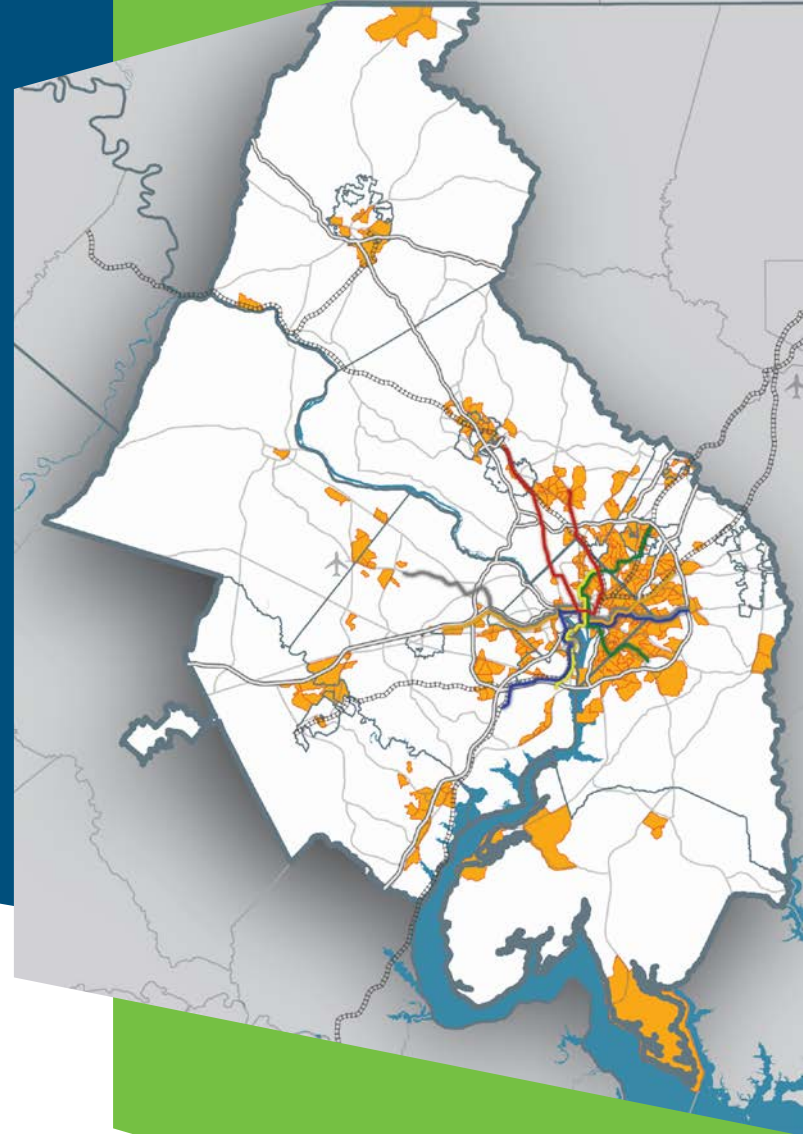


2022 Update to Visualize 2045 Air Quality Conformity Analysis and Performance Analysis

Transportation Planning Board
Travel Forecasting Subcommittee
May 20, 2022



visualize
2045

A long-range
transportation plan
for the National
Capital Region

Top 3 Things to Know about the Visualize 2045 Update

1. It meets all federal requirements, including*:

- ✓ Technical Inputs
- ✓ Fiscal Constraint
- ✓ Air Quality Conformity
- ✓ Implementation of TPB's Public Participation Plan
- ✓ Title VI
- ✓ Performance-Based Planning Requirements

2. It projects \$223.3 Billion expended for 2023-2045

- 81% must be devoted to operations and maintenance
- Modal Breakdown:
 - WMATA: 45%
 - Other public transportation: 22%
 - Highways: 32%
 - Stand-alone bike/ped: 0.4%

3. It forecasts progress on goals but also challenges

- Access to transit will increase
- More people, businesses and visitors will have increased travel options
- Growth will increase demand, increasing delay and congestion

*EJ Analysis will be conducted on the approved plan

Highlights of What's New

Applies an 'equity lens' to plan content.

Process:
More information on the planning process:
How does regional planning work?

Public Engagement:
Integrates Voices of the Region findings

Planning Areas:
• Aspirational Initiatives
• transportation modes
• future /fed planning factors including climate (CCMS)/resiliency

Projects:
Integrates project sponsor responses to regional policy questions.

Federal Compliance:
Progress discussions for the PBPP

And the plan maintains a continued focus on demonstrating federal compliance

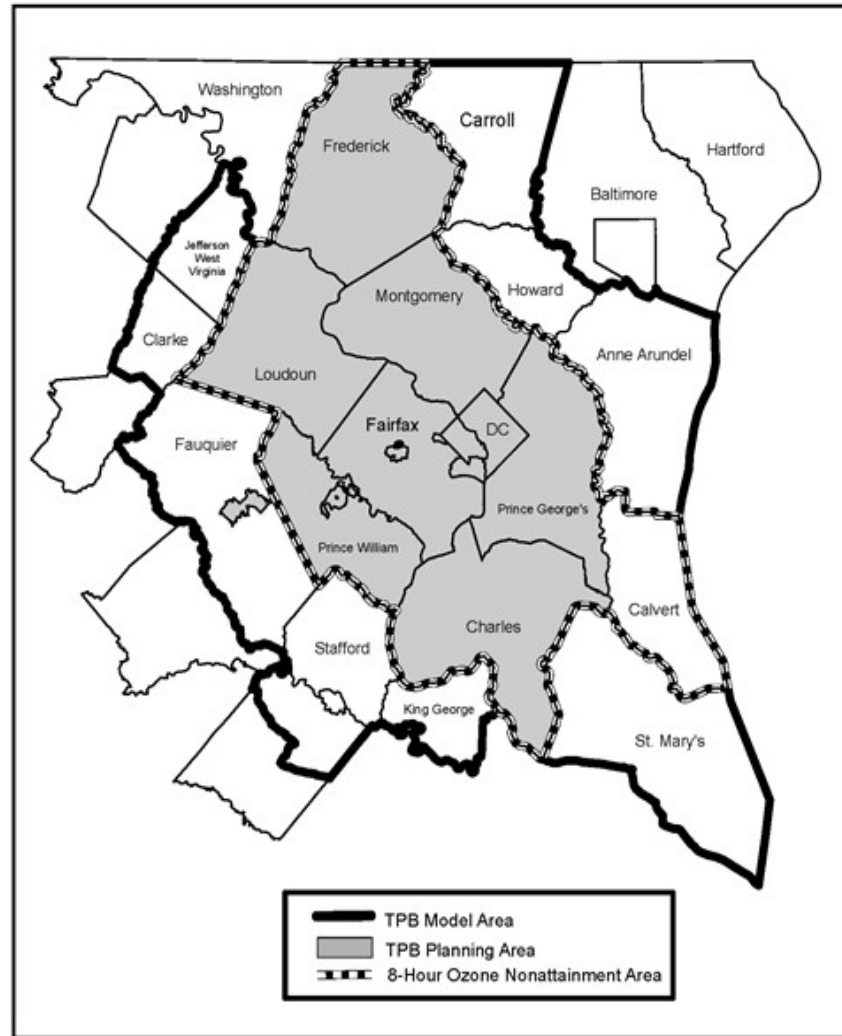
Air Quality Conformity Analysis



The 2022 Update to Visualize 2045 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.

visualize
2045

Three Geographies Used for Planning and Modeling



Technical Approach

Analysis Years:

2021, 2023, 2025, 2030, 2040, 2045

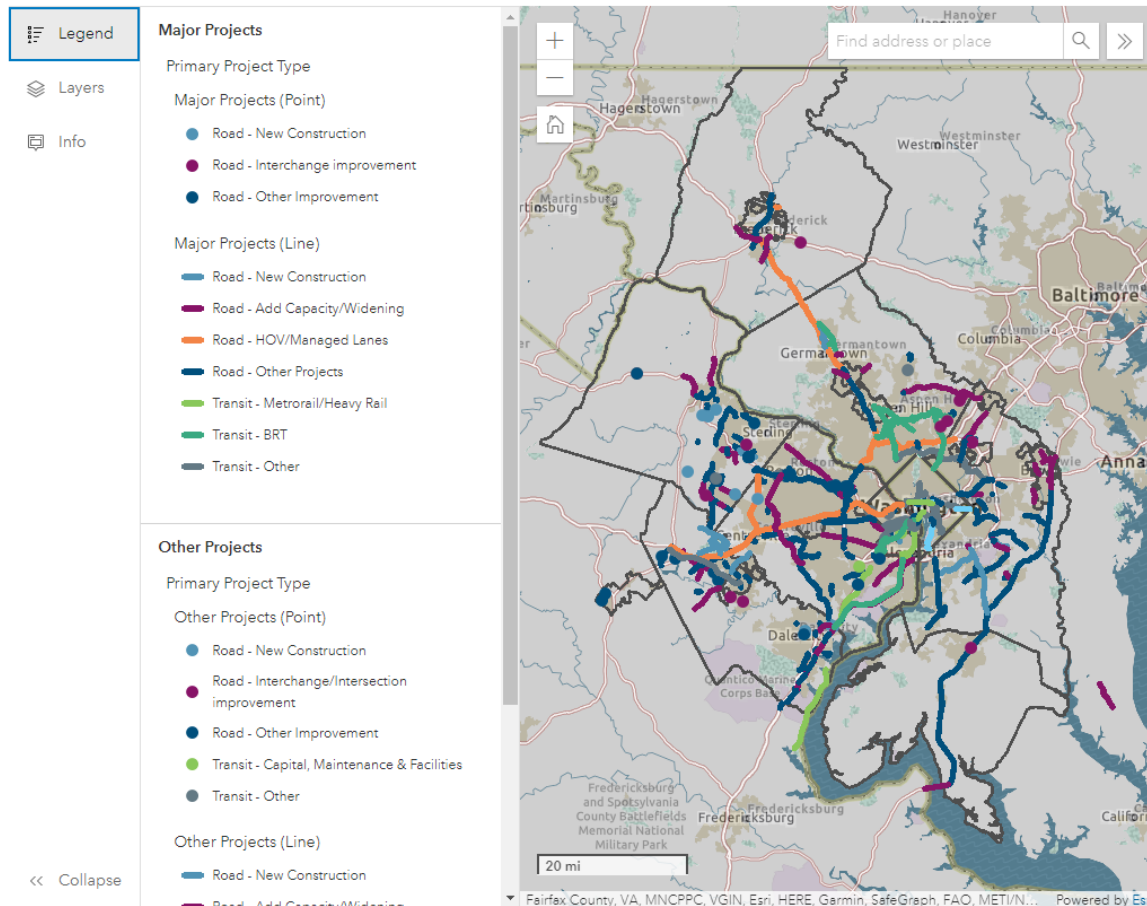
Technical Approach

Key Technical Inputs and Tools:

