National Capital Region
Transportation Planning Board

MEMORANDUM

TO: Transportation Planning Board

FROM: Cristina Finch, TPB Transportation Planner

SUBJECT: Finalization of Project Inputs for Visualize 2050 Air Quality Conformity Analysis

DATE: July 10, 2025

This memorandum provides an update on the progress of the Visualize 2050 regional transportation plan and the required air quality conformity analysis ahead of scheduled approval of the plan in December 2025. Included with this memo are two attachments:

- Frequently Asked Questions on Visualize 2050 Air Quality Conformity and System Performance Assessment
- Letter from VDOT to MD SHA on June 25, 2025 re: I-495 Southside Express Lanes Study

In May 2024, the TPB approved the draft scope of work for the air quality conformity analysis of Visualize 2050 and the FY 2026-29 Transportation Improvement Program (TIP).[1] This scope of work included assumptions about the analysis years, the land use forecasts (Round 10 Cooperative Forecasts), and assumptions about other inputs, such as the transportation networks, which represent future-year highway and transit network projects that are considered regionally significant for air quality (RSAQ) planning purposes. In June 2024, the TPB approved amending the May transportation project list to add the I-495 Southside Express Lanes (SEL) for the air quality conformity analysis. Following this addition, it was understood that the conformity analysis would be run both with and without the I-495 SEL project to provide additional time for analysis on the project and for members to consider its value to the region's future transportation system.

At the October 15, 2025 meeting, as per a June 2024 resolution,[2] the TPB will be asked to decide if the I-495 SEL project should be included in the continued development of the next National Capital Region Transportation Plan, Visualize 2050. One final comment period, from Thursday, October 23 to Friday, November 21, 2025, will be held on the entire plan, in advance of the TPB's action on plan adoption in December.

BACKGROUND OF VISUALIZE 2050

In June 2021, the Board adopted R19-2021 to update Visualize 2045 by December 2024 with a zero-based budgeting (ZBB) perspective. In June 2022, Visualize 2045 was approved. Following its

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[1] "Air Quality Conformity Analysis: Visualize 2050 and FY 2026-29 TIP, Draft Scope of Work" (Washington, D.C.: National Capital Region Transportation Planning Board, Metropolitan Washington Council of Governments, April 3, 2024).

[2] "Resolution on Inclusion of the I-95/I-495 Southside Express Lanes Project in the May 15, 2024 Approved Project Submissions for the Air Quality Conformity Analysis of the Visualize 2050 National Capital Region Transportation Plan and the FY 2026-2029 Transportation Improvement Program (TIP) (TPB R13-2024)," Resolution (Washington, D.C.: National Capital Region Transportation Planning Board, June 20, 2024), https://www.mwcog.org/events/2024/6/20/transportation-planning-board/.

approval, the Technical Inputs Solicitation was issued in February 2023, including the TPB Synthesized Policy Framework, findings of TPB scenario analyses, and instructions for the ZBB exercise. To provide additional time for MDOT and WMATA to resolve project and funding plans, a six-month schedule extension was provided in April 2023, moving the plan deadline to June 2025. The scope of work for the air quality conformity (AQC) analysis including the Cooperative Forecasts for Land Use (Round 10.0), the technical tools and assumptions, and the regionally significant for air quality (RSAQ) project inputs were approved in May 2024. In June 2024, the Board directed TPB staff to conduct two sets of AQC analyses: one with the I-495 Southside Express Lanes (SEL) project and one without. This led to a further extension of the plan's schedule to be due in December 2025.

CURRENTLY APPROVED INPUTS TO VISUALIZE 2050

As noted, in May 2024, the TPB approved several inputs for Visualize 2050 to be used in the AQC analysis and are described below.

Land Use and Demographic Forecasts

Metropolitan Washington Council of Governments (COG) staff worked with local planning directors for all of COG's member agencies to determine where growth will occur by 2050. Following a process to determine the population, employment, and household forecasts by locality, the data was compiled to create the Cooperative Forecast for Land Use Round 10.0 which was approved by the COG Board and subsequently by the TPB. The Cooperate Forecast data, a key input to developing Visualize 2050, is applied to the TPB's Traffic Analysis Zones (TAZs), which are structured to reflect currently approved local and comprehensive plans and zoning. The Cooperative Forecast data, a key input to developing Visualize 2050, is applied to the TPB's Traffic Analysis Zones (TAZs), which are structured to reflect currently approved local and comprehensive plans and zoning. The data provides a basis from which future air quality conformity and system performance can be assessed.

Technical Tools and Assumptions

In addition to the Cooperative Forecasts Round 10.0, the table below summarizes many other TPB-approved technical inputs. These were necessary to conduct the AQC analysis for Visualize 2050 and the FY 2026-2029 TIP in compliance with the Air Quality Conformity regulations. The information in Table 1 was used in the travel demand forecasting model and motor vehicle emissions model to determine if the total on-road mobile source ozone emissions will be within the EPA-approved levels as well as measuring the future system performance.

Table 1: TPB approved Technical Tools and Assumptions for Visualize 2050 Air Quality Conformity Analysis

Pollutants	Ozone Season VOC and NOx
Emissions Model	MOVES4
Conformity Test	Budget Test: Using EPA approved mobile emissions budgets from the 2008 Ozone NAAQS Maintenance Plan
Vehicle Fleet Data	December 2023 vehicle registration data
Geography	8-hour ozone non-attainment area

Network Inputs	Regionally significant projects
Land Activity	Cooperative Forecasts Round 10
HOV/HOT	VA: I-66, I-95, I-395, and I-495 are all HOT3+; all HOV facilities will be HOV2+ through 2050 MD: HOV facility on US 50 will remain HOV2+ through 2050; HOV facility on I-270 will convert from HOV2+ to HOT3+ when additional lanes are added;
Roadway Restrictions	Roadway restrictions, such as truck prohibitions, are reflected in the travel model network using information supplied by the Departments of Transportation
Analysis Years	2025, 2026, 2030, 2040, 2045, and 2050
Modeled Area	6,800 square mile area with 3,722 Transportation Analysis Zones (TAZs)
Travel Demand Model	Gen2/Version 2.4.6

Projects Regionally Significant for Air Quality (RSAQ)
As noted in the technical inputs table above, the approved regionally significant highway capacity projects are expected to cumulatively add approximately 530 lane miles to the region's transportation network---an overall increase of about three percent. This total includes 239 arterial lane miles, representing a two percent increase. These arterial improvements encompass major arterials, minor arterials, and collector roadways.

The network will also gain 291 freeway and expressway lane miles---an eight percent increase---including 86 lane miles of tolled facilities (81 new HOT express lane miles and five electronic toll road lane miles). If approved, the I-495 Southside Express Lanes (SEL) project would contribute an additional 41 express lane miles to the freeway and expressway network, raising the total number of freeway and expressway lane miles to 332, representing a further 1 percent increase.

