th District
- Alfonso H. Lopez, Minority Whip, Counties of Arlington (part) and Fairfax (part), 49th District
- Jackson H. Miller, Majority Whip, County of Prince William (part); City of Manassas, 50th District
- Richard L. Anderson, County of Prince William (part), 51st District
- Marcus B. Simon, County of Fairfax (part); City of Falls Church, 53rd District
- James M. LeMunyon, Counties of Fairfax (part) and Loudoun (part), 67th District
- John J. Bell, Counties of Loudoun (part) and Prince William (part), 87th District

The following elected officials from other non-adjacent districts were also notified:

**United States Senate:**
- Mark Warner, Virginia
- Tim Kaine, Virginia
United States House of Representatives:

- Robert Wittman, 1st Congressional District
- Don Beyer, 8th Congressional District
- Barbara Comstock, 10th Congressional District
- Gerald Connolly, 11th Congressional District

Other Virginia Senate Districts:

- Richard H. Black, District 13
- Mark D. Obenshain, District 26
- Jill Holtzman Vogel, District 27

Other Virginia House of Delegates Districts:

- Mark L. Dudenhefer, 2nd District
- J. Randall Minchew, 10th District
- C. Todd Gilbert, 15th District
- Michael J. Webert, 18th District
- Christopher E. Collins, 29th District
- L. Scott Lingamfelter, 31st District
- Thomas A. Greason, 32nd District
- David A. LaRock, 33rd District
- Kathleen J. Murphy, 34th District
- Kenneth R. Plum, 36th District
- Kaye Kory, 38th District
- Vivian E. Watts, 39th District
- Eileen Filler-Corn, 41st District
- David B. Albo, 42nd District
- Mark D. Sickles, 43rd District
- Paul E. Krizek, 44th District
- Mark H. Levine, 45th District
- Charniele L. Herring, 46th District
- Jennifer B. Boysko, 86th District

County Executives, County/City Managers, and County/City/Town Clerks:

- Sharon Bulova, Chairman, Fairfax County Board of Supervisors
- Linda Q. Smyth, Fairfax County Board of Supervisors
- John C. Cook, Fairfax County Board of Supervisors
- Pat Herrity, Fairfax County Board of Supervisors
- Kathy L. Smith, Fairfax County Board of Supervisors
- John W. Foust, Fairfax County Board of Supervisors
- Jeff C. McKay, Fairfax County Board of Supervisors
- Catherine M. Hudgins, Fairfax County Board of Supervisors
- Daniel G. Storck, Fairfax County Board of Supervisors
- Penelope A. Gross, Fairfax County Board of Supervisors
- Edward L. Long, Jr., County Executive, Fairfax County
- Catherine A. Chianese, Clerk, Fairfax County Board of Supervisors
- Corey A. Stewart, Chairman, Prince William County Board of Supervisors
- Jeanine M. Lawson, Prince William County Board of Supervisors
- Pete Candland, Vice Chair, Prince William County Board of Supervisors
- Martin E. Nohe, Prince William County Board of Supervisors
- John D. Jenkins, Prince William County Board of Supervisors
- Ruth M. Anderson, Prince William County Board of Supervisors
- Maureen S. Caddigan, Prince William County Board of Supervisors
• Frank J. Principi, Prince William County Board of Supervisors
• Christopher E. Martino, County Executive, Prince William County
• Phillip Campbell, Clerk, Prince William County Board of Supervisors
• R. Scott Silverthorne, Mayor, Fairfax City Council
• Michael J. DeMarco, Fairfax City Council
• Jeffrey C. Greenfield, Fairfax City Council
• Nancy F. Loftus, Fairfax City Council
• David L. Meyer, Fairfax City Council
• Janice B. Miller, Fairfax City Council
• Eleanor D. Schmidt, Fairfax City Council
• Bob Sisson, City Manager, City of Fairfax
• Melanie Burrell, Clerk, City of Fairfax
• Laurie A. DiRocco, Mayor, Vienna Town Council
• Edythe Frankel Kelleher, Vienna Town Council
• Carey J. Sienicki, Vienna Town Council
• Howard J. Springsteen, Vienna Town Council
• Tara Voigt, Vienna Town Council
• Linda Jane Colbert, Vienna Town Council
• Pasha M. Majdi, Vienna Town Council
• Mercury Payton, Town Manager, Town of Vienna
• Melanie Clark, Clerk, Town of Vienna
• David M. Leake, Mayor, Haymarket Town Council
• Steve Aitken, Vice Mayor, Haymarket Town Council
• Joe Pasanello, Haymarket Town Council
• Chris Morris, Haymarket Town Council
• Matt Caudle, Haymarket Town Council
• Pamela Swinford, Haymarket Town Council
• Kurt Woods, Haymarket Town Council
• Brian Henshaw, Town Manager, Town of Haymarket
• Jennifer Preli, Clerk, Town of Haymarket
• Harry J. Parrish II, Mayor, Manassas City Council
• Sheryl L. Bass, Manassas City Council
• Ken D. Elston, Manassas City Council
• Marc T. Aveni, Manassas City Council
• Mark D. Wolfe, Manassas City Council
• Johnathan L. Way, Vice Mayor, Manassas City Council
• Ian Lovejoy, Manassas City Council
• William Patrick Pate, City Manager, City of Manassas
• Andrea Madden, Clerk, City of Manassas
• Frank Jones, Mayor, Manassas Park City Council
• Bryan E. Polk, Vice Mayor, Manassas Park City Council
• Keith Miller, Manassas Park City Council
• Suhas Naddoni, Manassas Park City Council
• Michael Carrera, Manassas Park City Council
• Preston Banks, Manassas Park City Council
• Jeanette Rishell, Manassas Park City Council
• Kimberly L. Alexander, City Manager, City of Manassas Park
• Lana Conner, Clerk, City of Manassas Park
Public Hearings

