

VISUALIZE 2050

The logo for Visualize 2050 features the word "VISUALIZE" in a large, bold, white sans-serif font. Below it, the year "2050" is also in a large, bold, white font. The "0" in "2050" contains a stylized white and blue swoosh graphic that loops around the top and bottom of the "0".

National Capital Region Transportation Plan

Agenda Item 4

FINALIZATION OF PROJECT INPUTS FOR AIR QUALITY CONFORMITY ANALYSIS

Visualize 2050 & FY 2026-2029 TIP

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TPB Technical Committee
July 2, 2025



National Capital Region
Transportation Planning Board

Briefing Topics

- How we got here
- What has been approved to date
- What remains to be approved
- Technical analysis results to inform the decision
 - Air quality
 - Future system performance
- Next steps

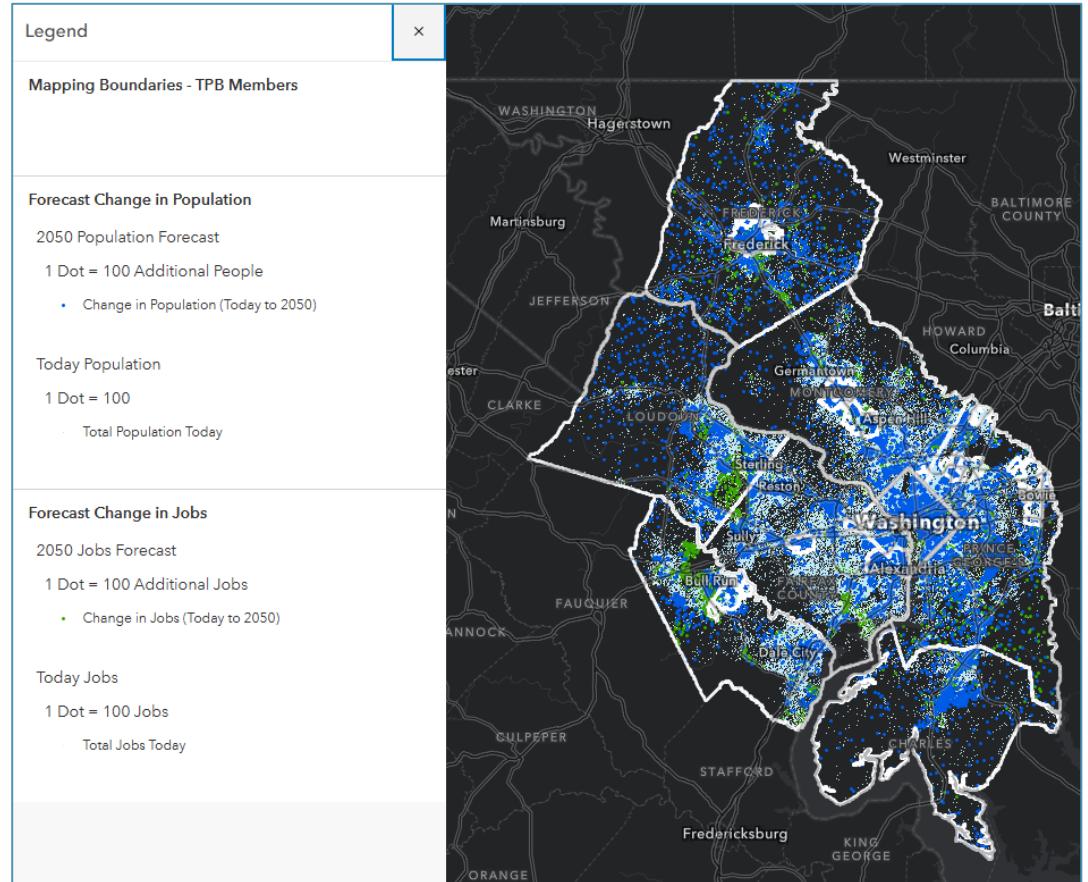
How we got here

- June 2021 R19-2021 to update Visualize 2045 by December 2024 with a zero-based budgeting (ZBB) perspective
- June 2022 Visualize 2045 approval
- February 2023 Technical Inputs Solicitation including
 - TPB Synthesized Policy Framework
 - Findings of TPB Scenario analyses
 - Instructions for the ZBB exercise
- April 2023 Six-month schedule extension, plan due June 2025
- May 2024 Inputs for the air quality conformity analysis partly approved including -
 - Cooperative Forecasts for Land Use (Round 10.0)
 - Technical Tools and Assumptions
 - Regionally Significant for Air Quality (RSAQ) Projects
- June 2024 Two sets of conformity analysis - with and without I-495 Southside Express Lanes (SEL) project; schedule extension, plan due Dec. 2025

What has been approved to date

Land Use and Demographic Forecasts

- Round 10.0 Cooperative Forecasts – Population, Employment, and Households for various future years through 2050
 - 1.25M more people
 - 550k more households
 - 800k more jobs
- Transportation Analysis Zone (TAZ) structure and zoning per currently approved local comprehensive plans and zoning



Technical Tools and Assumptions

Pollutants	Ozone Season Volatile Organic Compounds (VOC) and Nitrogen Oxides (NOx)
Emissions Model	MOVES4
Conformity Test	<u>Budget Test</u> : 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	<u>VA</u> : I-66, I-95, I-395, and I-495 are all HOT3+; all HOV facilities will be HOV2+ through 2050 <u>MD</u> : 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 or latest

Highway Projects Significant for Air Quality

- TPB has already approved over 120 highway capacity projects included in the Air Quality Conformity Analysis add 530 more lane miles (3%):
 - 239 more Arterial lane miles (2%)
 - 291 more Freeway and Expressway lane miles (8%)
 - 81 High-Occupancy Toll (HOT), 3+ people ride free, express lane miles
 - 5 general purpose electronic toll road lane miles

=> If TPB approves, I-495 SEL will add 1% or 41 more Freeway and Expressway HOT3+ express lane miles

- Time horizon for completing highway RSAQ projects:
 - 59 projects by 2030
 - 38 projects by 2040
 - 24 projects by 2050

Transit Projects Significant for Air Quality

- TPB has already approved over 25 transit capacity projects included in the Air Quality Conformity Analysis adding ~30.5% or 97 more High-Capacity Transit lane miles:
 - 18 light rail/streetcar lane miles
 - 79 Bus Rapid Transit (BRT) lane miles
- Time horizon for completing transit RSAQ projects:
 - 17 projects by 2030: BRT, Commuter Rail, Streetcar, Light Rail
 - 2 projects by 2040: BRT and Commuter Rail
 - 6 projects by 2050: BRT and Commuter Rail



Montgomery County Flash stop Burnt Mills (Montgomery County Council/Flickr)

What remains to be approved

I-495 Southside Express Lanes (SEL) Project

- Included in Visualize 2045 as a Study
- Submitted by VDOT for inclusion in the Visualize 2050 Air Quality Conformity Analysis
 - 2 HOT express lanes in each direction with 3+ people toll-free
 - Express transit route between the Branch Avenue Metro Station and Tysons Corner
 - Springfield Interchange to MD 210
 - Cost is \$2B, Completion year is 2031
- Public comments have been received in great numbers since the March 2024 comment period
- TPB undecided in 2024, making the decision in September 2025