- ❖ Round 9.2 Cooperative Forecasts – *NEW*
- ❖ “Regionally Significant” Transportation Projects - *NEW*
- ❖ Gen2/Version 2.4 Travel Demand Model - *NEW*
- ❖ 2020 Vehicle Registration Data (VIN) - *NEW*
- ❖ EPA’s MOVES2014b Mobile Emissions Model

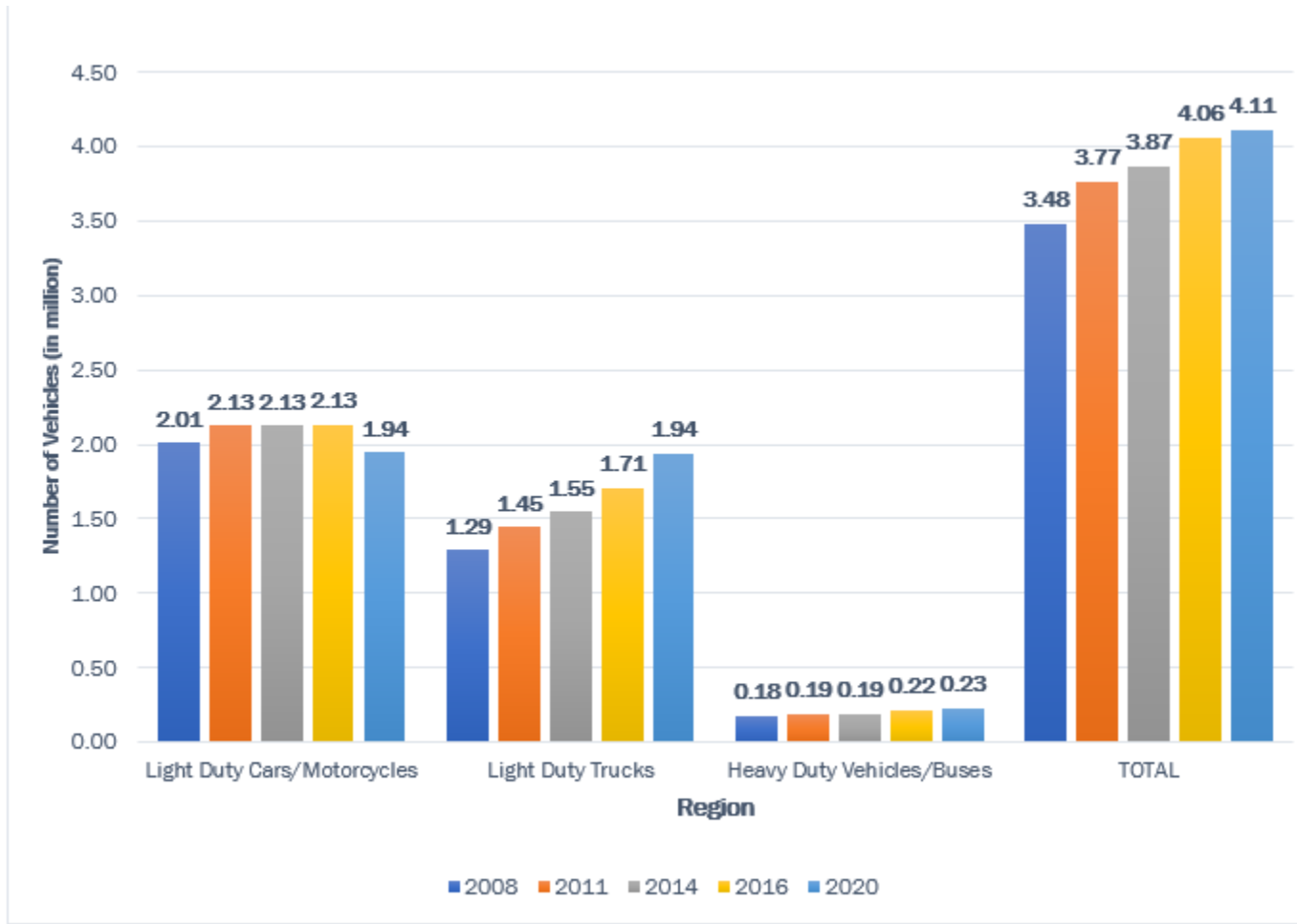
Online Projects Map

<https://www.mwcog.org/maps/map-listing/visualize-2045-project-map/>



2020 Vehicle Registration Data

Historical Growth in Vehicles by Type



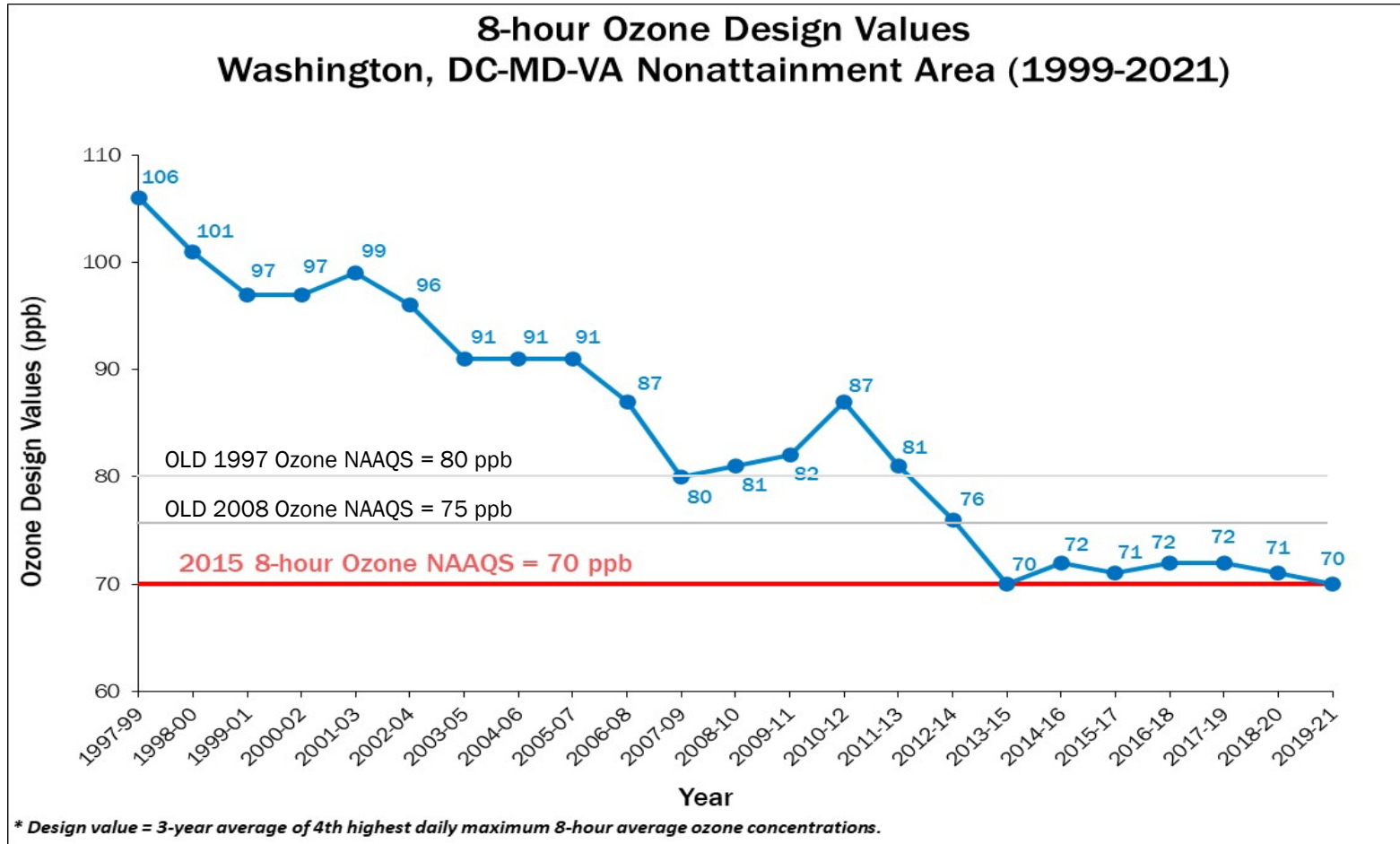
2020 Vehicle Registration Data

Average Age of Vehicle Fleet by Year

Year	Light Duty Vehicles* (LDV)	Light Duty Trucks (LDT)	Heavy Duty Vehicles (HDV)	All Vehicle Types
2008	8.51	7.53	9.21	8.18
2011	9.25	8.55	10.56	9.05
2014	9.62	9.09	11.30	9.49
2016	9.32	8.68	11.29	9.16
2020	10.05	8.74	11.51	9.51

