

# Visualize 2045

## Highlights from the Draft Plan

Transportation Planning Board  
September 21, 2018

Item 8



# Introduction

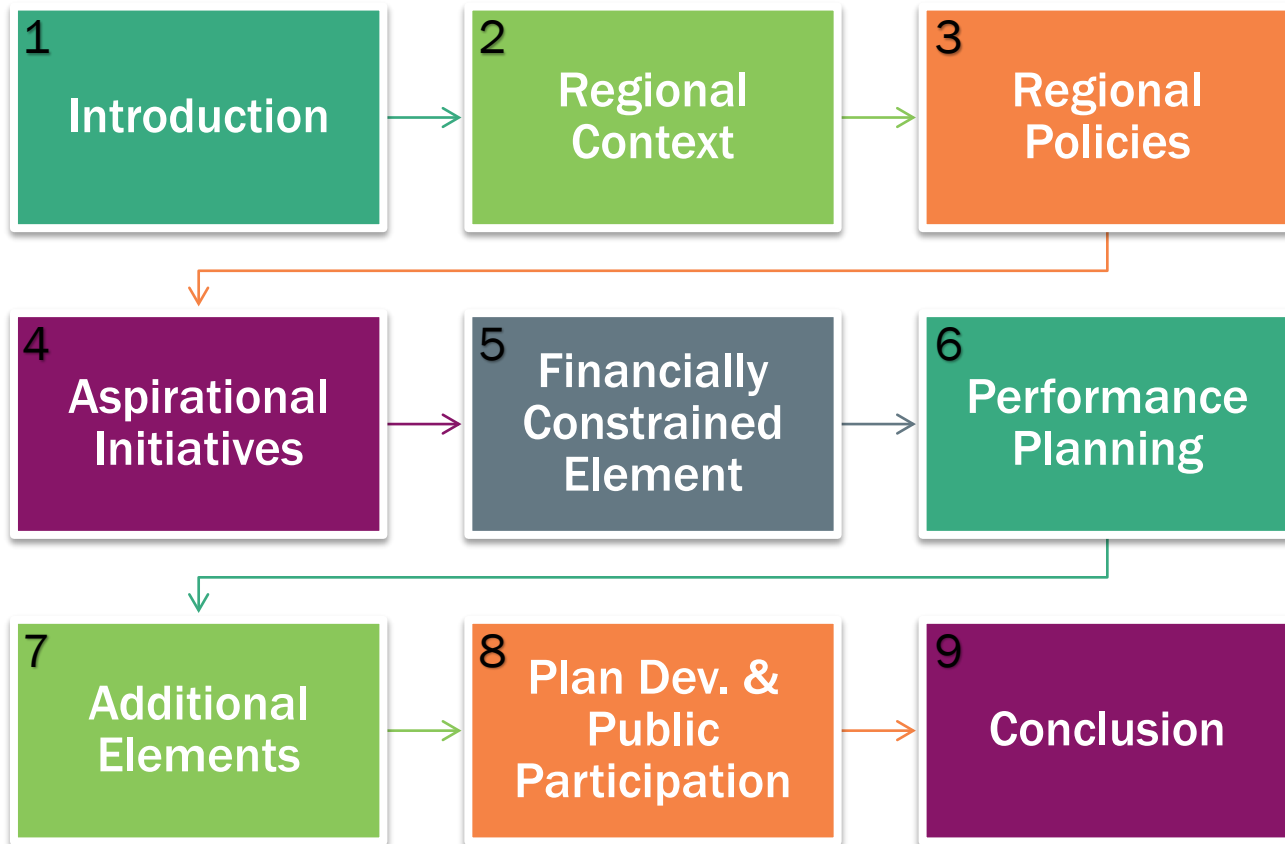
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Visualize 2045 aims to help decision makers and the public “visualize” the region’s future by illustrating:

- What the region **aspires to do** if more resources were available,
- What the region **can do** with current levels of funding and,
- What the region **must do** to meet federal requirements



# Overview



# Appendices\*

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- Appendix A Financial Plan
- Appendix B Summary of Projects in the Financially Constrained Element
- Appendix C Air Quality Conformity Analysis Summary
- Appendix D System Performance Report
- Appendix E Congestion Management Process Federal Compliance and Impact on Plan Development
- Appendix F Safety Planning
- Appendix G Environmental Consultation and Mitigation
- Appendix H Report on Phase 1 of Public Outreach: Public Input Survey
- Appendix I Report on Phase 2 of Public Outreach: Public Forums and Open Houses
- Appendix J Summary of Public Comment Periods

\*Available online at [visualize2045.org](http://visualize2045.org)