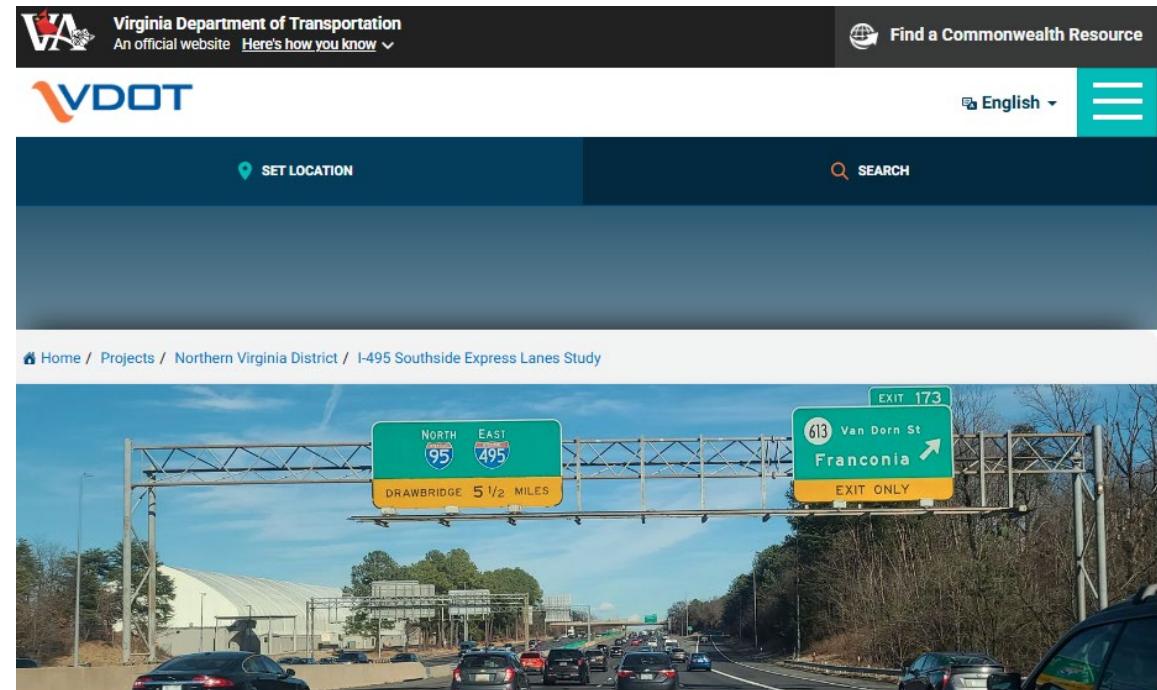


Woodrow Wilson Bridge VA to MD (Cristina Finch/COG)

VDOT Project Information on I-495 SEL

- VDOT has held their own public and stakeholder engagement opportunities as part of the NEPA process.
- Additional Information available on VDOT's website:

<https://www.vdot.virginia.gov/projects/northern-virginia-district/i-495-southside-express-lanes-study/>



I-495 Southside Express Lanes Study

City/county: Alexandria (city), Fairfax (county)

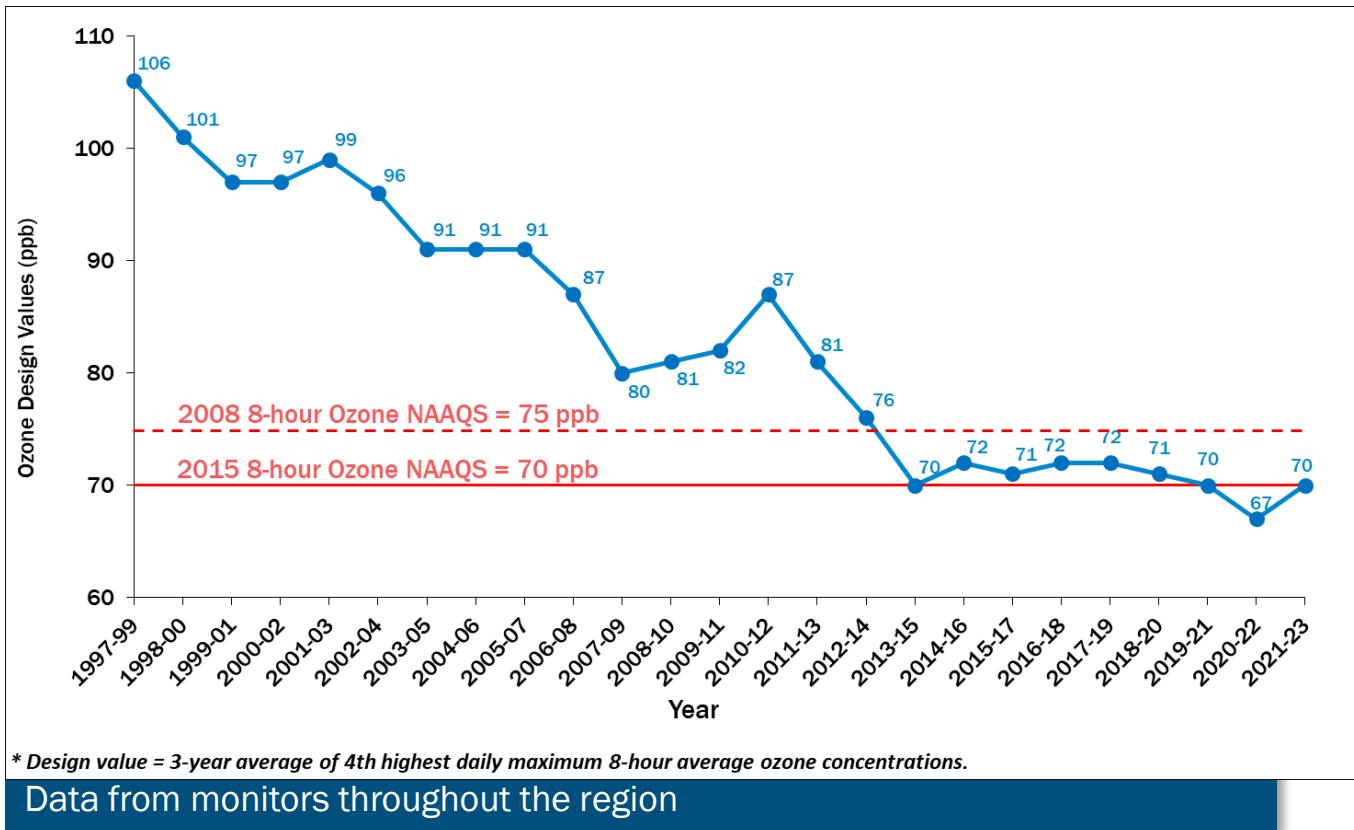
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Technical Analysis Results

Technical Analysis Results: Air Quality Conformity Analysis

Air Quality Trend 1999-2023

8-Hour Ozone Design Values Washington, DC-MD-VA Nonattainment Area (1999-2023)