*Motorcycles are included

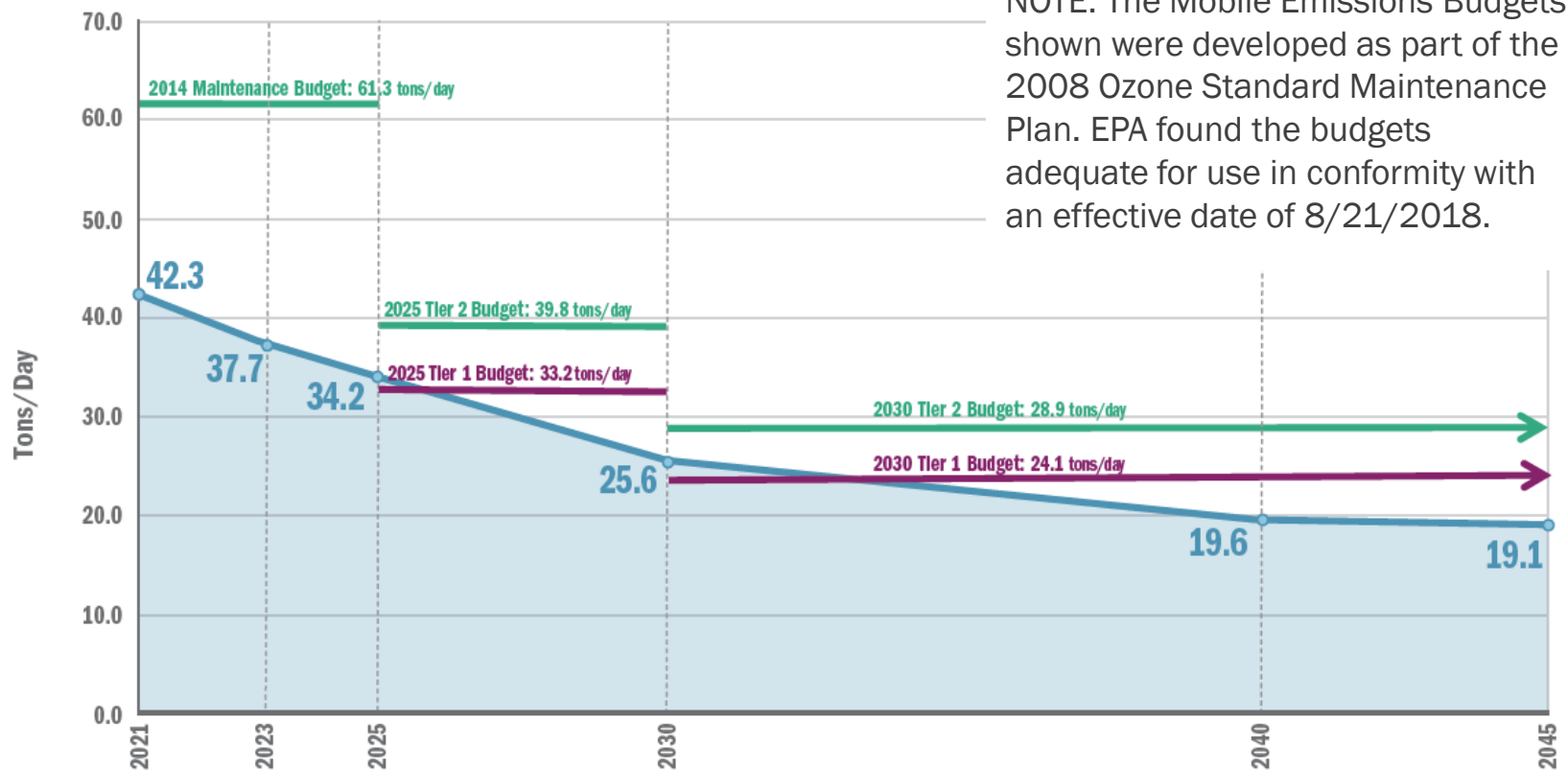
Air Quality Trend 1999-2021



Source: MWAQC Staff

Air Quality Conformity

2022 Update to Visualize 2045 Air Quality Conformity Mobile Source Emissions and Mobile Emissions Budgets Ozone Season: Volatile Organic Compounds (VOCs)

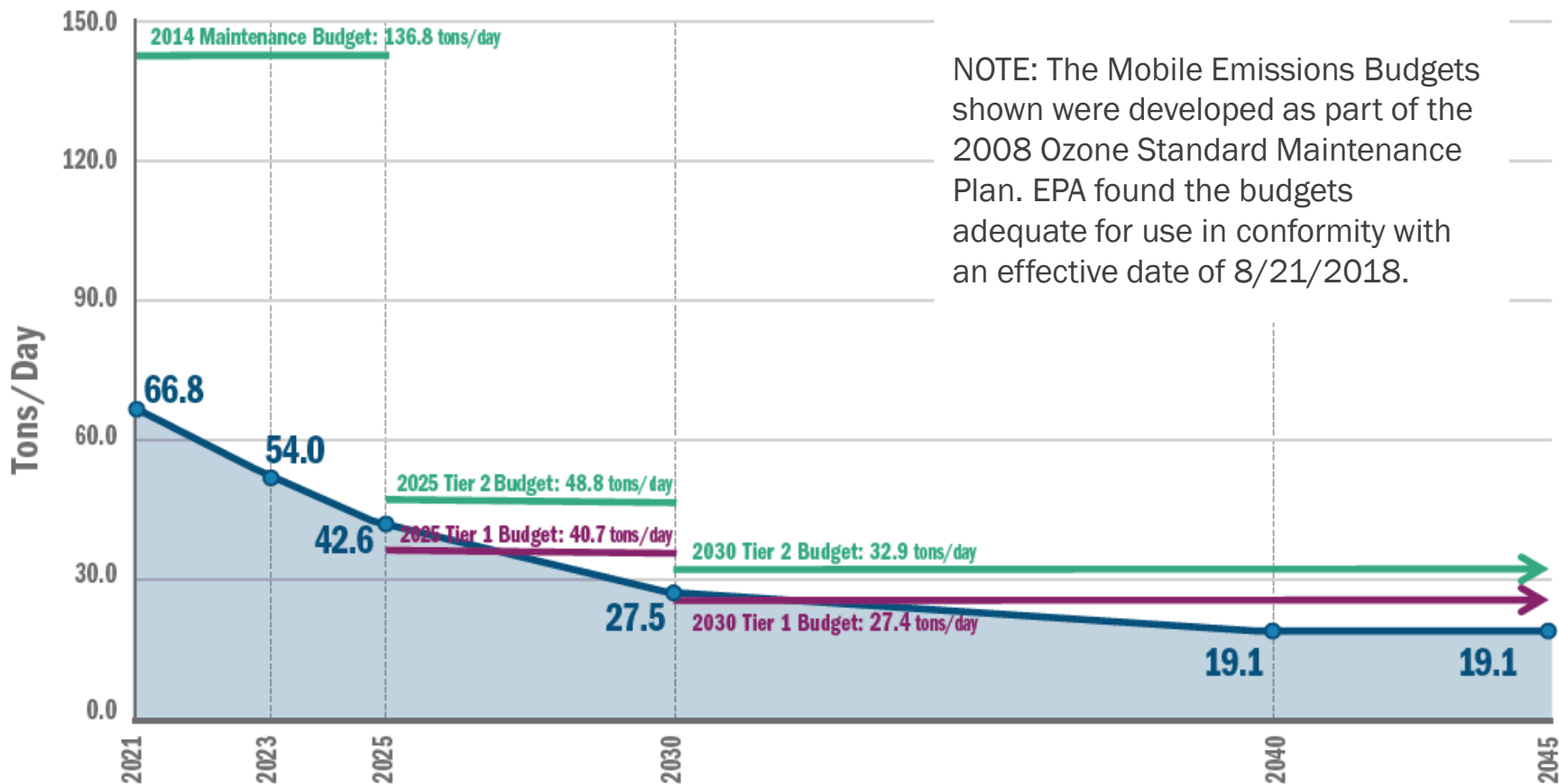


NOTE: The Mobile Emissions Budgets shown were developed as part of the 2008 Ozone Standard Maintenance Plan. EPA found the budgets adequate for use in conformity with an effective date of 8/21/2018.

Air Quality Conformity

Forecast
Data

2022 Update to Visualize 2045 Air Quality Conformity Mobile Source Emissions and Mobile Emissions Budgets Ozone Season: Nitrogen Oxides (NOx)



Air Quality Conformity: Using Tier 2 Budgets

	Maintenance SIP Mobile Budgets	2022 Update to Visualize 2045 Conformity Emissions
Cooperative Forecasts	Round 9.0	Round 9.2
Vehicle Fleet	2014 VIN	2020 VIN
Travel Demand Model	Gen2/Version 2.3.66	Gen2/Version 2.4
Project Inputs	2016 CLRP	2022 Update to Visualize 2045
Metrorail Constraint	yes	no

Files Available

Model Transmittal Package Available

July 2022

Performance Analysis

Performance Results and the TPB Policy Framework

The TPB measures performance as one way of tracking progress on the goals and priorities presented in the TPB Policy Framework

The Evolution of the TPB Policy Framework

1998



2010



2014



2018



Key Takeaways

- Access to transit will continue to grow, providing an important alternative.
- The region is forecast to make progress towards many of its goals—despite demand from growth, and limited funds for transportation enhancements.
- More people, businesses, and visitors will have more travel options which is reflected in forecast mode share.