A total of 25 RSAQ projects will expand the region's transit capacity, comprising 14 bus rapid transit (BRT)/bus projects, nine commuter rail projects, one light rail project, and one streetcar project.

BACKGROUND ON AIR QUALITY CONFORMITY

Visualize 2050 must comply with specific federal requirements, one such requirement being that the transportation plan must align with or "conform" to the region's State Implementation Plan (SIP). The SIP outlines how the region will meet and maintain the federal National Ambient Air Quality Standard (NAAQS) as defined in the Clean Air Act and its Amendments (CAAA). The SIP includes specific goals the region needs to achieve, and one such goal is that the transportation plan must yield mobile (on-road) regional emissions below specific limits for certain pollutants. These limits are known as the Motor Vehicle Emission Budgets (MVEBs). The metropolitan Washington region is currently classified as non-attainment for the ground-level ozone NAAQS; therefore, the SIP contains MVEBs related to this pollutant. Ground-level ozone is the result of two precursor pollutants, Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NO_X), combining in the presence of sunlight. The MVEBs set a ceiling on how much of these two precursor pollutants can be produced at the regional level. The

transportation plan must demonstrate that its associated emissions of these precursor pollutants will be below the MVEBs to receive federal approval.

AIR QUALITY CONFORMITY ANALYSIS RESULTS

As previously mentioned, a final decision has not been made on whether the I-495 SEL will be included in Visualize 2050, so the air quality conformity analysis was performed twice, with and without the I-495 SEL. Upon completing the analysis, it was noted that the total regional emissions, calculated with and without the I-495 SEL, were identical. Table 2 summarizes the results, and Figures 1 and 2 show that total mobile emissions generated in the transportation plan fall below the MVEB, demonstrating that the transportation plan conforms to the SIP.

Table 2: 2025 and 2050 estimates of NOx and VOC emissions, with and without the I-495 SEL project

Model Output Measure	Today	2050 without the I-495 SEL	2050 with the I-495 SEL
Nitrogen Oxides (NOx) (Short Tons*/Day)	45.9	12.1	12.1
Volatile Organic Compounds (Short Tons*/Day)	28.5	14.9	14.9

* Emissions are displayed using one decimal point to be consistent with the MVEBs.

Figure 1: Visualize 2050 Air Quality Conformity Mobile Source Emissions and Mobile Emissions Budgets Ozone Season: Nitrogen Oxides (NOX)

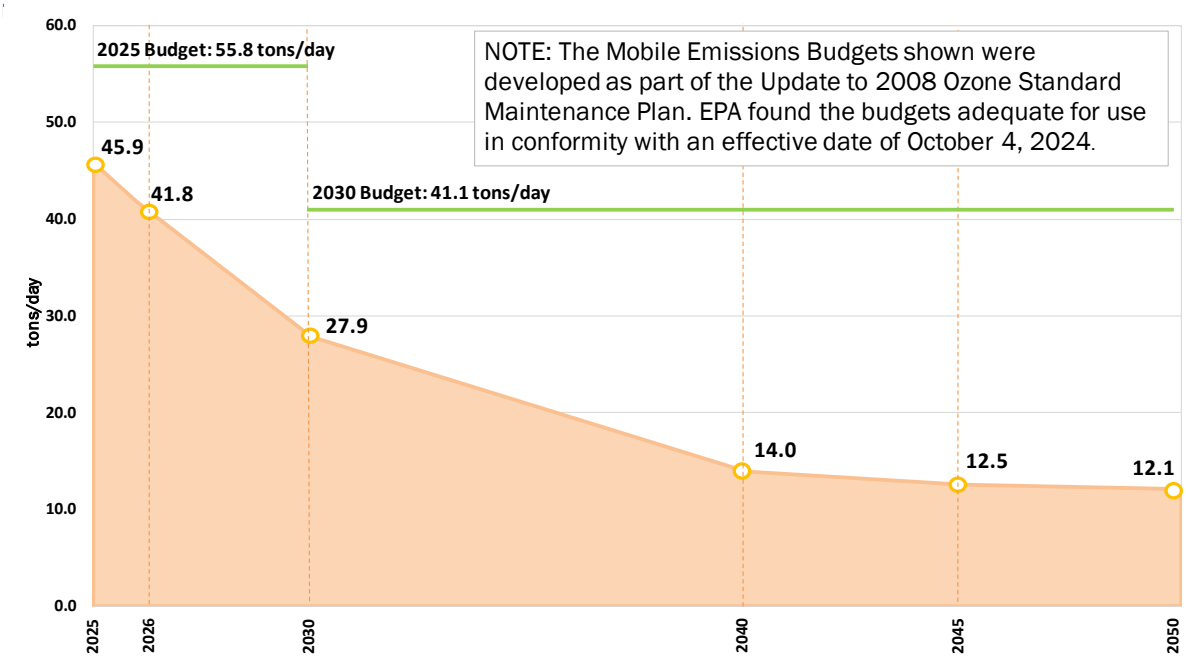
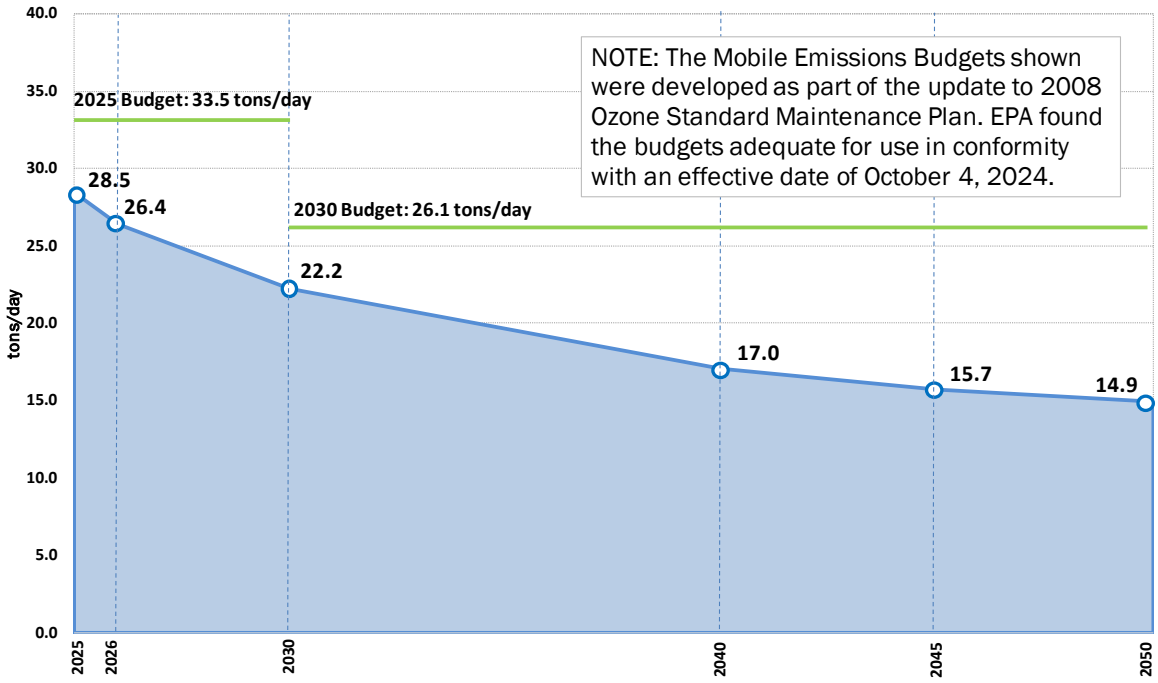