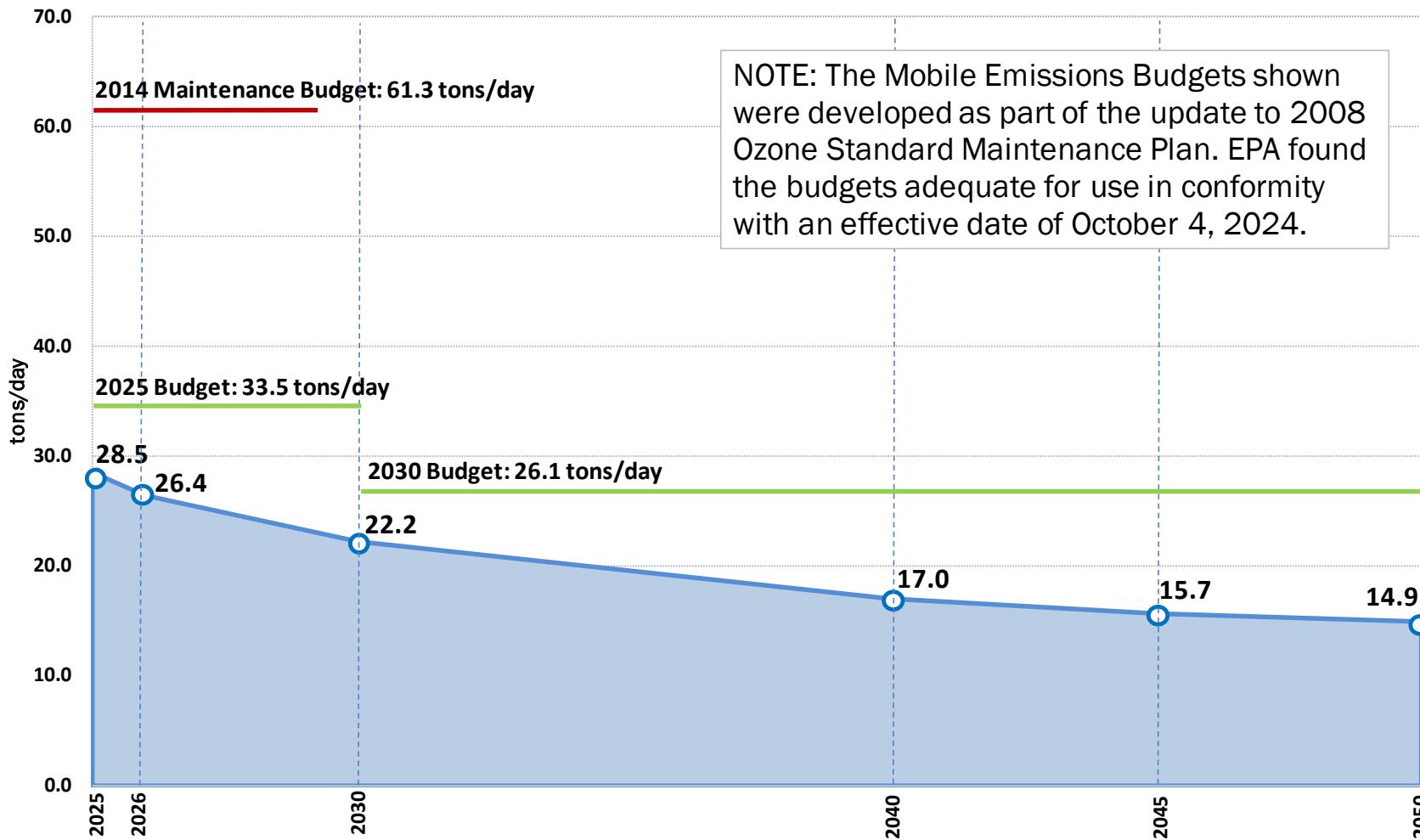
- Region is currently in attainment of the 2008 National Ambient Air Quality Standards (NAAQS) for Ozone
- Region has established motor vehicle emissions limits (budgets) to maintain 2008 NAAQS
- The region has attained the new 2015 NAAQS
- Region is developing new motor vehicle emissions budgets to maintain 2015 NAAQS

Air Quality Conformity

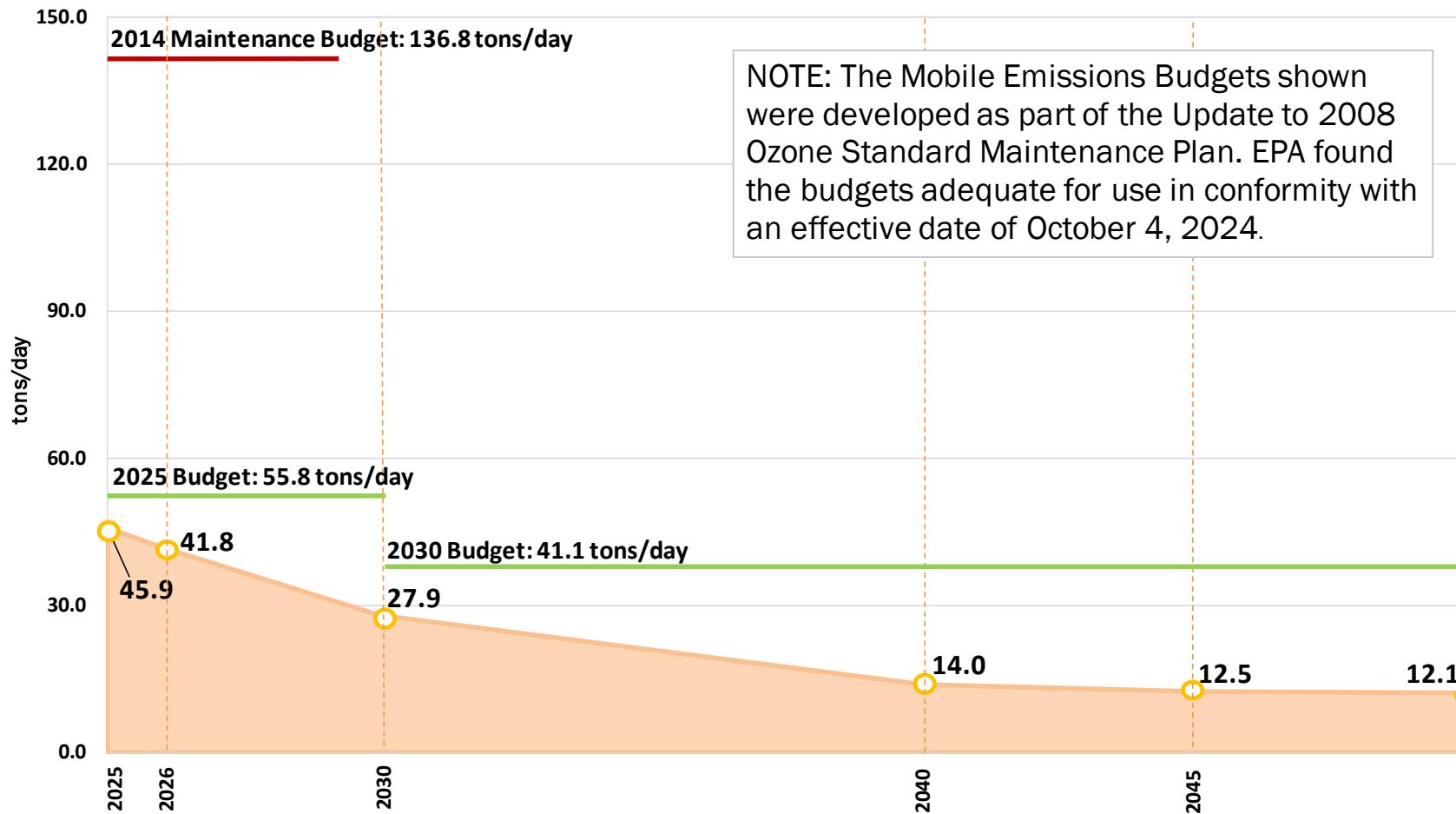
- The air quality conformity analysis was conducted twice, with and without the I-495 Southside Express Lanes (SEL)
- In both instances, the Visualize 2050 plan meets the federal air quality conformity requirements
 - Mobile source VOC and NO_x emissions associated with the plan/TIP are below EPA-approved motor vehicle emissions budgets
- **The total emissions estimates with and without the I-495 SEL are identical***
** To the first decimal place or within a tenth of a ton/day.*