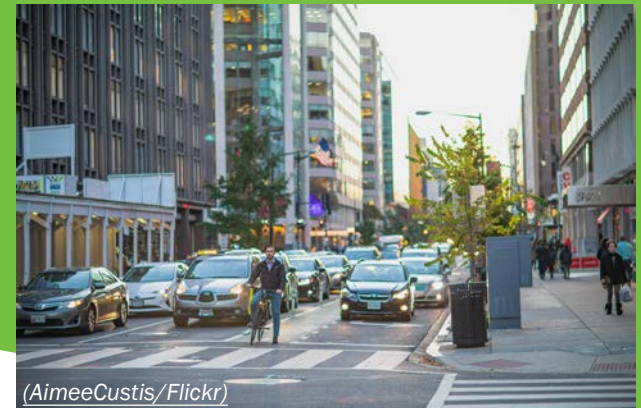


Key Takeaways (cont.)

- Expected growth will likely increase demand, increasing delay and congestion and reducing job access by auto for some parts of the region.
- Financial obligations to maintain and operate the existing system limits expansions and enhancements.
- Future uncertainties will impact the region between now and 2045.



Photo by DDOT



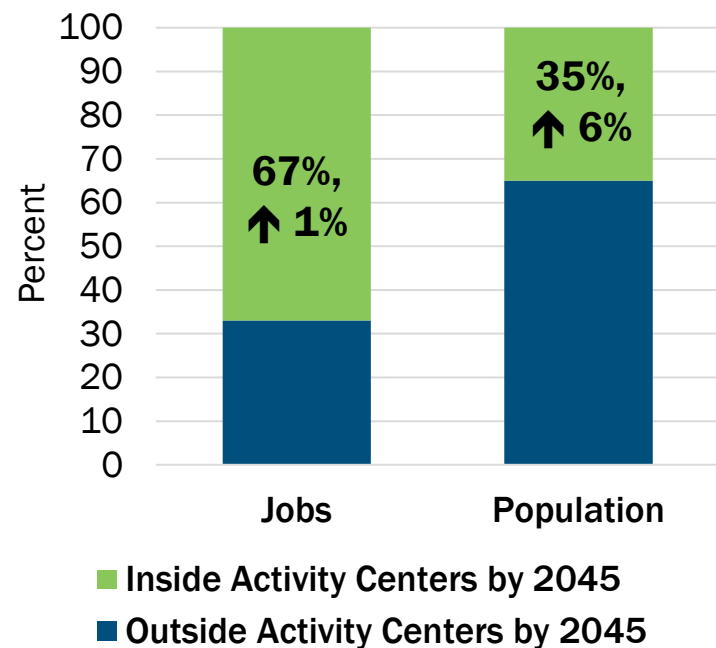
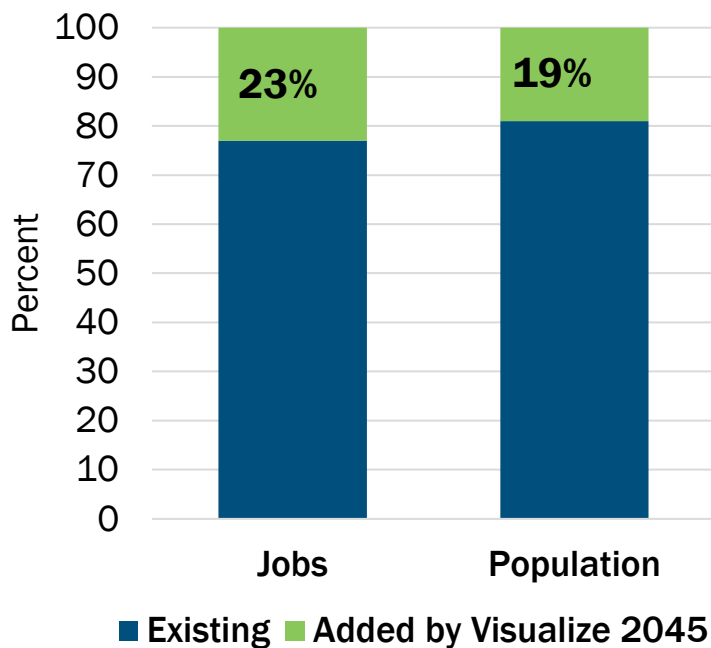
(AimeeCustis/Flickr)

Regional Growth and Policy Context

The Region Will Continue To Grow...

About 80% of 2045 land-use is already in place.

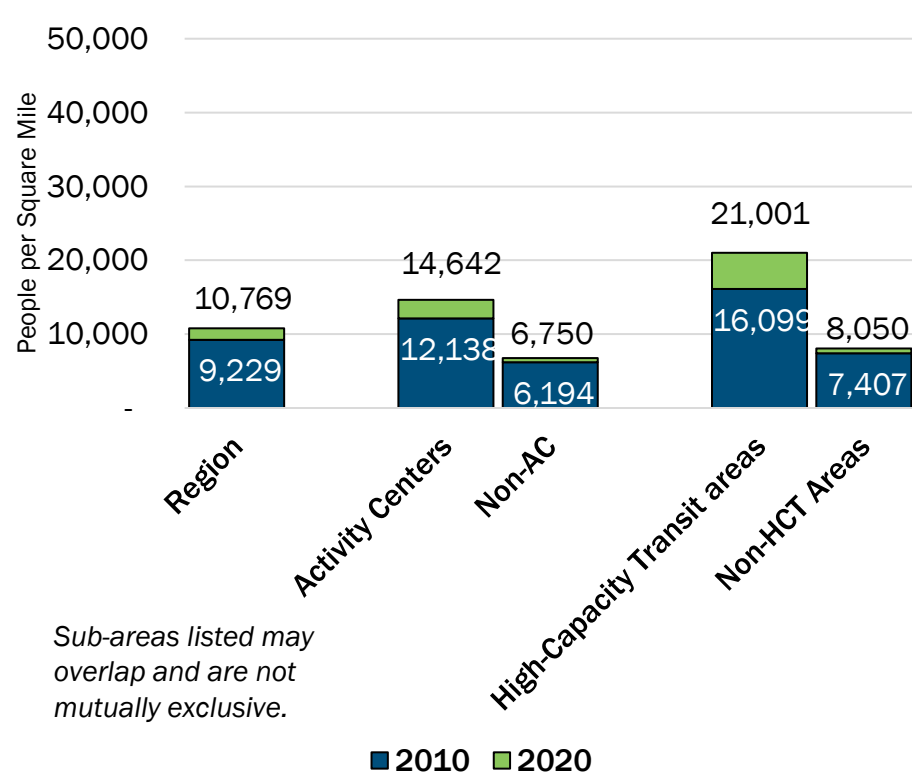
With more people and jobs, the transportation systems will need to continue handling its current and forecasted demand. Activity Centers will contain 67% of jobs (up from 66%) and 35% of the population (up from 29%)



Note: Staff analysis of U.S. Decennial Census Block Groups

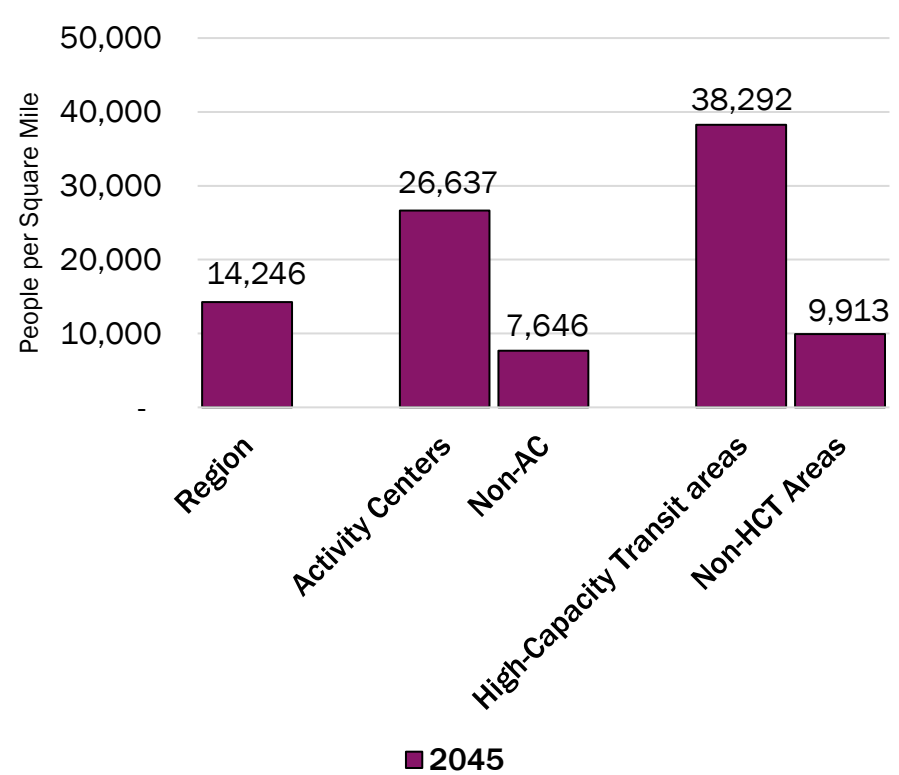
...and Increase in Density

Evidence suggests the region is making progress towards goal to concentrate land-use in the right areas, like Activity Centers and High-Capacity Transit areas.



Sub-areas listed may overlap and are not mutually exclusive.