Figure 2: Visualize 2050 Air Quality Conformity Mobile Source Emissions and Mobile Emissions Budgets Ozone Season: Volatile Organic Compounds (VOC)



The overall impact of the I-495 SEL on total emissions is minor in comparison to the entirety of emissions generated across the region. In general, past TPB staff analyses have shown that "it is challenging to make substantial progress on the TPB's goals by adding any individual project or project mix to the existing system."[3] While each individual project, including the I-495 SEL, impacts traffic patterns to some extent, individual projects tend to have minimal impact on various metrics, such as emissions, at the regional level, as they affect a limited number of over 20 million daily trips taken in the region. TPB staff have found that policies that impact everyone (e.g., vehicle electrification, telework, and pricing) tend to have the largest impact on emissions and other metrics.

RESULTS OF MOBILE SOURCE EMISSIONS ANALYSIS FOR OTHER POLLUTANTS

Due to the transportation sector's significant contribution to emissions, the TPB tracks various types of emissions that the region is not legally required to assess. The EPA's 2016 revocation of the 1997 fine particle ($PM_{2.5}$) NAAQS means the region no longer needs to demonstrate conformity for this pollutant. Nonetheless, staff have estimated $PM_{2.5}$ emissions for Visualize 2050 to continue to track emissions trends for the pollutant. As shown in Figure 3 and Table 3, $PM_{2.5}$ emissions are forecasted to decrease between 2025 and 2050 by 28%, and emissions with the I-495 SEL are 0.1% lower than without it.

[3] Srikanth, Kanti, and Stacy Cook. "A Summary of the TPB and COG Scenario Study Findings: Informing Planning for the Metropolitan Washington Region." Page 19. Draft Report. National Capital Region Transportation Planning Board, Metropolitan Washington Council of Governments, November 3, 2022. https://www.mwcog.org/events/2022/11/4/tpb-technical-committee.