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

Forecast Data



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



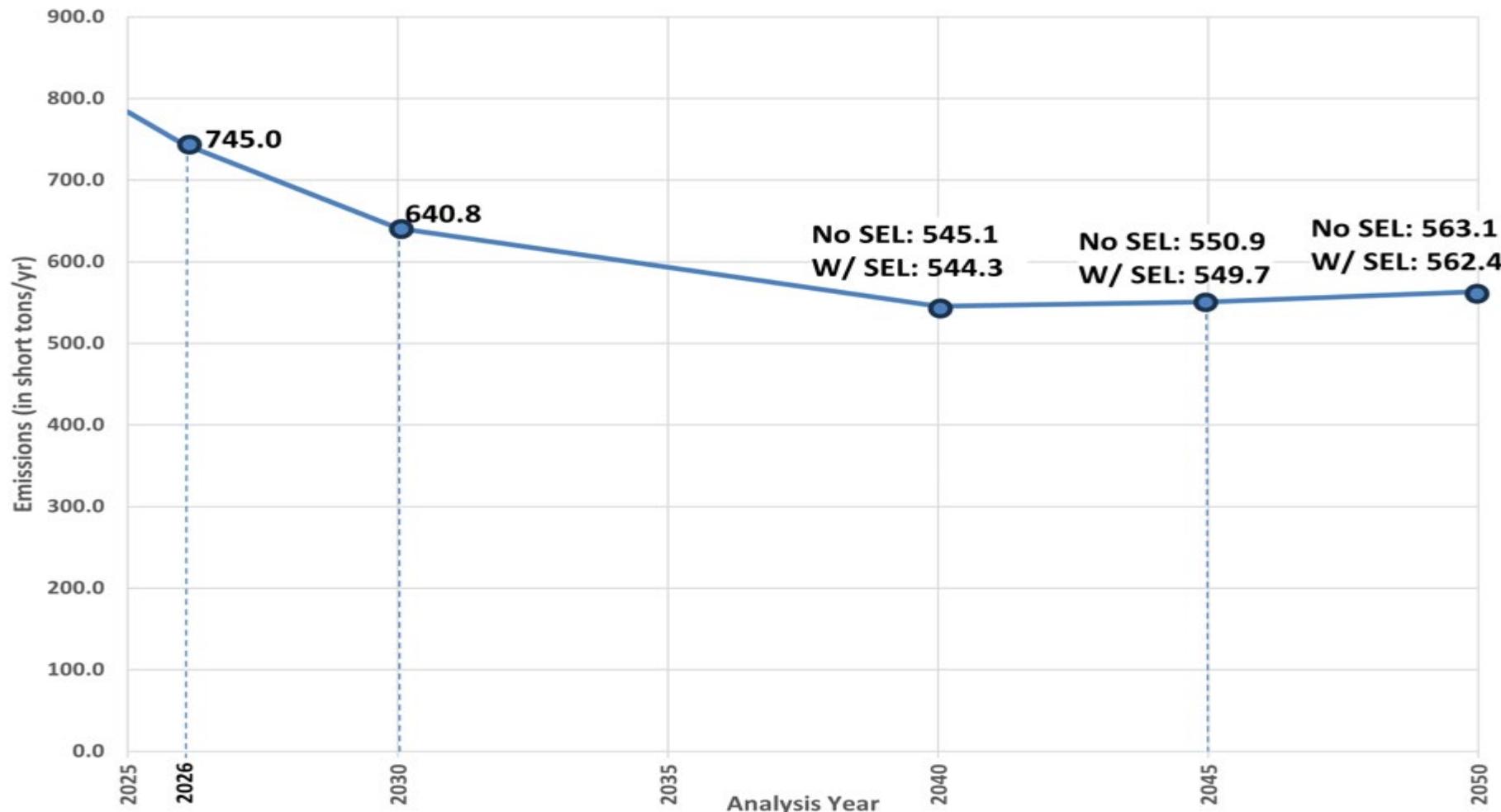
Forecast Data

Technical Analysis Results: Other Mobile Source Emissions

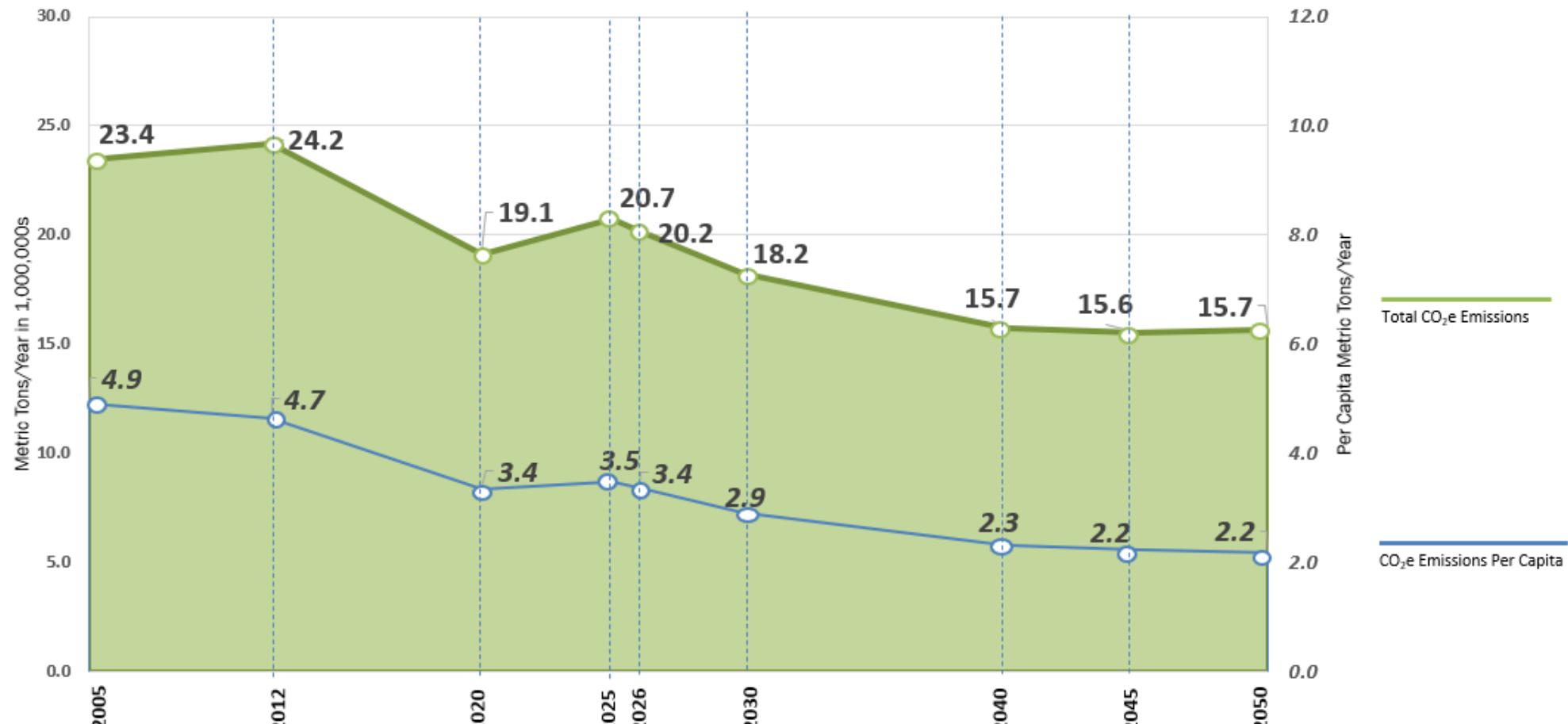
Other Mobile Source Emissions

- TPB analyzes other regional emissions in addition to those required under the Clean Air Act for conformity
- Fine particles emissions ($PM_{2.5}$) emissions:
 - Conformity requirements are no longer applicable
 - 28% decrease in emissions between today and 2050
 - **A difference of 0.1% between the two options in 2050 (slightly lower emissions in the analysis with I-495 SEL)**
- Greenhouse Gas (GHG) emissions:
 - No federal standards for GHG emissions
 - Show a 24% decrease in emissions and 37% decrease in emissions per capita between today and 2050
 - **Same emissions for both options, with and without I-495 SEL**