Note: Staff analysis of U.S. Decennial Census Block Groups



Note: Staff analysis of COG Cooperative Forecast Transportation Analysis Zones



By 2045, More than 1/4 of People and 1/2 of Jobs will be Close to High-Capacity Transit

% of Population and Jobs in Proximity to High-Capacity Transit

	Today	2045	
People	18%	27%	↑26%
Jobs	41%	49%	↑25%

Proximity:

0.5-mile radius from High-Capacity Transit

High-Capacity Transit:

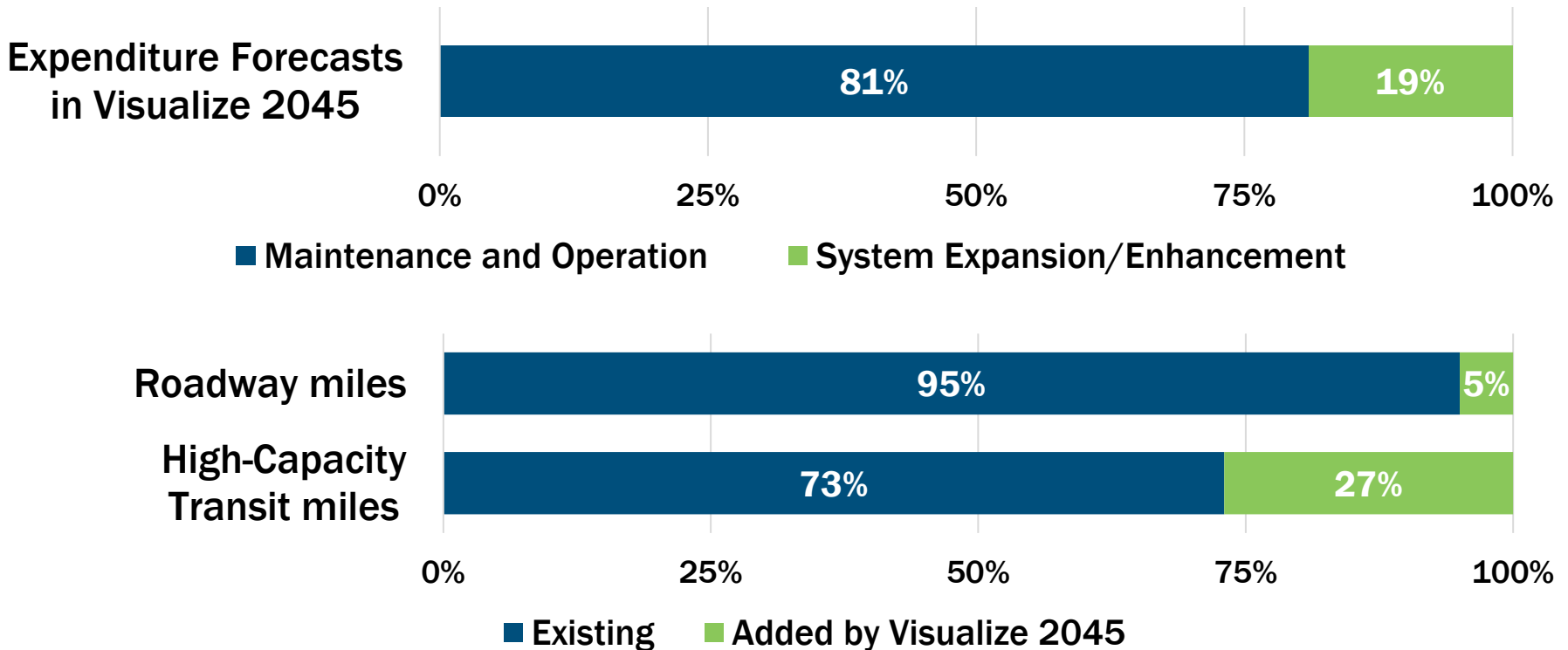
- Metrorail
- Commuter Rail
- Streetcar
- Light Rail
- Bus Rapid Transit



Funding for Expansion is Limited

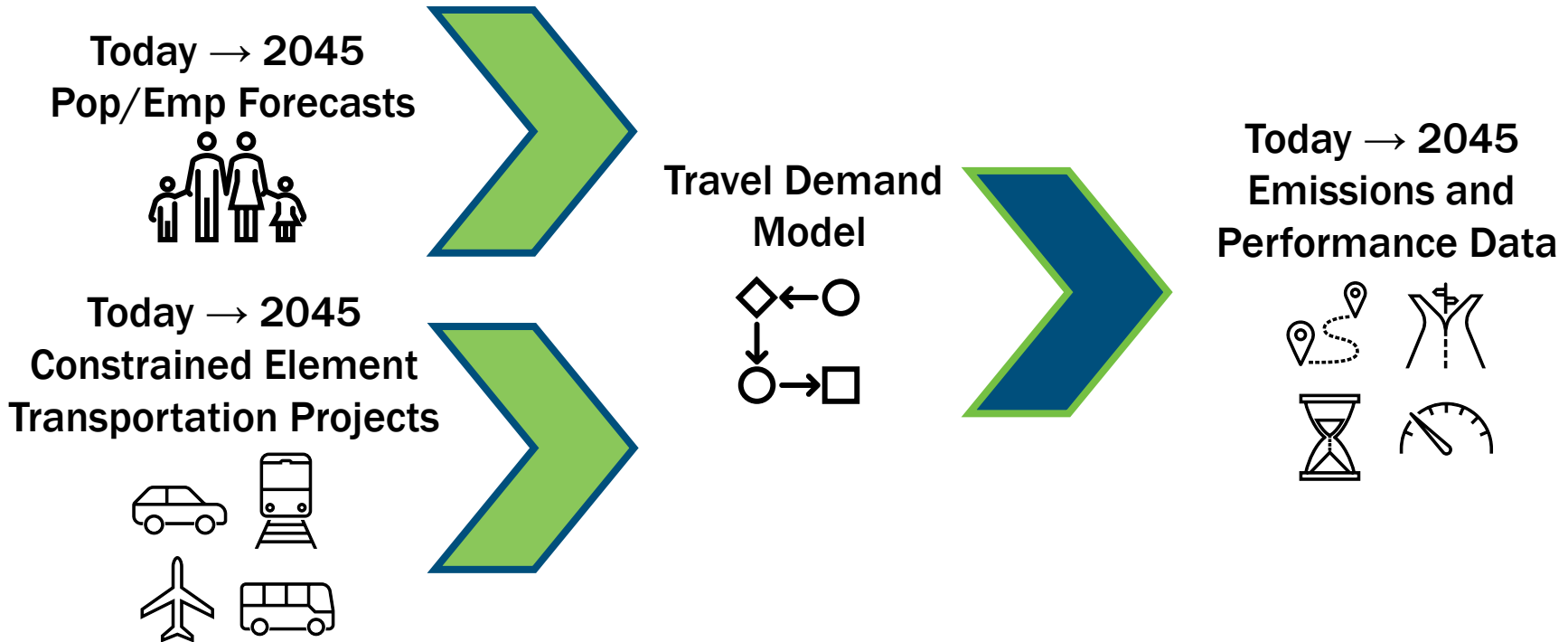
Of the \$223.3 Billion Year of Expenditure dollars in Visualize 2045, only 19% is available for the type of system expansion and enhancement projects that advance our shared goals.

Resulting in an additional 5% of roadways and 27% of High-Capacity Transit.



Conducting the performance analysis of Visualize 2045

Travel Demand Model Forecasts the Impact of Changes to Land-use and Transportation



- Round 9.2 Cooperative Forecasts
- Gen2/Version 2.4 Travel Demand Model
- Analysis of TPB Planning Area
- 2020 Vehicle Registration Data
- EPA's MOVES 2014b Mobile Emissions Model
- Other source noted on corresponding slide

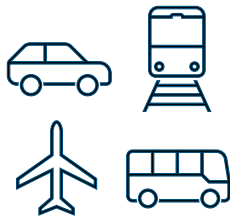
Three Scenarios

Scenarios enable us to isolate for the impact of the new set of transportation projects, programs, and policies.

Today (2023)

Today's households and jobs

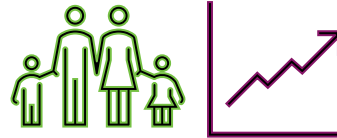
Transportation projects on the ground in 2023



2045 No Build

Forecast growth for 2045 households and jobs

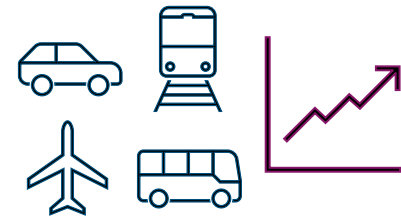
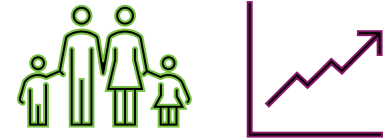
No new transportation projects beyond 2023