Figure 3: Fine Particles (PM2.5) Mobile Source Emissions

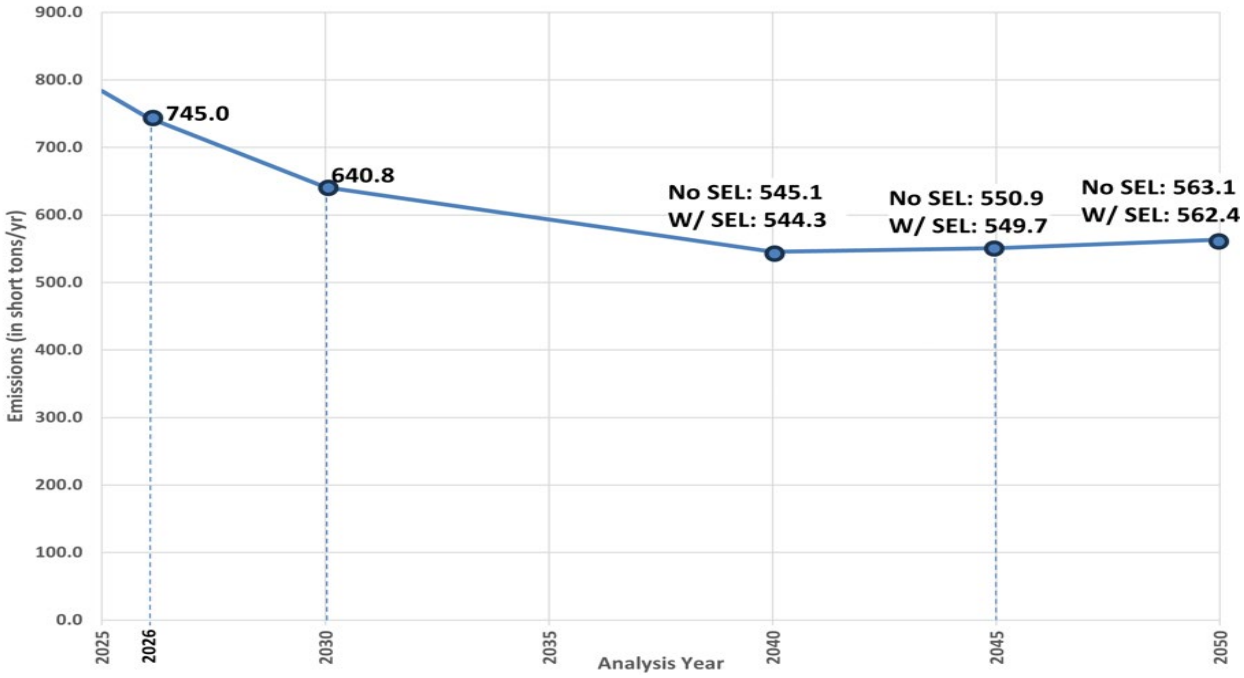


Table 3: Fine Particles $PM_{2.5}$ Model Output Measures

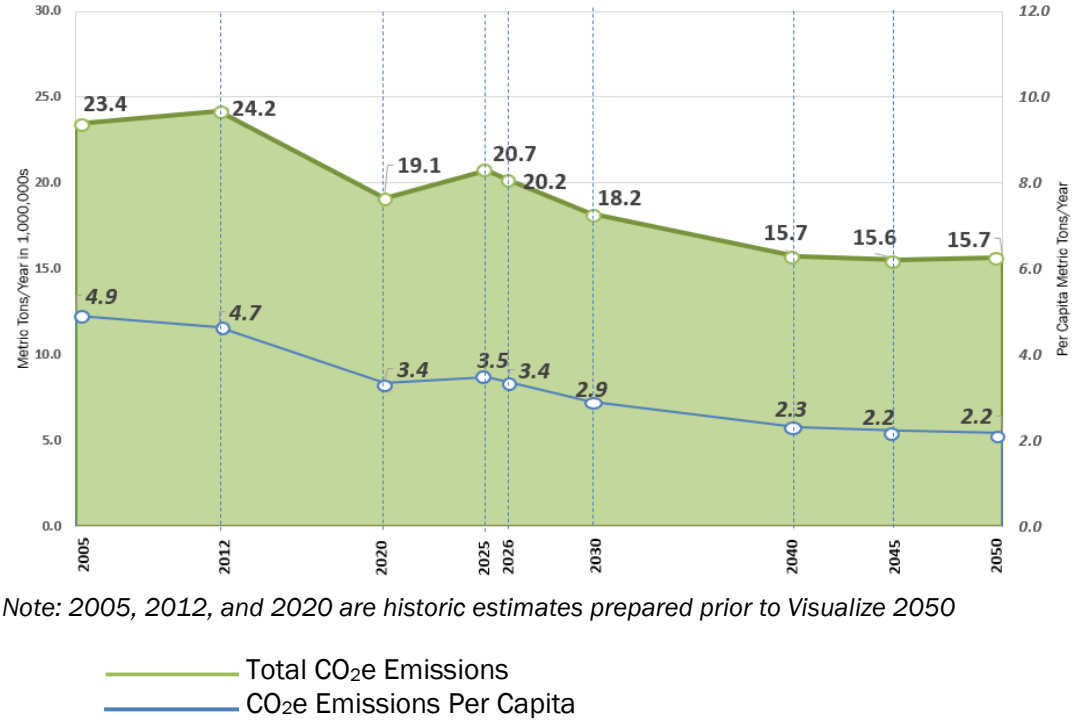
Model Output Measure	Today	2050 without the I-495 SEL	2050 with the I-495 SEL
PM2.5 (tons)	783.2	563.1	562.4

In 2010, the TPB started proactively estimating and reporting future greenhouse gas (GHG) mobile source emissions (expressed in carbon dioxide equivalents or CO_2e) in the regional transportation plan. The analysis has shown that total on-road GHG emissions decrease by 24% between 2025 and 2050, while emissions per capita decrease by 37% during the same period (see Figure 4 and Table 4). GHG emissions are identical for both options, with and without the SEL project.

The emission reductions in both $PM_{2.5}$ and GHGs between today and 2050 can be largely attributed to vehicle standards that reduce emissions and increase fuel efficiency. Upticks in both of these emissions are projected to occur between 2040 and 2050 as the vehicles meeting stricter standards saturate the overall fleet, and benefits from improved fuel efficiency standards and vehicle electrification no longer keep pace with projected VMT increases. TPB staff also continue to work with the MWCOG Department of Environmental Programs staff to monitor the region's compliance with the recently adopted and more stringent 2024 $PM_{2.5}$ NAAQS.[4]

[4] Reconsideration of the National Ambient Air Quality Standards for Particulate Matter, 89 Fed. Reg. 16202 (March 6, 2024)

Figure 4: Greenhouse Gas Mobile Source Emissions CO_2e and CO_2e Per Capita



Note: 2005, 2012, and 2020 are historic estimates prepared prior to Visualize 2050

Table 4: Greenhouse Gas Mobile Source Emissions CO_2e and CO_2e Per Capita Model Output Measures

Model Output Measure	Today	2050 without the I-495 SEL	2050 with the I-495 SEL
CO_2e (metric tons)	20.7	15.7	15.7
CO_2e per capita	3.5	2.2	2.2

SELECT PERFORMANCE ANALYSIS RESULTS

The performance analysis of Visualize 2050 considers how well the anticipated transportation system will accommodate current and forecast travel demand and address mobility and accessibility challenges. This analysis uses output from the TPB's travel demand model, which forecasts where, when, and how people will travel around the region in coming decades. To make its predictions, the model relies on the latest regional population and job growth forecasts from the Metropolitan Washington Council of Governments, information on existing travel patterns from the TPB's Household Travel Survey, and the future transportation system. While the full performance analysis is scheduled to be presented in Fall 2025 including more than twenty measures, this analysis provides a summary (see Table 5) of future performance while supporting TPB's current Visualize 2050 deliberations, that is, noting if and where I-495 SEL would have an appreciable impact on forecasted regional trends.

Overall, in conducting this analysis staff found many of the measures of accessibility, mobility, congestion, and delay are not appreciably different with or without I-495 SEL. The analysis shared here does note instances where the I-495 SEL project may have an impact in 2050; however, the region's long-term performance trends are forecasted to continue regardless of its inclusion or not. TPB staff is not concluding that the I-495 SEL project has no impact within parts of the region but rather that the geographic scope of the TPB planning area and methodology designed for examining the long-term impact of Visualize 2050 in its entirety is less suited for identifying the impact of a single project.

Table 5: Summary of Select Performance Measures

Model Output Measure		**Today**	**2050 without the I-495 SEL**	**2050 with the I-495 SEL**
Share of People Inside Regional Activity Centers		28%	33%	33%
Share of Jobs Inside Regional Activity Centers		63%	64%	64%
Share of People Close to High-Capacity Transit		16%	26%	26%
Share of Jobs Close to High-Capacity Transit		40%	46%	46%
Access to Jobs by Auto (AM Peak, 45-min)		1.06M	1.01M	1.02M
Change in Access to Jobs by Transit (AM Peak, 45-min)		399k	460k	460k
Total Daily Vehicle Hours of Delay		929k	1.575M	1.550M
Average Minutes of Delay Per Trip		4.1	5.9	5.8
Change in Resident Vehicle Miles Travelled		n/a	-5%	-5%
Share of All Trips:	*Drive Alone*	41%	38%	38%
	Drive Two or More	40%	40%	40%
	Transit	7%	8%	8%
	Walk and Bike	12%	14%	14%
Share of Work Trips:	Drive Alone	60%	57%	57%
	Drive Two or More	11%	11%	11%
	Transit	24%	25%	25%
	Walk and Bike	5%	6%	6%

Growth in People and Jobs and the Region's Future Transportation System

Between Today and 2050, Round 10.0 of COG's Cooperative Forecast finds that the region will be home to an additional 1.2 million people and 800 thousand new jobs, a 21 and 24 percent increase, respectively. In context of implementing the TPB's priority strategy of bringing jobs and housing closer together, analysis identifies an increasing share of the region's population and jobs within Regional Activity Centers (RAC) and in close proximity to High-Capacity Transit (HCT) stations. By 2050, the share of people within RAC increases five percent to more than 33 percent and 10 percent growth in those close to HCT, more than 26 percent of people by 2050. For jobs, 64 percent will be inside RAC and 46 percent close to HCT, a six percent growth, by 2050.