Fine Particles (PM_{2.5}) Mobile Source Emissions



Greenhouse Gas Mobile Source Emissions



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

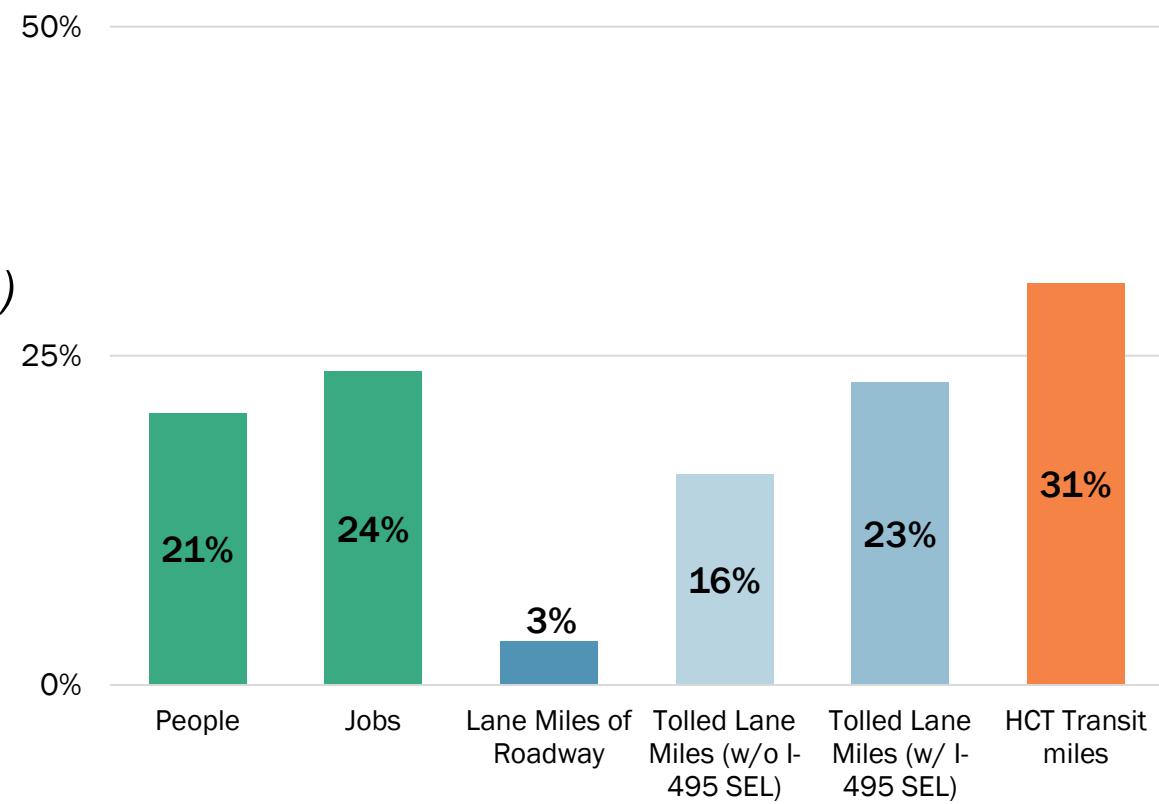
Technical Analysis Results: Future System Performance

Our Region and Future Transportation System

By 2050, the region anticipates growth:

- 21% increase in **People** (+1.2M)
- 24% increase in **Jobs** (+800k)
- 3% increase in **Lane Miles of Roadway**
 - 16% increase in **Tolled Lane Miles** without I-495 SEL (+530 *total lane miles*)
 - 23% increase in **Tolled Lane Miles** with I-495 SEL (+571 *total lane miles*)
- 31% more **High-Capacity Transit (HCT) miles** (+97)

Summary of Forecast Demographics and Transportation System Added by 2050



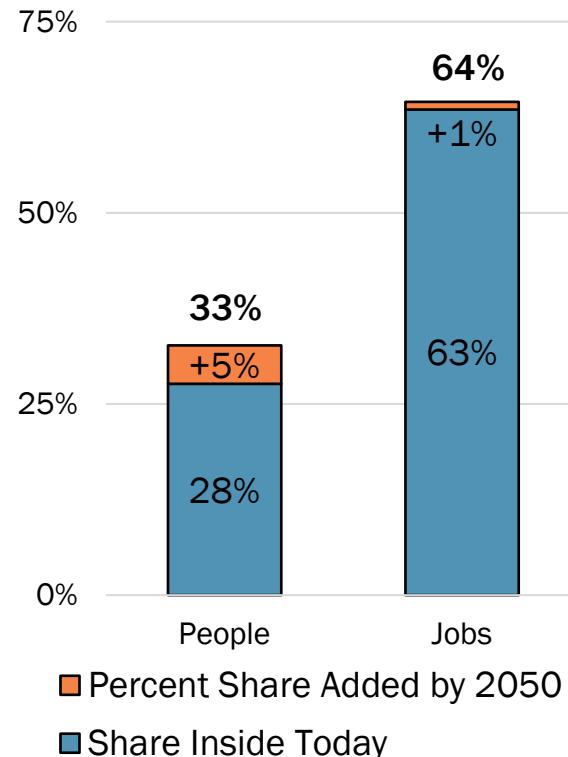
Regional Land Use and Transportation

TPB Priority Strategy: Bring Jobs and Housing Closer Together

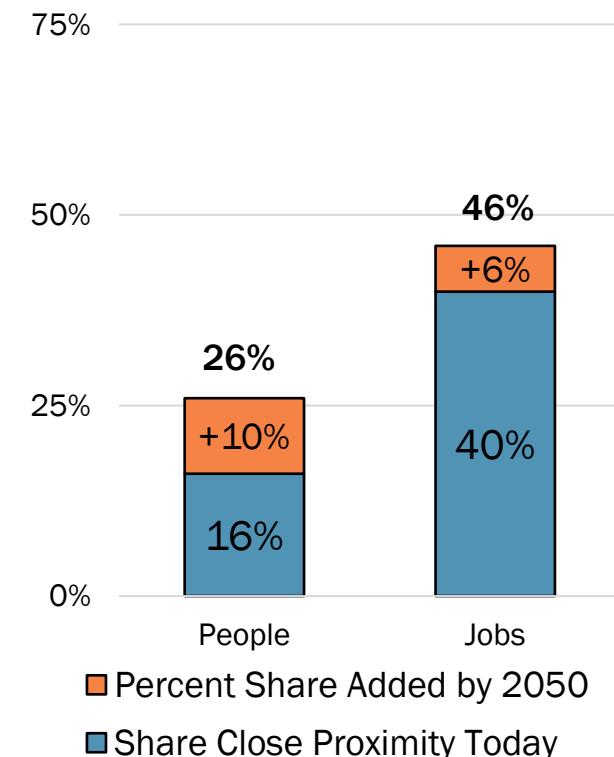
By 2050, forecasts expect increase share of People and Jobs inside Regional Activity Centers and High-Capacity Transit stations:

- People
 - 33% of People will live in Regional Activity Centers (5% increase)
 - 26% of People will live close to High-Capacity Transit (10% increase)
- Jobs
 - 64% of Jobs will be in Regional Activity Centers (1% increase)
 - 46% of Jobs will be close to High-Capacity Transit (6% increase)
- I-495 SEL has no current impact on land use forecasts

Share Inside Activity Centers



Share 1/2 mile from High-Capacity Transit station



Change in Access to Jobs by 2050

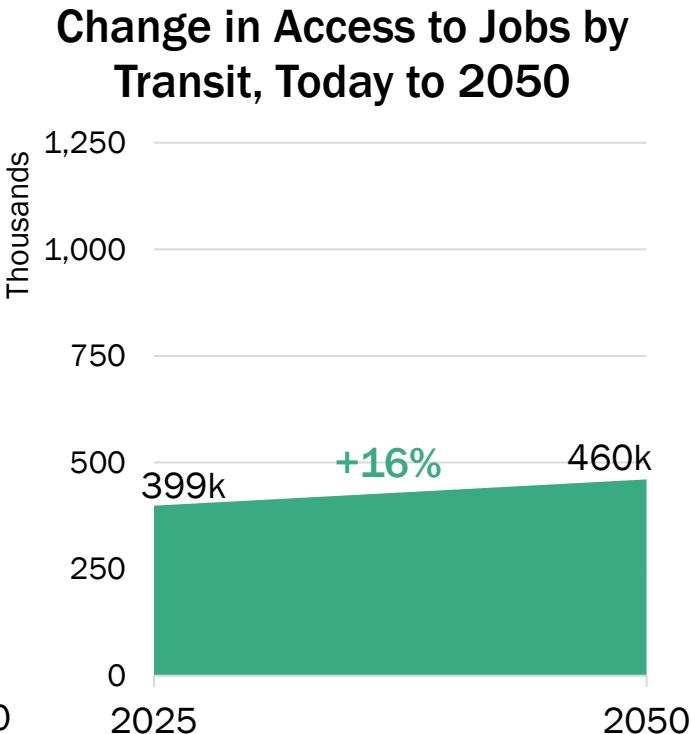
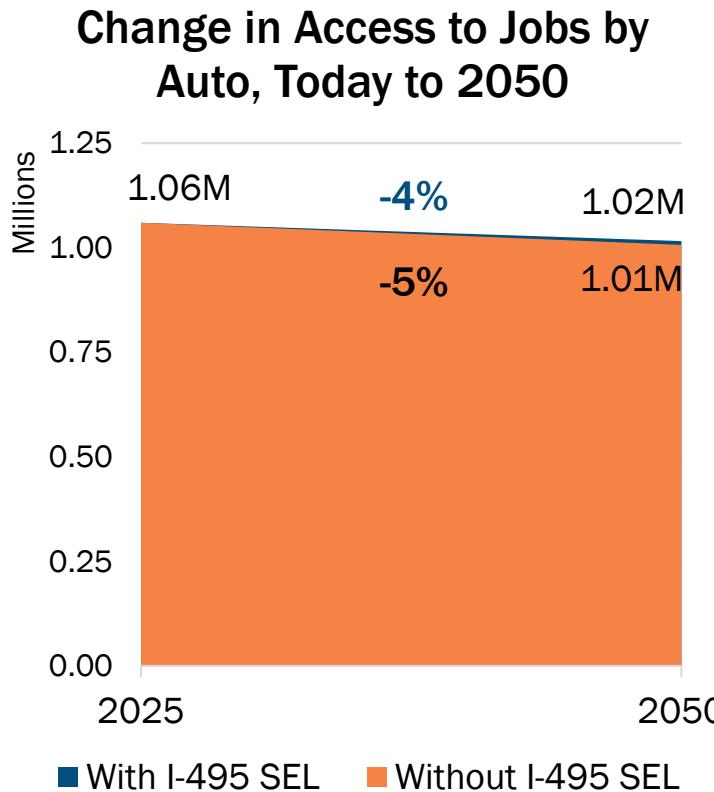
Regionally, Access to Jobs by Auto forecast to decline due to increased congestion and delay, by 2050:

- 5% without I-495 SEL
- 4% with I-495 SEL

Access to Jobs by Transit increases by 16% as more transit comes online and forecast expects more People and Jobs in close proximity

- I-495 SEL has no direct appreciable impact with current planned transit service

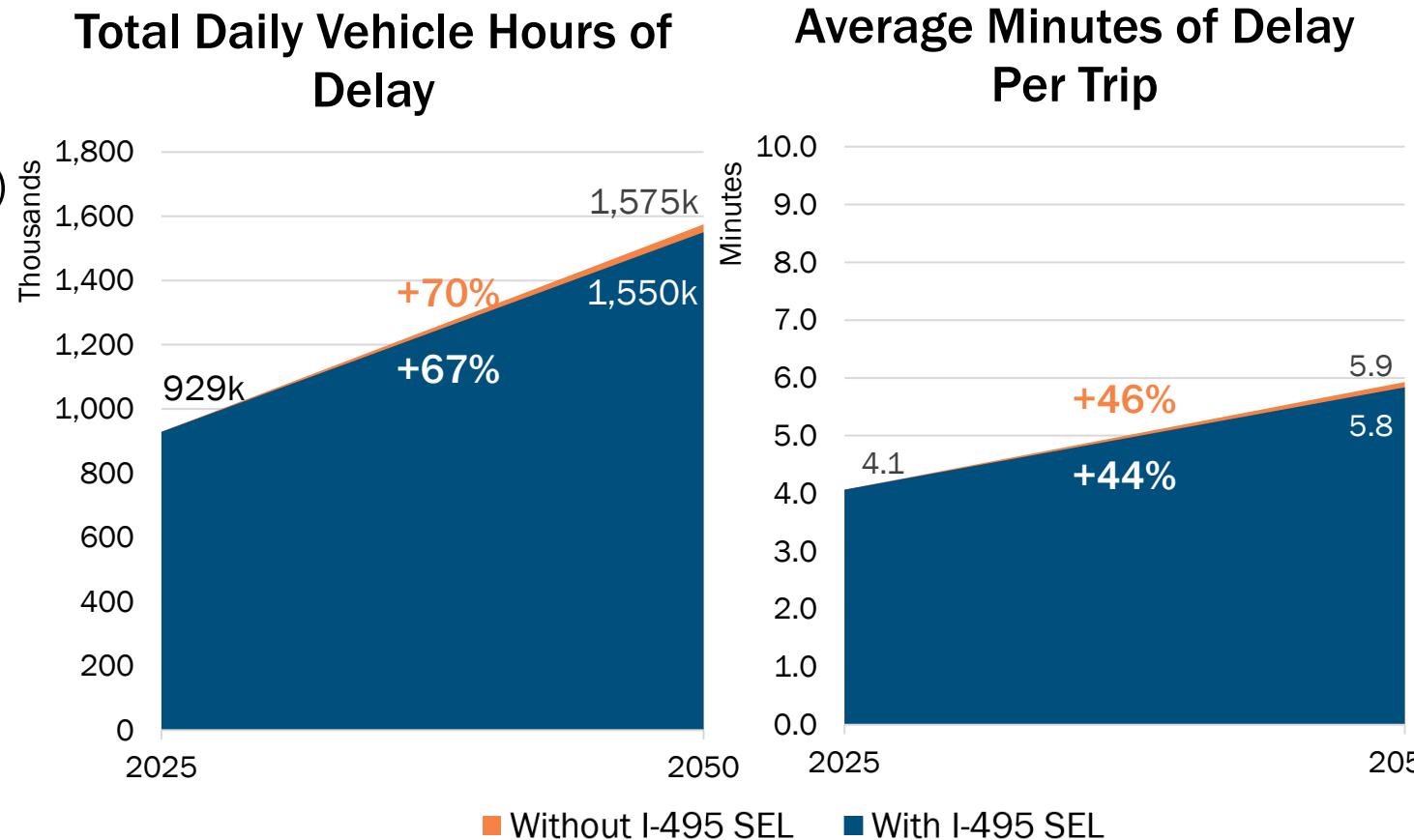
Access is calculated for AM Peak Period travel using a 45-minute commute



Delay by Auto Increases

Delay continues to grow from increased demand on roadways and congestion, by 2050:

- Total Daily Vehicle Hours of Delay:
 - +70% without I-495 SEL (1.58M)
 - +67% with I-495 SEL (1.55M)
- Average Minutes of Delay Per Trip
 - +46% without I-495 SEL (5.9 mins)
 - +44% with I-495 SEL (5.8 mins)