2045 Planned Build

Forecast growth for 2045 households and jobs

All transportation projects built by 2045

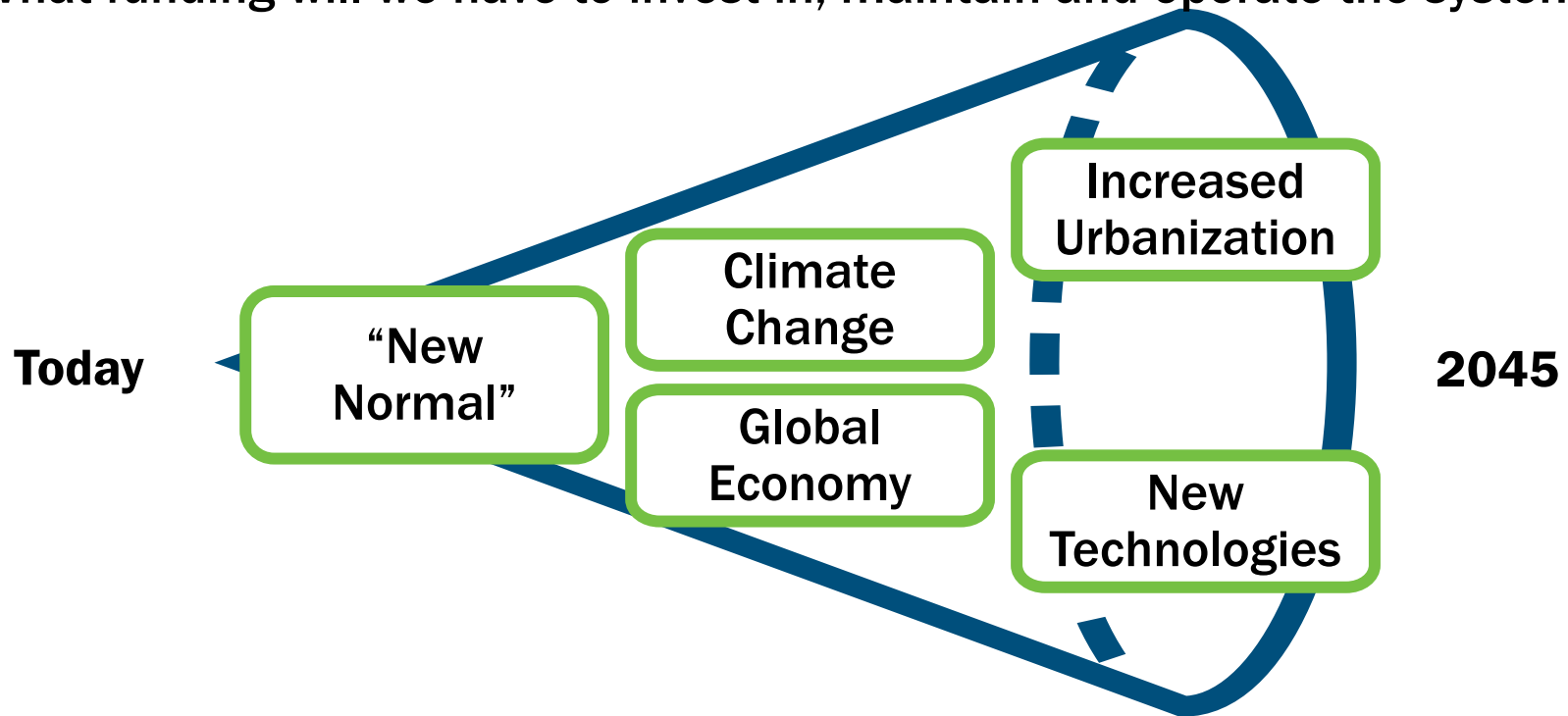


Planning Uncertainties that Will Likely Impact the Future of Travel

Where will the people and jobs be?

How will people travel?

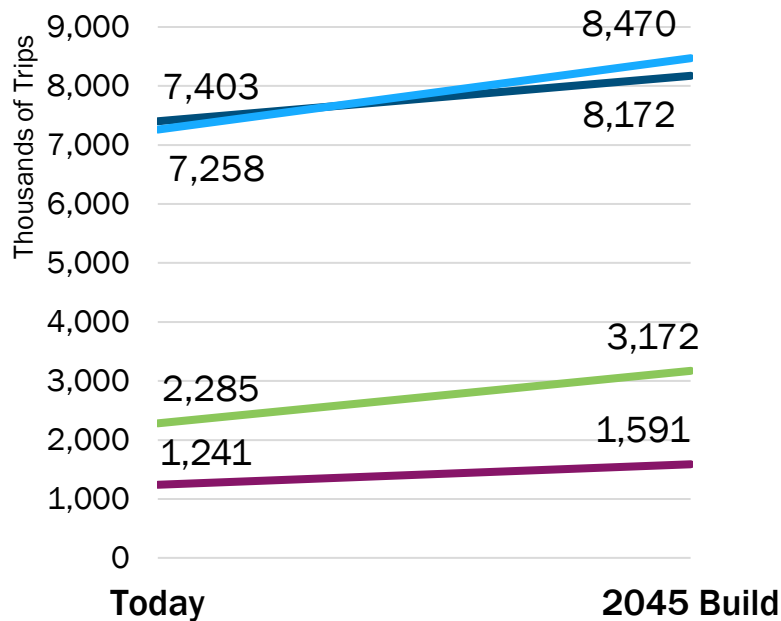
What funding will we have to invest in, maintain and operate the system?



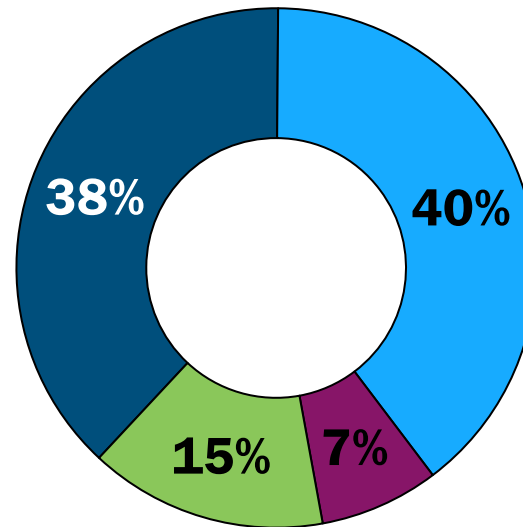
How is travel
expected to change
in the region over
time?

Region Continues to be Auto Dependent

Looking at All Trips, **HOV and carpool** expected to be more common than **driving alone**.
 Percent increase in **Walk and Bicycle** is greater than any other Mode.



Mode Share, 2045 Build



— SOV
 — HOV and Carpool
 — Transit
 — Walk and Bike

Single Occupancy Vehicle - SOV
 High Occupancy Vehicle- HOV

Avoiding Congestion and Delay: More Travel on Reliable Modes

Travel in the region on reliable modes that are represented by the Aspirational Initiatives will increase from **11% to 15%**. These options are less impacted by congestion and delay.



“Reliable modes:”

- Metrorail, Commuter Rail, Light Rail, Streetcar
- Express toll lanes with dynamic toll rates
- HOV lanes
- Inter-County Connector
- Dulles Airport Access Road
- Bus Rapid Transit
- Long-haul express buses
- Bike/Ped travel

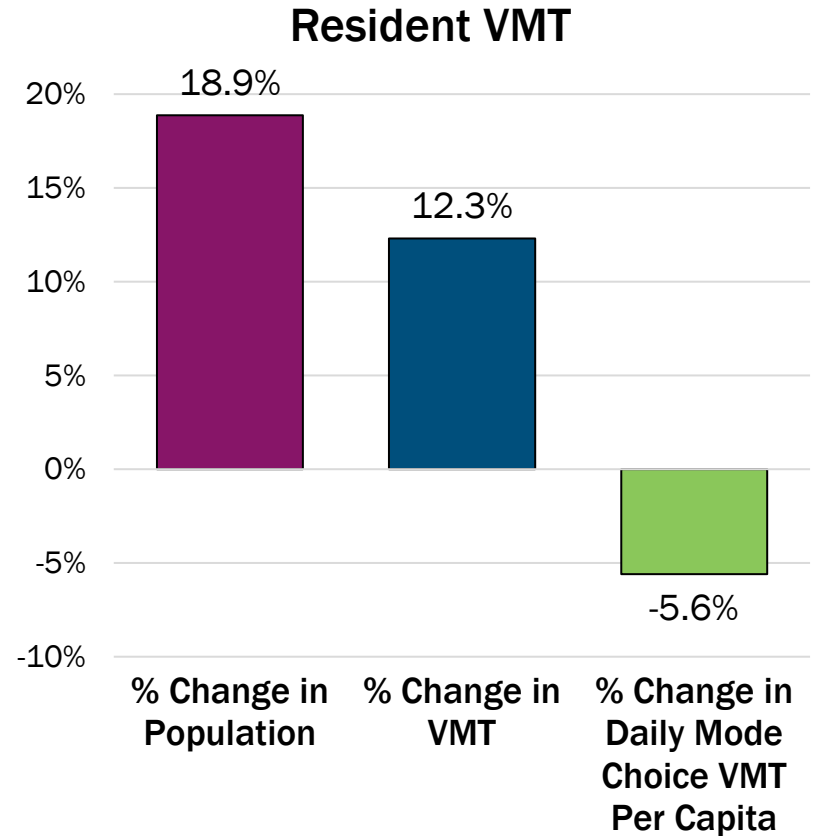
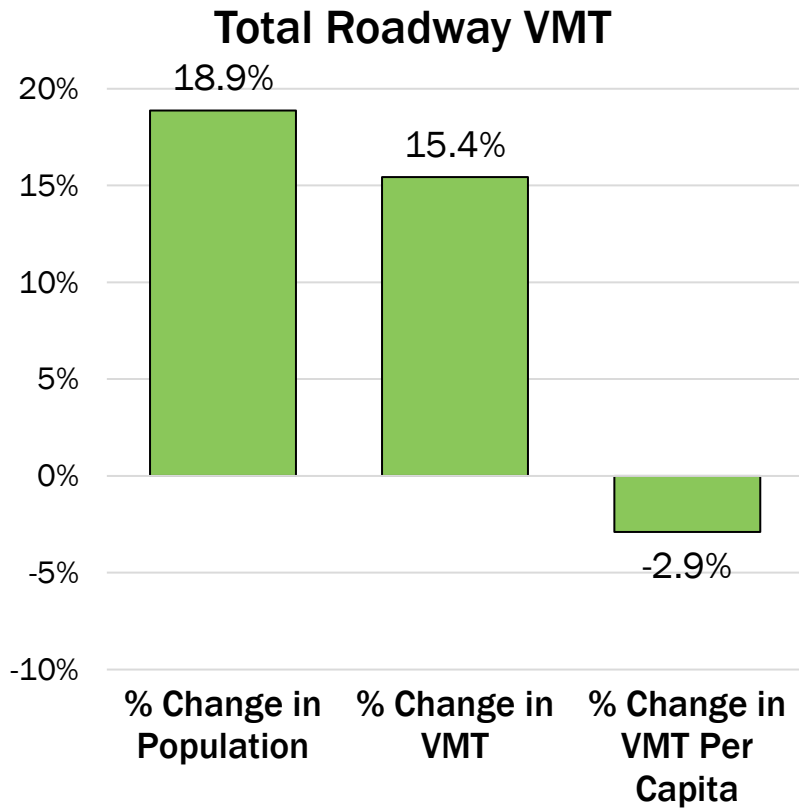


(BeyondDC/Flickr)