The region's transportation system will grow by 2050 to help support the growth in people and jobs. By 2050, the region's roadway network will add an additional three percent of lane miles, increasing

from 17,124 to over 17,600. Of those lane miles, High-Occupancy Toll (HOT3+) express lanes increase between 81 to 122 lane miles, a 32 to 48 percent increase from the number of HOT3+ express lane miles Today.[5] High-Capacity Transit (HCT) lane miles will grow an additional 97 miles, a 31 percent increase from Today as additional Light Rail and Bus Rapid Transit services come online.

Access to Jobs

Analyzing roadway performance through the number of jobs accessible by auto during a 45-minute morning commute, the region will see a decline in access by 2050 with or without the I-495 SEL. This decline in access ranges from four to five percent below the 2025 level of nearly 1.06 million jobs accessible. Regionally, including the I-495 SEL identifies a decline in job access of four percent, or a total 1.02 million jobs accessible by 2050, and not including the project identifies a decline of five percent, or a total of 1.01 million jobs accessible by 2050. As the region forecasts growth in people and jobs, this contributes to increase demand on the region's roadway network and increases congestion and delay (see analysis below) along with the location of future jobs being outside of a 45-minute commute period for many residents.

Access to jobs by transit is expected to grow between Today and 2050. With additional HCT service planned for the region and forecasts expecting more people and jobs close to those transit services, the analysis finds a 16 percent increase in jobs accessible by transit during a 45-minute morning commute, increasing from more than 398 thousand to 460 thousand jobs accessible by 2050. The I-495 SEL project does not have an appreciable impact on the results of this measure.

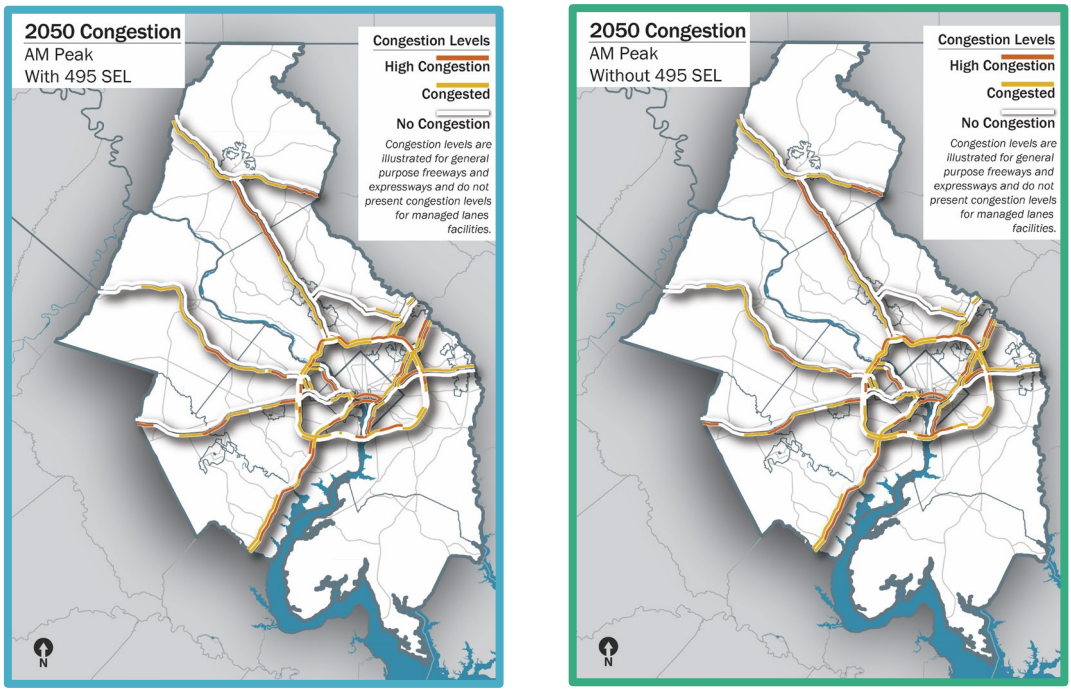
Delay and Congestion by Auto

Due to increasing demand on the region's roadways, delay and congestion are forecast to increase between Today and 2050. Total Daily Vehicle Hours of Delay, which represents time spent in traffic in congested conditions, will increase between 67 and 70 percent and Average Minutes of Delay per Trip increases between 44 and 46 percent, or from four minutes to nearly six minutes by 2050. Regionally, I-495 SEL modestly decreases growth in delay by three percent, from 70 to 67 percent, in Total Daily Vehicle Hours of Delay and two percentage points decline, from 46 to 44 percent, in Average Minutes of Delay Per Trip.

Regionally, congestion, defined as the forecasted ratio of vehicle to capacity during the morning commute on freeway and expressway general purpose lanes, increases for a large portion outside the I-495 SEL project area (see Figure 5). In the I-495 SEL project area, congestion levels decline considerably compared to not including the project but are not wholly eliminated. Areas outside but close to the I-495 SEL project area are impacted as well, with some lanes experiencing greater congestion likely due to the increased volume of auto travel.

[5] Final lane miles dependent on inclusion of I-495 SEL.

Figure 5: Visualize 2050 Congestion Levels with or without the I-495 SEL project



Resident Vehicle Miles Travelled Per Capita

Residents of the region are likely to be driving fewer miles per person in 2050 than they do today, meeting a noted target in COG's Region Forward. By 2050, the average resident is forecast to travel five percent less than they do today. This finding suggests that travel behavior in the region does respond to changes to the land use and transportation infrastructure environment, particularly that of the region's residents. These can include people making shorter trips due to jobs and housing being in closer proximity, using non-auto-based modes more often as more infrastructure is built, and changes to travel behavior due to the impact of congestion and delay.

Decline in Non-Single Occupancy Travel

The share of trips, both work and all purpose, in this region taken on non-single occupancy vehicle (SOV) modes like high occupancy auto, bicycle and pedestrian, and transit increases by 2050. For all trip purposes, rates of growth in non-SOV trips exceeds the growth in SOV trips, leading to more than 60 percent of trips taken on non-SOV modes by 2050 compared to 59 percent today. This is a similar trend for work trips, where 43 percent of commute trips will be taken on non-SOV modes by 2050 compared to 40 percent today. SOV travel will continue to be the predominate way regional commuters travel to work. The I-495 SEL project does not have an appreciable impact on the results of this measure.

COMMENTS RECEIVED

Thus far, the TPB has held two formal comment periods during the development of Visualize 2050. Additionally, the TPB has continued to receive comments about the project both for and against it during the monthly comment opportunities associated with the TPB's regular meetings.

The TPB has received several questions about the project and the draft analysis shared for its July 2025 meetings. TPB staff developed a Frequently Asked Questions (FAQ) document to respond to these questions which is attached to this memo and posted on the Visualize 2050 website, visualize 2050.org. Also attached to this memo is a June 25, 2025 letter from VDOT to MD SHA responding to MDOT comments on I-495 SEL.