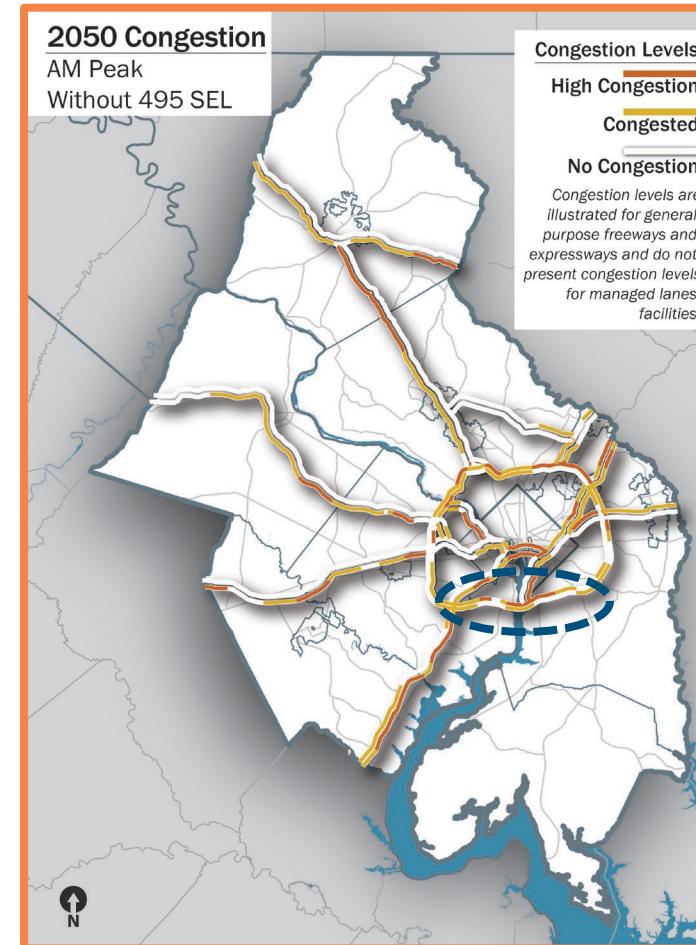
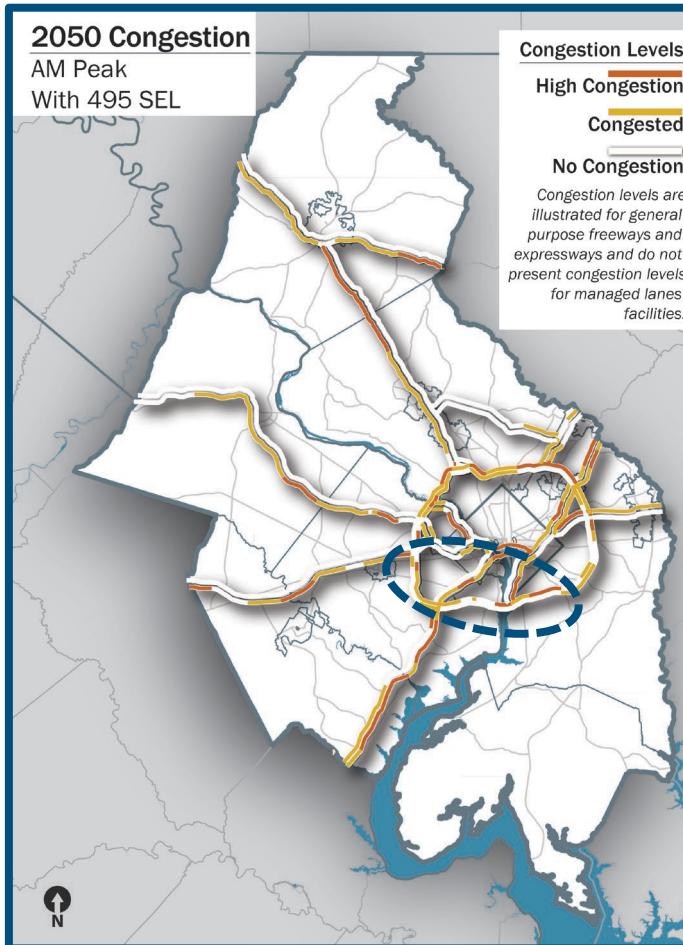


Regional Congestion Increases

AM Peak Congestion on freeway and expressway general purpose lanes increases regionally as vehicle volume exceeds roadway capacity

At a regional scale, impact of including the I-495 SEL:

- Less congestion on I-495 general purpose lanes in project study area
- More congestion on I-495 general purpose lanes near project area boundaries
- Without I-495 SEL congestion increases at rates similar to the region as a whole



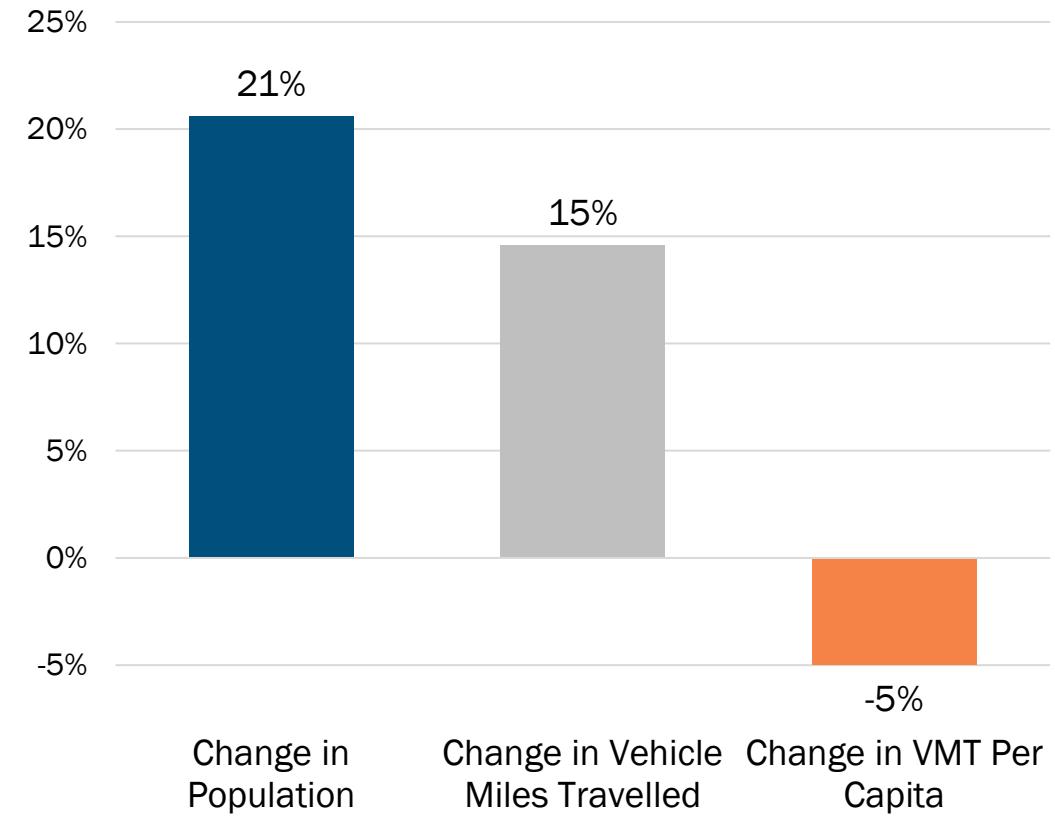
Average Resident Will Travel Less by Auto by 2050

Region Forward Target: Reduce daily vehicle miles traveled (VMT) per capita

By 2050, the **average resident in this region will travel 5% less miles by vehicle than Today**

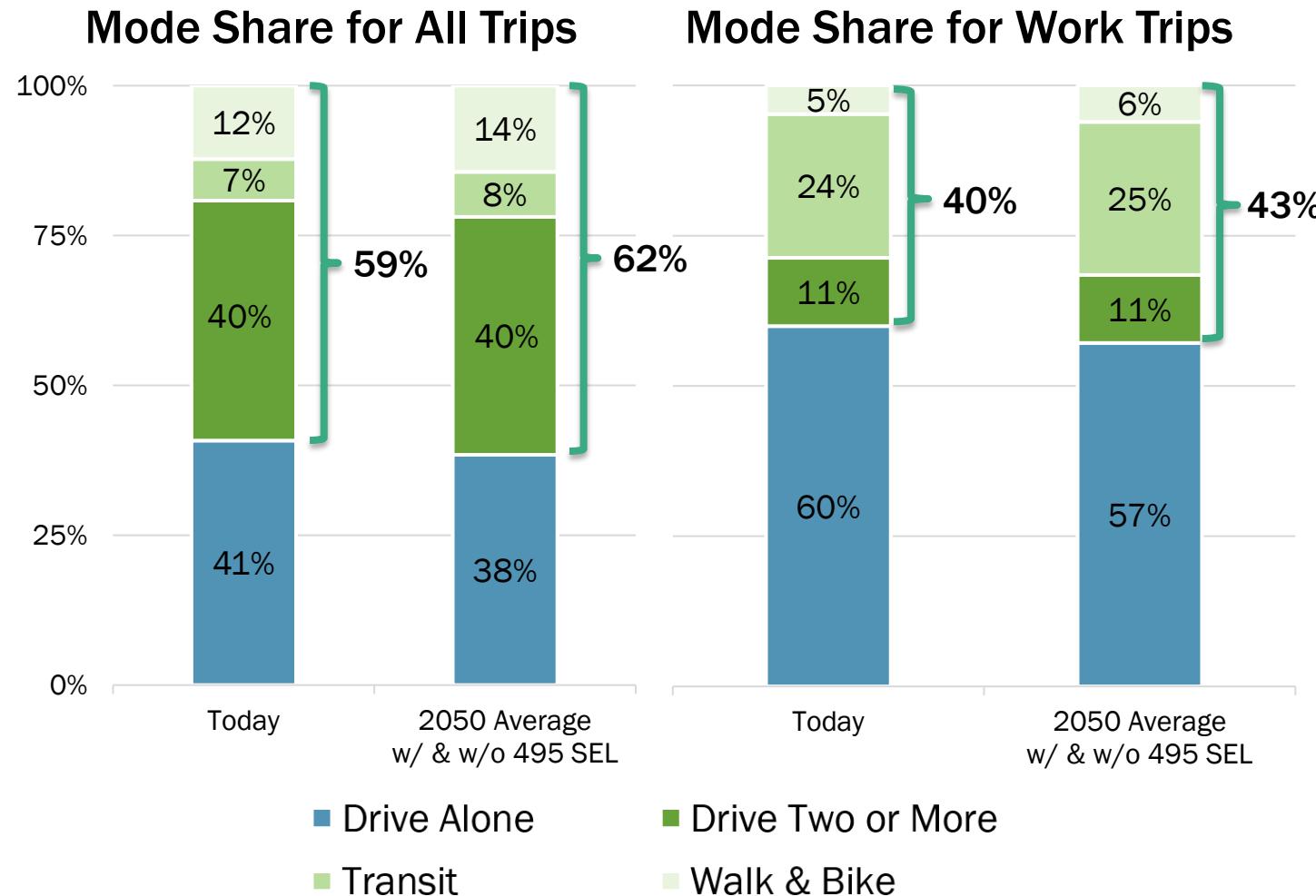
- I-495 SEL has no appreciable impact on daily VMT per capita