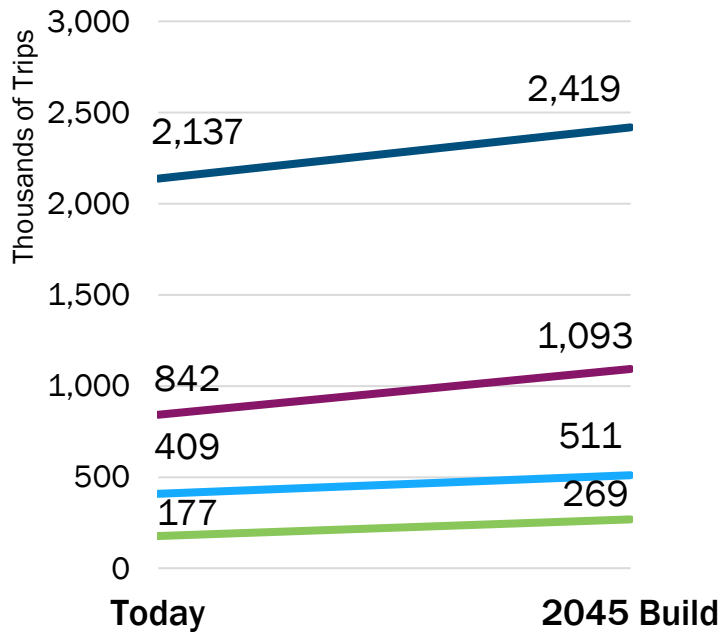
Driving in the Region to Decline Per Capita

VMT per capita of region residents declines by more than 5%. Residential vehicle use has the most potential for change compared to other uses, such as commercial.

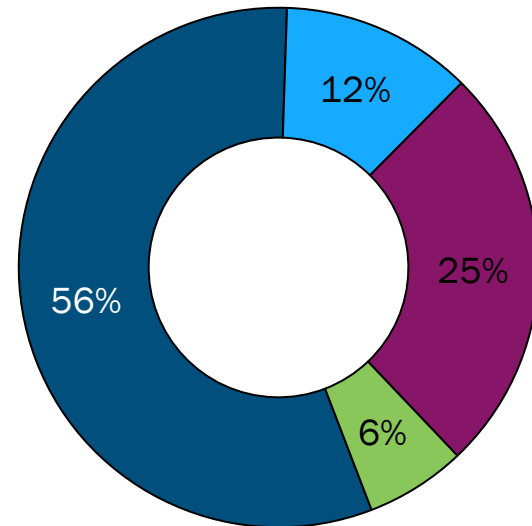


How does the plan
support traveling to
work?

Most of Work Trips will be Driving Alone, 1/4 of Work Trips on Transit



Mode Share, 2045 Build



— SOV
— Transit
— HOV and Carpool
— Walk and Bike

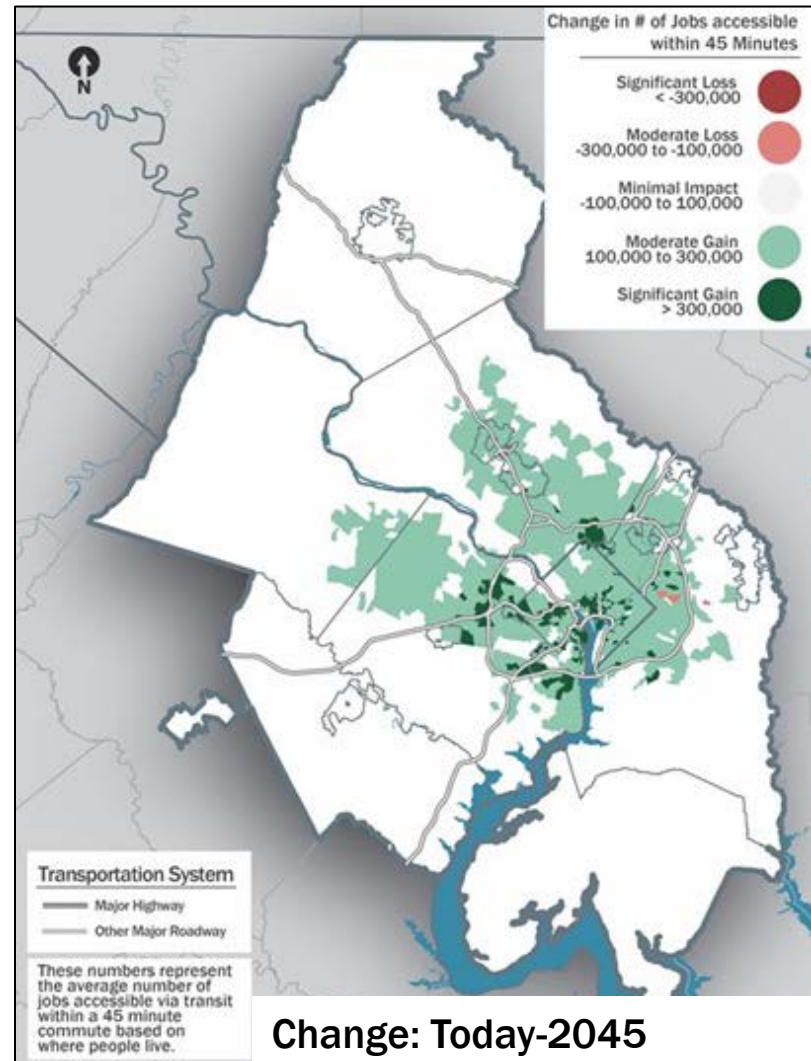
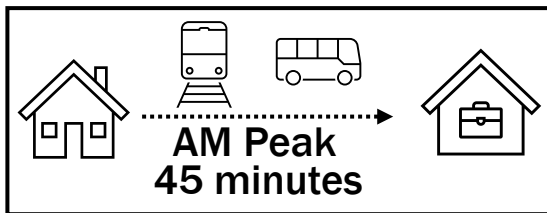
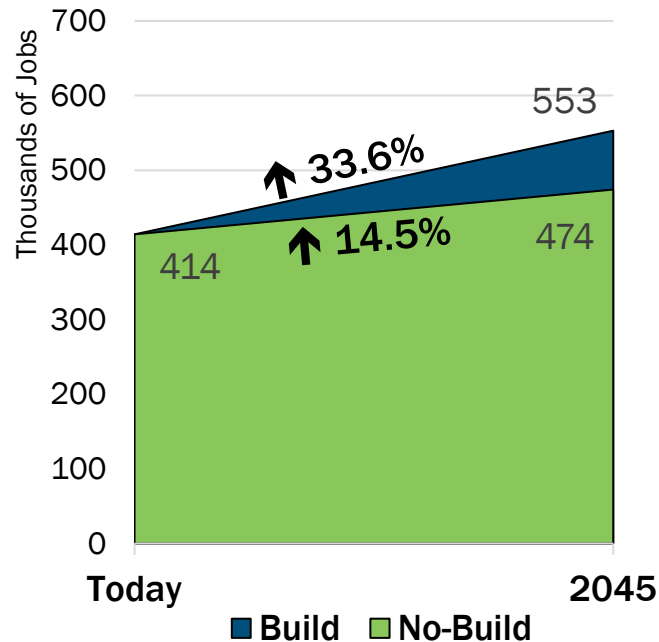
Taking Transit to Work Increases When Readily Available & Serving Density

By 2045, in the Region's Core, majority of work trips will be on transit (53%) and nearly a quarter in the Inner Suburbs, compared to 6% in Outer Suburbs



How are new transit projects forecast to impact the region?

Change in Access to Jobs, Transit

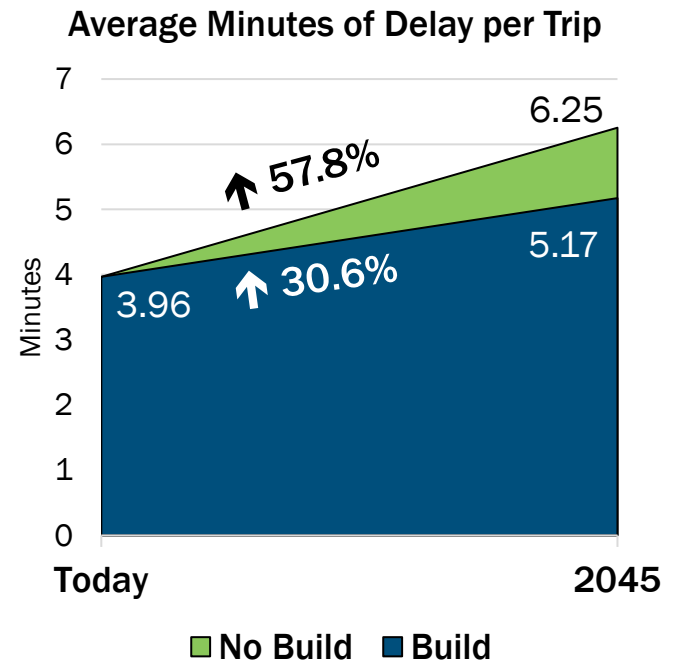
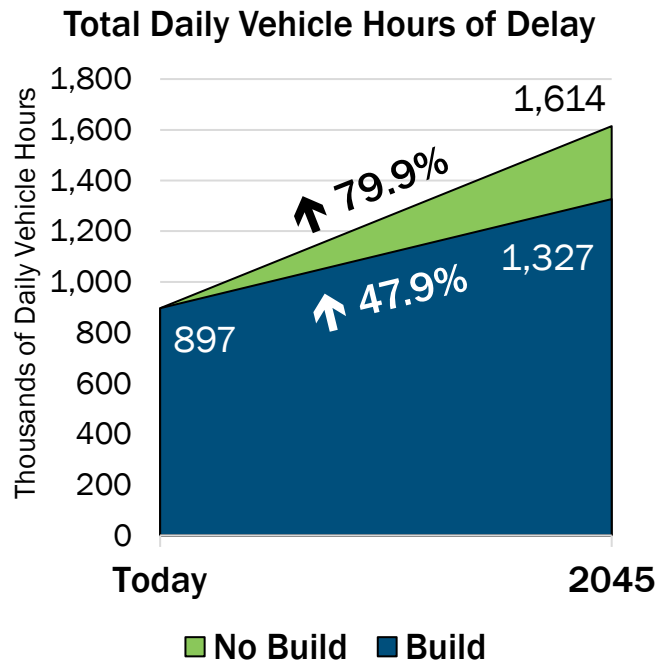