NEXT STEPS

As shown in Table 6, in October, the TPB will vote on including the I-495 SEL in Visualize 2050 after which the draft Visualize 2050 plan, FY 2026-2029 Transportation Improvement Program, and Air Quality Conformity Analysis report will be completed and published for a 30-day public comment period. At the November TPB meeting, the TPB will receive a presentation on the draft plan, TIP, and Air Quality Conformity Analysis report. The 30-day comment period is planned for Thursday, October 23 until Friday, November 21. 2025. The TPB will receive a summary of the comments, and in December, the TPB will vote on the approval of the three documents: Visualize 2050, the FY 2026-2029 Transportation Improvement Program, and the Air Quality Conformity Analysis report.

Table 6: Remaining Schedule for Developing Visualize 2050

2025	
June	• TPB staff draft AQC and performance analysis for the plan and TIP.
July	• 7/16/2025 TPB meeting: Briefing on draft results of the Air Quality Conformity and system performance analyses for both options.
September	• 9/24/2025 Metropolitan Washington Air Quality Committee (MWAQC) reviews draft results of the AQC analysis for the updated plan and FY 2026–2029 TIP.
October	• **10/15/2025 TPB votes to move forward with or without the I-495 Southside Express Lanes project for continuation in the plan development and air quality conformity processes.** • Staff finalizes the draft Visualize 2050 plan, TIP, and AQC documents, website, reflecting TPB's action. • 10/23/2025 Staff releases above draft documents and advertises a 30-day public comment period.
November	• **11/19/2025 TPB briefed on all aspects of Visualize 2025 and the FY 2026-2029 TIP and comments received with responses, to date.** • **11/21/2025 Public comment period closes.**
December	• **12/17/2025 TPB updated on additional comments and responses and acts to: approve the results of the AQC analysis and adopt the Visualize 2050 plan and the FY 2026-2029 TIP.**

Attachments:
Frequently Asked Questions on Visualize 2050 Air Quality Conformity and System Performance Assessment
Letter from VDOT to MD SHA on June 25, 2025 re: I-495 Southside Express Lanes Study

VISUALIZE 2050
National Capital Region Transportation Plan

Frequently Asked Questions:
Visualize 2050 Air Quality Conformity and System Performance Assessment

1. **Has the process used, and the metropolitan transportation plan document (Visualize 2050) being developed, accounted for the changes to federal regulations?**

   - TPB staff believes that the process used to develop this update to the TPB's metropolitan transportation plan faithfully adheres to the current federal regulations for Metropolitan Planning Organizations (FHWA 23 CFR 450 Subpart C & FTA's 49 CFR 613). Staff's work on the plan has been done in close coordination with and guidance from the representatives of the U.S. Department of Transportation (FHWA and FTA) and the state departments of transportation and state and regional transit agencies. This work does not include any analysis of Diversity, Equity and Inclusion (DEI) policies, nor any current analysis of climate change which is not identified in the federal planning regulations noted above. Should there be any changes to the MPO regulations pertaining to development and/or content of the metropolitan transportation plan, the TPB will be able to initiate revisions or updates as needed.

2. **The air quality conformity and system performance assessment analyses indicate marginal or no improvement in roadway traffic operations from the I-495 Southside Express Lanes (SEL) project, while VDOT contends measurable meaningful improvements. Please explain.**

   - The TPB's air quality conformity and system performance analysis metrics are summarized at the regional level, while VDOT's analysis metrics are at the project/corridor level. The TPB's analyses are conducted for both a modeled area (6,800 sq. miles) and the TPB Planning Area (3,900 sq. miles), encompassing 23 jurisdictions. Regarding the Planning Area analysis, for the current year, there are over 13 million vehicle trips, and 122 million vehicle miles traveled on about 17,000 lane-miles of roadways over the entire 24-hour period of a typical weekday. The reported metrics, such as volumes, speeds, and delay, are averaged across this vast area and thousands of miles of roadway, which means that the impact of individual transportation projects is generally not very large at the regional level. TPB staff's July presentation noted those measures where the data presents appreciable differences.[1] Project-level modeling analysis, as conducted by VDOT as part of their work per National Environmental Policy Act (NEPA) regulations, can estimate changes in travel and traffic operations at a finer level.

     Note, given the large scale of the metropolitan area and the vast amounts of various indicators for the entirety of the TPB Planning Area (like daily vehicle trips, vehicle miles traveled, number of roadway lane-miles, etc.), a modest change in forecasted results could, nonetheless, indicate a meaningful impact for some residents of the region, particularly those traveling in the associated corridor. The results being deliberated today are consistent with prior studies conducted by TPB staff.[2]

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[1] Cristina Finch, Rob d'Abadie, and Sergio Ritacco, "Finalization of Project Inputs for Air Quality Conformity Analysis: Visualize 2050 & FY 2026-2029 TIP," https://www.mwcog.org/events/2025/7/2/tpb-technical-committee/.

[2] Srikanth, Kanti, and Stacy Cook. "A Summary of the TPB and COG Scenario Study Findings: Informing Planning for the Metropolitan Washington Region." Draft Report. National Capital Region Transportation Planning Board, Metropolitan Washington Council of Governments, November 3, 2022. https://www.mwcog.org/events/2022/11/4/tpb-technical-committee.

3. **How do the changes in the emissions and performance metrics estimated for the I-495 SEL project, relative to today, compare with a Metrorail line serving this corridor (instead of express toll lanes)?**

   - Metrorail service along this corridor could be seen as an alternative to the express lanes being examined. Such an alternative analysis would typically be part of a fiscally unconstrained scenario analysis, which is not the case with Visualize 2050.

   - Federal regulations require that the TPB's metropolitan transportation plan (MTP), Visualize 2050, include only projects proposed to be implemented by an implementing agency with funding for the planning, design, construction, operations and maintenance demonstrated to be reasonably expected to be available. Projects included in a MTP cannot be based on an assumption or a scenario, rather they must meet these other requirements. The I-495 SEL project has been proposed by VDOT to be included in Visualize 2050, and the proposal meets the above criteria. There has been no proposal for a Metrorail service along this corridor that meets this criterion.

4. **What version of fuel economy standards and pace of electric vehicle adoption are assumed?**

   - Assumptions related to vehicular emissions used in the regional air quality conformity analysis correspond to those included in the U.S. EPA's mobile emissions model, MOVES. The EPA's emissions model used in TPB's conformity analysis, MOVES4, incorporates the regulations listed in Table 1-2 (page 8) of the MOVES4 overview document.[3] Two of the regulations included in MOVES4 are 1) Control of Air Pollution from New Motor Vehicles: Heavy-Duty Engine and Vehicle Standards (January 2023); and 2) Revised 2023 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions Standards (December 2021).