2. The Department shall hold public hearings in the corridor to receive comments from the public.

Pursuant to the condition outlined above, VDOT and the Department of Rail and Public Transportation (DRPT) held three public hearings regarding the proposed HOV designation change at the following locations and times:

- **May 23, 2016 from 6:30 PM to 8:30 PM at the Oakton High School Cafeteria in Vienna, Virginia**
  - Approximately 105 people attended.
  - Elected Officials/Representatives (7):
    - Senator J. Chapman Petersen - 34th District
    - Delegate Jennifer B. Boysko - 86th District
    - Delegate Mark L. Keam - 35th District
    - Delegate Kathleen J. Murphy - 34th District
    - Joe Montano, Manassas Regional Director for Senator Tim Kaine
    - Patricia Leslie, Transportation Aide to Supervisor Linda Q. Smyth
    - Tom Biesiadny, Director, Fairfax County Department of Transportation
  - 10 Speakers, 1 Individual Comment Submitted to Court Reporter and 8 Comment Sheets Submitted

- **May 24, 2016 from 6:30 PM to 8:30 PM at the VDOT Northern Virginia District Office in Fairfax, Virginia**
  - Live streamed at Transform66.org.
  - Approximately 59 people attended (in person; live streaming viewers undetermined).
  - Elected Officials/Representatives (7):
    - Senator David W. Marsden, 37th District
    - Delegate Vivian E. Watts, 39th District
    - Supervisor Kathy Smith, Fairfax County Board of Supervisors, Sully District
    - Joe Montano, Manassas Regional Director for Senator Tim Kaine
    - Anh Pham, Aide to Senator Mark Warner
    - Alex Robbins, Fairfax Outreach Representative for Congressman Gerry Connolly
  - 7 Speakers and 2 Comment Sheets Submitted

- **May 25, 2016 from 6:30 PM to 8:30 PM at the Piney Branch Elementary School Cafeteria/Gym in Bristow, Virginia**
  - Approximately 29 people attended.
  - Elected Officials/Representatives (4):
    - Delegate Robert G. Marshall, 13th District
    - Supervisor Jeanine Lawson, Brentsville District, Prince William County Board of Supervisors
    - Diana Meiser, Aide to Supervisor Pete Candland, Gainesville District, Prince William County Board of Supervisors
    - Karen Ulrich, Aide to Supervisor Jeanine Lawson, Brentsville District, Prince William County Board of Supervisors
  - Media (2)
    - Bull Run Observer
    - Fauquier Times/Prince William Times
  - 5 Speakers and 1 Comment Sheet Submitted.

At the public hearings there were a total of 193 attendees, 22 speakers, and 11 comment sheets were submitted. Comments received to regarding the HOV-2 to HOV-3 (or HOT-3) include:

- Concern about infrastructure support for increased carpooling, such as park and ride lots that provide areas for informal carpools.
- Other support for increasing the occupancy requirement to 3.
Conversion of HOV-2 Designation on I-66 Outside the Capital Beltway to HOV-3

June 2016

Page 20

- Request to consider starting out as HOV-2 and see if HOV-2 could work in the Express Lanes.
- Concern about vehicles that cannot meet the HOV-3 occupancy requirement diverting to the General Purpose lanes or other parallel corridors.
- Support for the conversion in 2020, which has been planned for several years.

Need for Change in HOV Designation

3. The Department shall make a finding of the need for a change in such designation, based on public hearings and its internal data and present this finding to the Commonwealth Transportation Board for approval.

As presented previously, the speed data and past analysis shows that the HOV facility is degraded on I-66 outside the Beltway. In addition, other performance measures, such as travel times and congestion highlighted in this report, confirm the poor operations of HOV lanes and the PG lanes on I-66 outside the Beltway. Public hearing testimony and written comments received to date, regarding the proposed change in HOV restrictions, have been summarized above.

Support for Change in HOV Designation

4. The Commonwealth Transportation Board shall make written findings and a decision based upon the following criteria:

a. Is changing the HOV-2 designation to HOV-3 in the public interest?

b. Is there quantitative and qualitative evidence that supports the argument that HOV-3 will facilitate the flow of traffic on Interstate Route 66?

c. Is changing the HOV-2 designation beneficial to comply with the Federal Clean Air Act Amendments of 1990?