Change: Today-2045

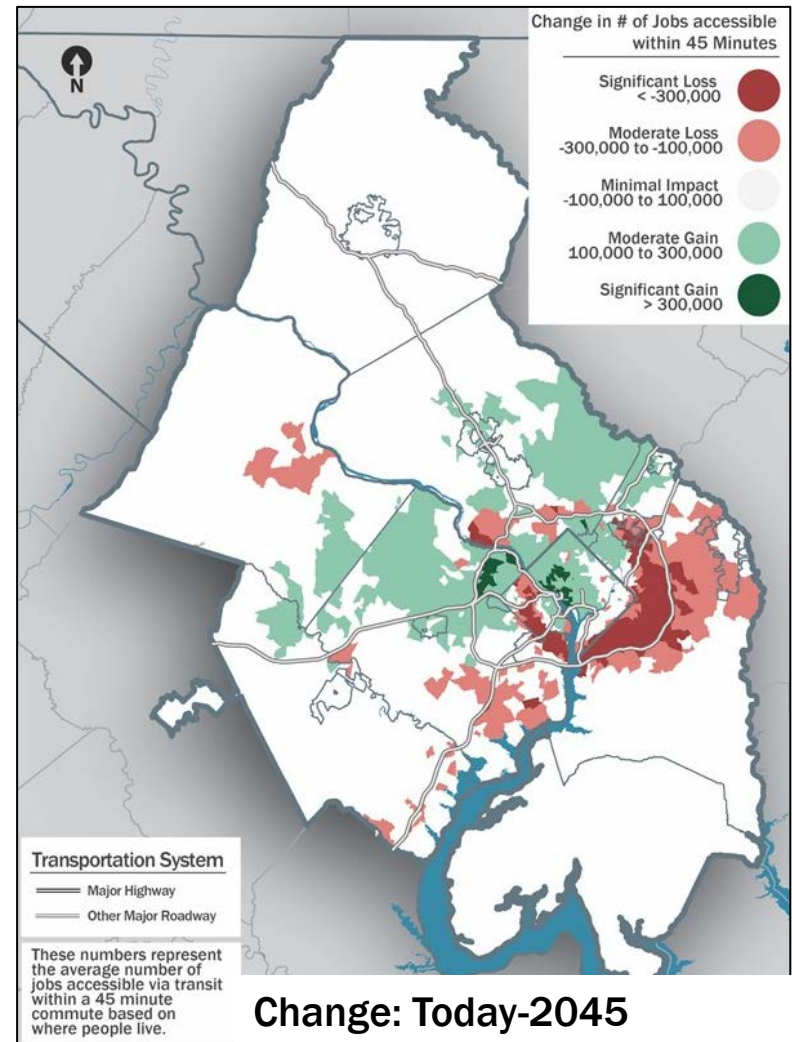
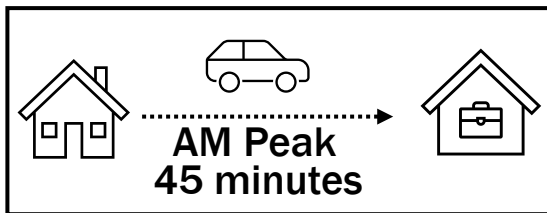
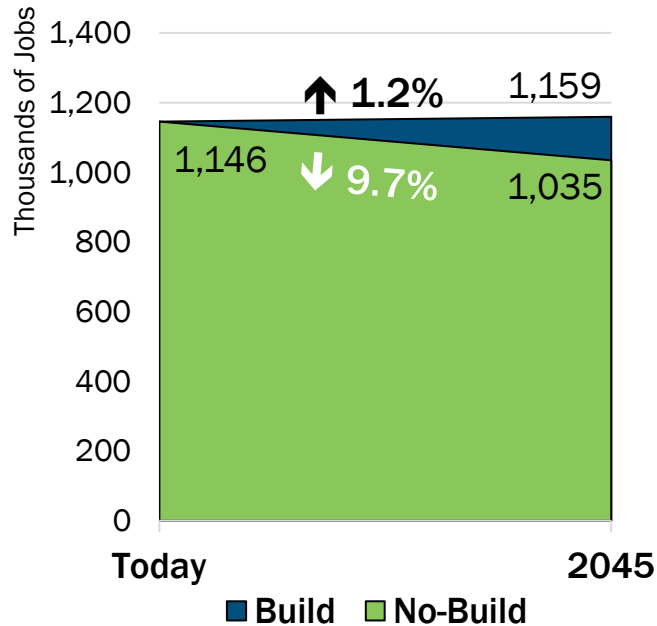
How will the
highway network
serve the region?

Delay and Congestion Continue Impacting the Region

New roadway projects will make a difference, but delay and congestion will continue to be a part of life in this region.



Change in Access to Jobs, Auto



Forecast Greenhouse Gases

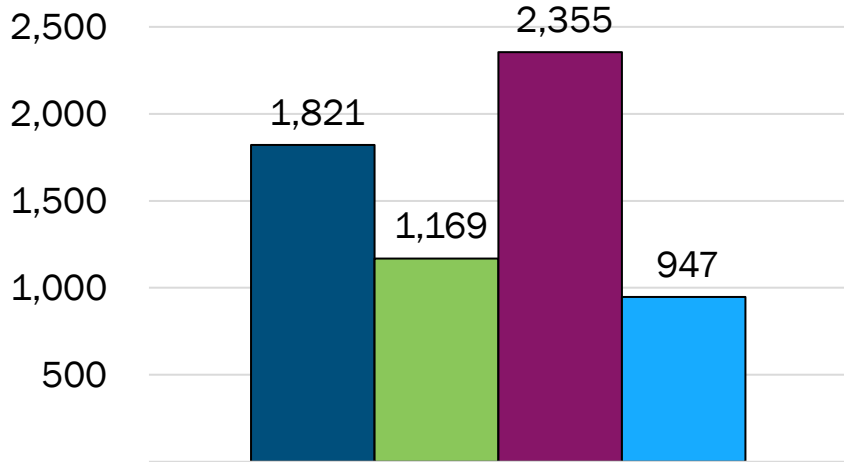
Greenhouse Gas Mobile Source Emissions CO₂e and CO₂e Per Capita



*NOTE: 2005 and 2012 are historic estimates.

Proximity to Traffic, Today

Average Traffic Proximity and Volume

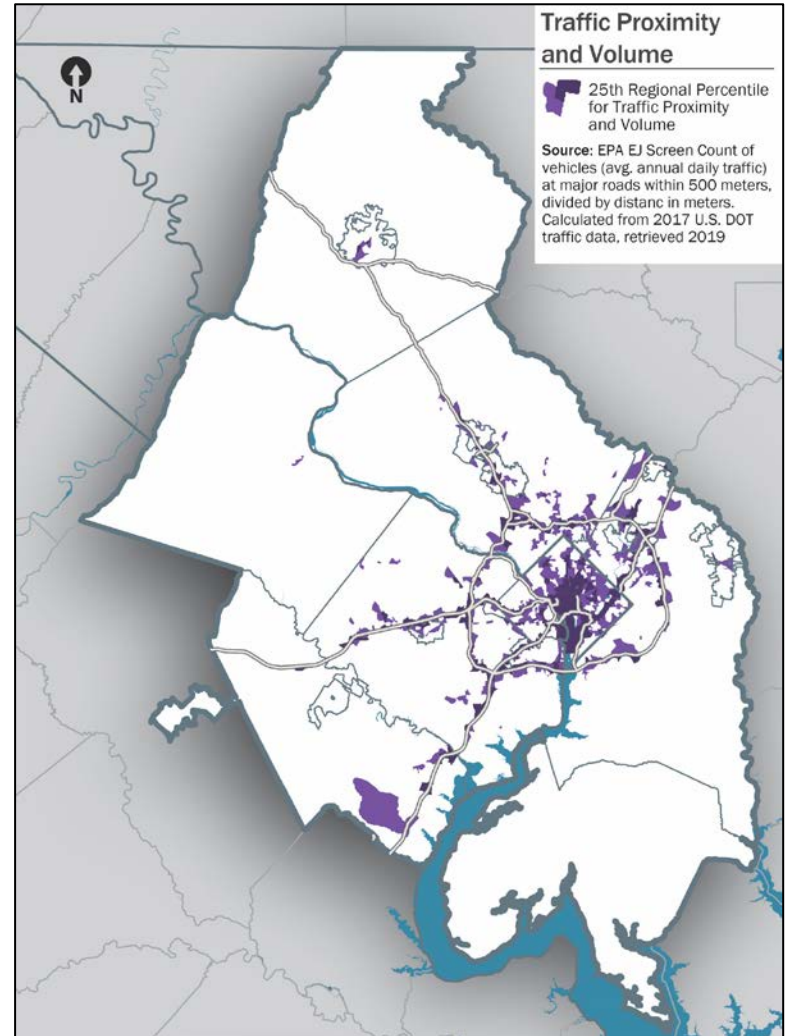


Count of vehicles per day at major roads within 500 meters divided by distance

- Equity Emphasis Areas
- Non-Equity Emphasis Areas
- Activity Centers
- Non-Activity Centers

Note: Sub-areas listed may overlap and are not mutually exclusive.

Source: EPA EJ Screen



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