   - Increased adoption of electric vehicles is reflected in MOVES4 through a combination of user inputs/national defaults and emissions rates that are embedded in the model to achieve the emissions standards noted above. It is important to emphasize that the most aggressive vehicle electrification strategies, such as the Advanced Clean Cars II Rule, are not assumed in Visualize 2050.

5. **Last year, TPB staff said that the shift from EPA MOVES3 to MOVES4 resulted in lower estimated greenhouse gas (GHG) emissions (about 20%) and other pollutants in the modeling forecast. Is that the case with these results?**

   - The trend in the recent releases of the U.S. EPA emissions models has been lower estimates of GHG emissions and some criteria pollutants in future-year estimates. It is important to note that MOVES3 had a short shelf-life and was never used by TPB staff for either an air quality conformity analysis or for estimating greenhouse gas emissions for TPB's recent plans (Visualize 2045 OR Visualize 2050). Instead, the MOVES2014b model was used for Visualize 2045 and MOVES4 was used for Visualize 2050.

[3] "Overview of EPA's Motor Vehicle Emission Simulator (MOVES4)," Office of Transportation and Air Quality, EPA-420-R-23-019, August 2023, publication (https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P10186IV.pdf).

6. **The past estimates of on-road 2005 and 2012 GHG emissions in the region are now 10-12% higher in Visualize 2050 than those used in Visualize 2045. Could you please explain this? Does this have to do with the new MOVES model?**

   - Yes. To ensure that comparisons of GHG emissions across different periods of time are consistent, staff updated the GHG emissions estimates for 2005 and 2012 that were developed using the MOVES2014B model with estimates from the MOVES4 model. According to our analysis and EPA's own analysis, the MOVES4 model typically shows higher GHG estimates for historical years and lower estimates for future years.

7. **What rates of telecommuting are assumed?**

   - The model reflects pre-pandemic levels of telecommuting. The TPB's regional travel demand model does not have telecommuting rates as an explicit input. Rather, telecommuting is implicitly reflected in the trip generation model rates and resulting travel volumes used to calibrate and validate the model. The model calibration is based on the TPB's 2007/2008 Household Travel Survey, with the model subsequently further validated using traffic counts and transit ridership from 2018.

8. **Can you clarify the proposed lane configurations for the Build Scenario with the I-495 SEL project? Please clarify if any of the existing general purpose (local/non-tolled express lanes) lanes (in either direction of I-495) will be converted to HOT/Tolled Express lanes.**

   - The I-495 SEL project, as submitted by VDOT for inclusion in Visualize 2050, proposes to add two high-occupancy toll (HOT)/express lanes in each direction between the Springfield Interchange and MD 210 on which vehicles with three or more people travel toll-free, plus a new express bus transit route between the Branch Avenue Metro Station and Tysons Corner, to be operational in 2031.

   - A presentation by VDOT to the TPB at its April 15, 2025, meeting, displayed a planning-level schematic of the lane configuration across the bridge for the two options that VDOT had examined. The schematic shows five general purpose lanes (the same as what exists today) plus two HOT/express lanes in each direction.[4] Based on VDOT's presentation schematic, it appears that space from the existing shoulders on the bridge would be repurposed, and that no existing general purpose lanes would be converted to HOT/express lanes.

9. **What is the approximate width/number of lanes that will need to be converted to rail should transit be developed across the Woodrow Wilson Memorial Bridge (WWMB)?**

   - A presentation by VDOT to the TPB at its April 15, 2025, meeting, displayed a planning level schematic of the lane configuration across the bridge for a scenario with Metrorail operating across the bridge. The schematic shows five general purpose lanes plus one HOT/express lane in each direction implying that one of the HOT/express lanes would be needed, perhaps with some additional unused space, to accommodate Metrorail.[3]

[4] National Capital Region Transportation Planning Board (April 15, 2025). Agenda Item 8 - Presentation - Visualize 2050 - VDOT SEL Project Update (https://www.mwcog.org/file.aspx?&A=94h0xhr%2fLZoB1qmK3aGbH3q2VAeXC1cvvj3pej6Eojk%3d)

10. **The plan option that includes the I-495 SEL project does not account for emissions resulting from additional bottlenecks/idling cars on secondary and arterial roads during AM and PM peak periods. With the emissions resulting from congestion/backups on local arterial roads unknown at this point, could those additional emissions result in the region exceeding allowable emissions budgets?**

    - The travel demand modeling conducted for Visualize 2050 with the I-495 SEL project is able to and does predict the impact of the new lanes on traffic demand and operations on other roadways. Additionally, the emissions estimated by the regional air quality conformity analysis for the option including the I-495 SEL project do account for changes in emissions attributable to the project. The analysis does indicate that the ozone precursor emissions with the I-495 SEL project, including its impact on traffic operations on other roadways, will be below the currently approved motor vehicle emissions budgets. As noted in response to question #2, this was an expected outcome, as staff have historically found that single projects, even if large in scope, have a very modest impact on regional performance metrics, including emissions.

11. **Regarding the finding of more congestion on the I-495 general purpose lanes near the boundaries of the project, what did the analysis indicate regarding back-ups beyond the project limits and for local/state roads in proximity to or connecting to the project at the interchanges?**

    - As noted in response to question #2, the TPB's modeling is conducted for an area of about 6,800 sq. miles, and the analysis results are presented for the TPB's planning area of about 3,900 sq. miles. Consequently, the TPB's presentation of expected traffic operations on the roadways and transitways is summarized at a high level. At this level of analysis, modeling results indicate some increased congestion might occur on the Capital Beltway's general purpose lanes in the vicinity of the project's termini. VDOT's project planning modeling is, however, conducted at a much finer, project corridor level. Such models might contain additional roadways, smaller geographic areas to capture land use and roadway connections, and other features at a closer range. As such, for more detailed estimates on the effect on individual road segments, TPB staff would defer to VDOT's corridor-level NEPA analysis. VDOT presented such information as part of its April 15, 2025, briefing to the TPB (see footnote 4 on previous page).

COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION

Stephen C. Brich, P.E.
Commissioner

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June 25, 2025

Mr. Will Pines
Administrator
Maryland Department of Transportation State Highway Administration
P.O. Box 717
Baltimore, MD 21203

RE: I-495 Southside Express Lanes Study

Dear Administrator Pines –

The Virginia Department of Transportation (VDOT) values the continued partnership between our agencies as we collaborate to solve the most significant mobility challenges in the region including the heavily congested segment of the Capital Beltway that is the subject of the Commonwealth's I-495 Southside Express Lanes Study (I-495 SEL). We appreciate the engagement of your team over the last three years as we have advanced the concept to extend the express lanes network in this corridor with the goal of moving the most people as efficiently as possible and providing congestion relief and increased travel reliability.