As shown in the previous sections, by changing the HOV eligibility on I-66 outside the Beltway from HOV-2 to HOV-3 average travel times will be reduced and average travel speeds will increase on both the HOV and GP lanes. The implementation of HOV-3 would reduce the number of vehicle miles traveled in the I-66 Outside the Beltway study corridor by 3% per day. A reduction in vehicles miles traveled on the corridor could result in lower vehicular emissions and air quality impacts. These benefits would be in the public interest and comply with the Federal Clean Air Act Amendments.

METROPOLITAN WASHINGTON AREA TRANSPORTATION PLANS FOR HOV

The TPB is the federally designated Metropolitan Planning Organization (MPO) for the region, and plays an important role as the regional forum for transportation planning. The TPB prepares plans and programs that the federal government must approve in order for federal-aid transportation funds to flow to the Washington region. As mentioned in the 2015 CLR for the National Capital Region, the Transform 66 Outside the Beltway project is among the major transportation projects included in the plan.

The January 2008 the TPB adopted a CLR which identified that there was a regional consensus on the intent to institute a region-wide change in interstate HOV policy from HOV-2 to HOV-3. This was reaffirmed in an April 2014 TPB approval for the purpose of the air quality conformity analysis by the year 2020 and beyond. Furthermore, the 2009 I-66 Transit/TDM Study commissioned by the Virginia Department of Rail & Public Transportation (DRPT) acknowledged and accepted this HOV-3 policy assumption and used it as a baseline condition for all of the analysis performed as part of the 2009 study.
Additionally, the 2013 I-66 Multimodal Study (prepared for VDOT and DRPT) acknowledged and accepted this HOV-3 policy assumption as a baseline condition and used it as the basis of all modeling work performed during that study. The Arlington Board of Supervisors and the Northern Virginia Transportation Authority (NVTA) have both gone on record with their support of the CLRP improvements to I-66, including the change from HOV-2 to HOV-3.

In October 2015 the Commonwealth Transportation Board (CTB) approved a preferred design alternative for I-66 outside the Beltway that will consist of two Express HOT (High Occupancy Toll) lanes alongside three general purpose lanes in each direction between I-495 and University Boulevard with plans to extend the project to US 15 in Haymarket. The Express Lanes will operate as HOT-3 Lanes, which requires vehicles with one and two occupants to pay a toll to use the Express Lanes. In December 2015, VDOT announced that the I-66 outside the Beltway project will be privately financed under a partnership between VDOT and the private sector under the Public Private Transportation Act (PPTA). The Code of Virginia (33.2-502) states that “the high-occupancy requirement for a HOT lanes facility constructed or operated as a result of the Public-Private Transportation Act shall not be less than three”. As such, any other HOT occupancy policy that differs from the HOT-3 requirement would be in violation of the Code of Virginia and jeopardizes a project that has been categorized as a statewide high priority project evaluated under House Bill 2 (HB2) and advanced for consideration for funding by the CTB in the update to the 2017-2022 Six-Year Improvement Plan (SYIP).

VDOT DEGRADATION MITIGATION PLAN

As mandated by Federal Law, a Degradation Mitigation Plan has been developed by VDOT to address how the minimum average operating speed will be achieved. On August, 2013 VDOT proposed a five-phase Degradation Mitigation Plan to FHWA. The five phases are:

1. Increase HOV enforcement and public awareness [this mitigation element was initiated in 2013 and continues],
2. Improve available capacity management by implementing Active Traffic Management (ATM) on I-66 [this mitigation element was completed in 2015],
3. Consider managed lanes (as mentioned in the CLRP) [project currently under procurement],
4. Discontinue clean fuel (Non-HOV) vehicle exemption (i.e. hybrids) [this mitigation element to be included as part of the project currently under procurement], and
5. Increase the occupancy requirement from HOV-2 to HOV-3 [this mitigation element to be included as part of the project currently under procurement].

CONCLUSIONS AND RECOMMENDATIONS

The HOV lanes on I-66 outside the Beltway currently experience congestion, inconsistent travel times, and reduced travel speeds that do not meet current Federal standards. Based on the Federal criteria, the HOV lanes on I-66 outside the Beltway are considered to be a “degraded” facility. This report documents that a change in HOV designation, from HOV-2 to HOV-3, would improve the traffic conditions in the HOV lanes. However, simply changing the HOV restrictions on the concurrent lanes from HOV-2 to HOV-3 would not meet the Federal requirements for HOV lanes in the I-66 corridor, so additional mitigation measures would be needed.

The traffic analysis documented in the Tier 2 EA Transportation Technical Report indicates that HOT-3 operations using Express Lanes, which involve capacity expansion and the physical separation of the Express Lanes from the GP lanes, would significantly improve traffic flows and reduce travel times on I-66 outside the Beltway. These plans are consistent with the CLRP for the National Capital Region adopted in 2015 by the TPB. They also comply with VDOT’s Degradation Mitigation Plan submitted on August 2013 to the FHWA for this segment of I-66.