Change in Resident VMT, Today to 2050



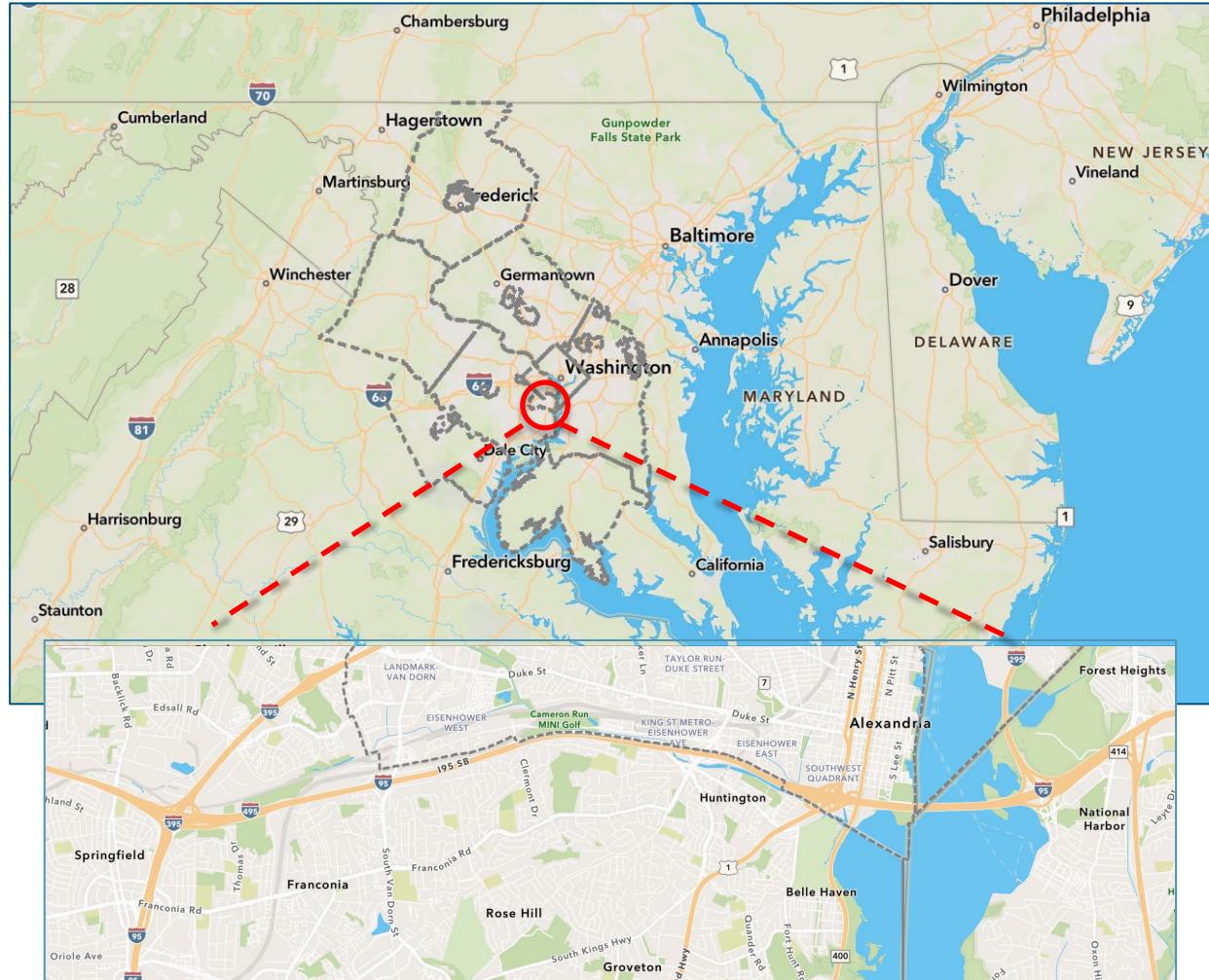
Non-Single Occupancy Travel Increases by 2050

- By 2050, share of travel on non-SOV mode increases for All Trips and Work Trips
 - All Trips: 62% non-SOV by 2050
 - Work Trips: 43% non-SOV by 2050
- Commuting will continue to be dominated by SOV travel, but **a quarter of all Work Trips will be by transit in 2050**
- I-495 SEL has no appreciable impact on regional mode choice



Wrap-up of Regional Analysis

- Future land use changes
- Almost 150 other highway and transit projects modeled
- One project will not substantially alter the regional outcomes for measures shared today
- Value of I-495 SEL not based solely on future regional metrics for air quality or system performance
- Consider overall anticipated benefits and potential burdens of new HOT3+ express lanes between Springfield and National Harbor as part of the interstate, inter-regional, and local systems



Next Steps

Next Steps

- **September 2025** (*Note: Regular meeting date will be rescheduled, date TBD*), TPB completes approval of project list for Visualize 2050 by acting on I-495 SEL
- Staff develops Visualize 2050 comprehensive document
- Staff compiles detailed results of Visualize 2050 performance assessment
- Draft Visualize 2050 document released for 30-day public comment – **tentatively, Thursday, October 9 – Friday, November 7, 2025**
- **December 17, 2025**, TPB responds to comments and adopts Visualize 2050
- Visualize 2050 submitted to US DOT (FHWA & FTA) for review and approval!

Remaining Schedule

September 2025	<ul style="list-style-type: none">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.Metropolitan Washington Air Quality Committee (MWAQC) and MWAQC Technical Advisory Committee (MWAQC-TAC) reviews draft results of AQC analysis for the updated plan and FY 2026–2029 TIP.Staff finalize the draft plan, TIP, and AQC documents, website, and advertise the comment period.
October 2025	<ul style="list-style-type: none">Public comment period on the draft plan, TIP, and the results of AQC analysis for the updated plan and FY 2026-2029 TIP (tentative dates: Thursday, October 9 – Friday, November 7, 2025).TPB, TPB Technical Committee review the draft Visualize 2050 plan, FY 2026-2029 TIP, and Air Quality Conformity Analysis Report.
November 2025	<ul style="list-style-type: none">TPB receives a summary of the comments received on the analysis, plan and TIP; the agencies sponsoring the projects will have the opportunity to provide responses to comments.
December 2025	<ul style="list-style-type: none">TPB will be asked to approve the results of the AQC analysis and adopt the Visualize 2050 plan and the FY 2026-2029 TIP.

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Transportation Planning Board

Agenda Item 4: Visualize 2050 Draft Analyses
July 2, 2025