VDOT is in receipt of the Maryland Department of Transportation's (MDOT) comments on I-495 SEL as part of our recent public hearings to support the National Environmental Policy Act (NEPA). We appreciate MDOT's identification of the three considerations for transit commitments, future Metrorail service and traffic impacts to adjacent local roadways. This letter is in response to highlight the manner in which these three considerations have been incorporated in the project or will be necessarily addressed as the project advances past the Visualize 2050 Constrained Long Range Plan (CLRP) update and NEPA process.

This letter will address the three elements Maryland's comments raised in greater detail; however, I want to reiterate several points first. Virginia cannot, and will not, build in Maryland without Virginia first satisfying Maryland's concerns and entering into an agreement. Virginia commits to the following:

- Identify the minimum transit investment the project can financially support;
- Ensure the project does not preclude the expansion of Metrorail on the Woodrow Wilson Memorial Bridge (WWMB) at sometime in the future, including details of design on the bridge and corresponding contractual language that will be legally enforceable; and

- Conduct a study to determine the impact to local roads and ensure impacts, if any, resulting from the project are addressed as part of the project.

Maryland comment #1 – Transit Commitment
As we have discussed, VDOT agrees with MDOT's position that any project along this corridor should support a multimodal future by incorporating meaningful transit commitments. Consistent with the stated goal to move the most people as efficiently as possible, the project itself provides the opportunity to create and expand transit connections across the corridor and throughout the region as the express lanes promote transit and other high occupancy vehicle (HOV) options. By providing a free, reliable option for buses, vanpools and carpools with three or more occupants, the express lanes move more people while reducing the number of vehicles on the road. As a result, the project is reasonably expected to help develop a robust transit ridership across the WWMB.

Furthermore, VDOT has clearly stated through this process the intent to continue our longstanding practice of incorporating on-going transit payments from express lanes projects as a means of extending the transit benefits of the express lanes. The Northern Virginia express lanes currently provide annual transit payments totaling more than $5 billion over the life of the various project agreements with more than $156 million in toll revenue provided to Northern Virginia's Commuter Choice program to date. As a tangible representation of this commitment on the I-495 SEL project, in July 2024 VDOT requested the inclusion of a new transit service in the Visualize 2050 CLRP update. This new transit service from Central-West Prince George's County to Tysons was a near-term investment strategy recommended in the 2023 I-495 Southside Transit/TDM Study completed jointly by the Virginia Department of Rail and Public Transportation and the Maryland Transit Administration. VDOT committed to funding this new service (estimated at $9 million in 2022 dollars for the initial, capital cost) as part of the I-495 SEL project should it advance to procurement as a public-private partnership. It must be acknowledged that the Commonwealth is in the early stages of determining the financial feasibility of the project and therefore cannot commit further to additional transit investments until procurement is underway, the full scope of the I-495 SEL project is known, and the financial feasibility determined. Should the project forecast a net positive revenue such that no public subsidy is required, the Commonwealth commits to a formal agreement between the two states that memorializes how we will prioritize investments and/or distribute funds that are to be used to support transit investments that benefit users in the corridor.

Maryland comment #2 – Preservation of Metrorail on WWMB
VDOT is also in agreement with MDOT's position that the project should support a multimodal future by not precluding a future Metrorail extension across the bridge. In partnership with the Federal Highway Administration, VDOT spent significant time and resources developing the concepts that are currently being studied to specifically preserve the ability to include rail in the future across the WWMB. VDOT has consistently communicated this commitment to rail indicating in our April 2024 letter to the Transportation Planning Board (TPB) that any future contract or concessionaire agreement would incorporate a requirement for conversion to rail transit when WMATA and the region are positioned to implement service across the WWMB. The commitment to not precluding a future Metrorail extension is reflected in the NEPA process currently underway and is consistent with the

NEPA decision issued in 2000. Both the forthcoming NEPA decision and the potential concessionaire agreement will serve as legally enforceable means of adhering to this commitment. Rather than a choice between waiting for a future Metrorail extension or improving traffic congestion and travel reliability now, the I-495 SEL project is a both/and solution that provides near term benefits that can ready the region for rail. This commitment will also be reflected in the major business terms that will be made public prior to the start of a procurement and will not change during a procurement.

Maryland comment #3 – Local Roads Impact Study
VDOT shares MDOT's concern that the project should minimize its impact to adjacent local roadways through evaluation of these impacts with detailed traffic analysis and corresponding commitments to mitigate any project generated impacts. It is indeed required that projects on limited access facilities such as interstates perform an operational analysis to ensure the facility itself and adjacent, parallel facilities perform in an acceptable manner. The I-495 SEL project will adhere to this requirement. The results of the required operational analysis must be consistent with the preferred alternative approved through the NEPA process. As such, VDOT does not initiate this analysis until the preferred alternative is identified and the more detailed design and traffic data developed.

VDOT has agreed to including in our draft NEPA document a clear commitment for the operational analysis and resulting collaboration with stakeholders, including Maryland, to review any local roadway impacts identified along with mitigation strategies aimed to resolve those impacts. As necessary, VDOT will ensure the NEPA document, or its subsequent Reevaluations capture any necessary project changes that may result.

In closing, I believe it is important to note that there is much work to be done to advance this regionally significant project. The September 2025 vote by the TPB for its inclusion in the CLRP simply allows the Commonwealth to proceed with the expenditure of millions of additional dollars to continue to refine the project's scope through more detailed design and supporting analyses, determine the project's financial feasibility, and continue to seek regional consensus on its implementation. VDOT cannot and will not advance this project to implementation without the support of Maryland. This includes concurrence and express approval from Maryland to build the project across the WWMB and into Prince George's County. Supporting the project's inclusion in the CLRP keeps the work progressing. If the I-495 SEL project is not included in the CLRP, all work will stop and with it the generational opportunity to deliver near-term congestion relief, expanded transit connections and travel reliability to Virginia and Maryland commuters and travelers throughout the National Capital Region.

Sincerely,

Stephen C. Brich, P.E.
Commissioner of Highways

cc: The Honorable W. Sheppard Miller III, Secretary of Transportation
Members, Transportation Planning Board
Alyia Gaskins, Mayor, City of Alexandria
Takis Karantonis, Chair, Arlington County Board of Supervisors
Jeffrey McKay, Chair, Fairfax County Board of Supervisors
Catherine Read, Mayor, City of Fairfax
Catherine McGhee, VDOT Deputy Commissioner
Angel Deem, VDOT Chief of Policy
Bill Cuttler, VDOT Northern Virginia District Engineer
Michelle Shropshire, VDOT Northern Virginia District Megaprojects Director