# Transportation Planning Board

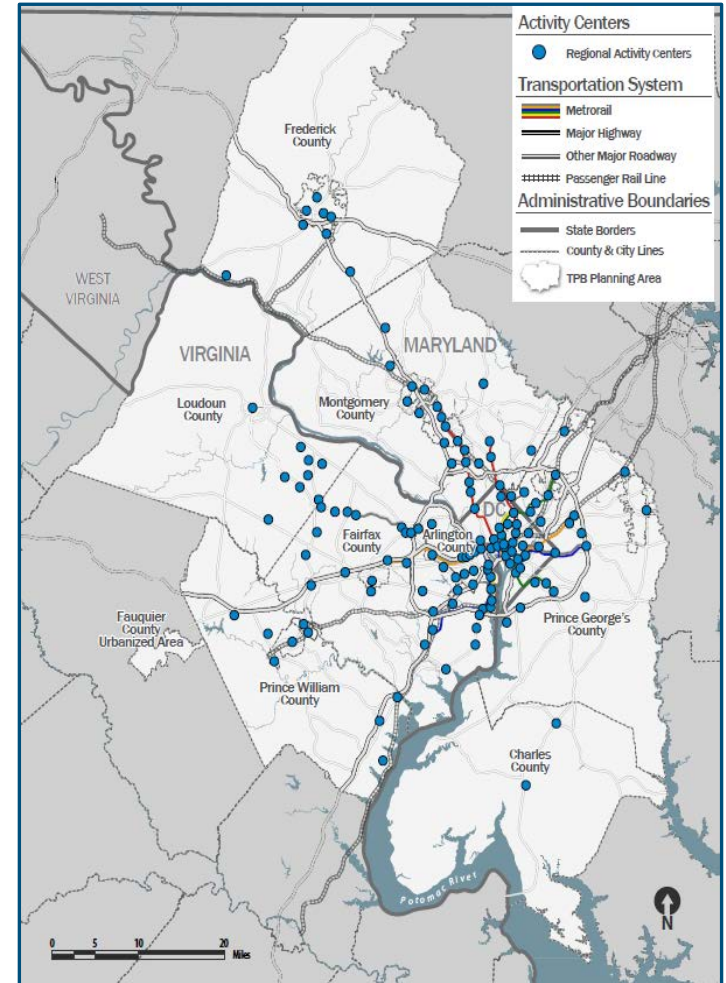
- The designated metropolitan planning organization (MPO) for the Washington region
- 23 local jurisdictions
- 44 members, 38 of which are voting members

(mariordo59/flickr)



# Our Region

- Approx. 3,500 square miles
- 5.7 million people
- 3.3 million jobs
- 141 Activity Centers



# Our Transportation System

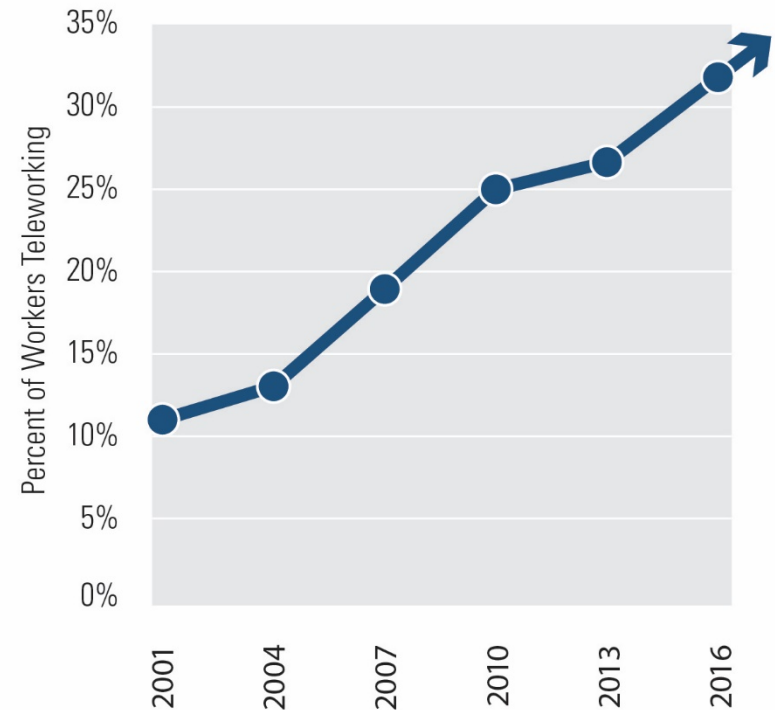
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- More than 17,000 lane miles of highways and major roads
- 118 miles of Metrorail and 91 Metrorail stations
- 167 miles of MARC and VRE commuter rail and 39 commuter rail stations
- Six miles of bus rapid transit, light rail and streetcars
- Over 500 of miles of off-street paved trails and paths for walking and biking and over 200 miles of bike lanes
- Over 15 local and commuter bus systems and over 10 paratransit service providers



# Transportation Trends - Highlights

- The rate of single occupancy vehicle trips has been declining in favor of other modes, although:
  - 41% of all trips are people driving alone
  - 61% of work trips are people driving alone
- Telework, ride-hailing apps, bikeshare (docked and dockless) all on the rise





# Forecast Population Growth

- Population is forecast to grow by 23% between now and 2045
  - 5.7 million people today
  - 6.9 million people in 2045 (approx. 1.2 million more people)
- While the projected rate of growth varies for each jurisdiction, the regional core will grow at the highest rate (35%), followed by the outer suburbs (28%), then inner suburbs (17%)
- Fairfax County and the District of Columbia are forecast to gain the most residents, each planning to grow by over a quarter-million people



# Population Growth (Today - 2045)

Existing population and forecast population growth



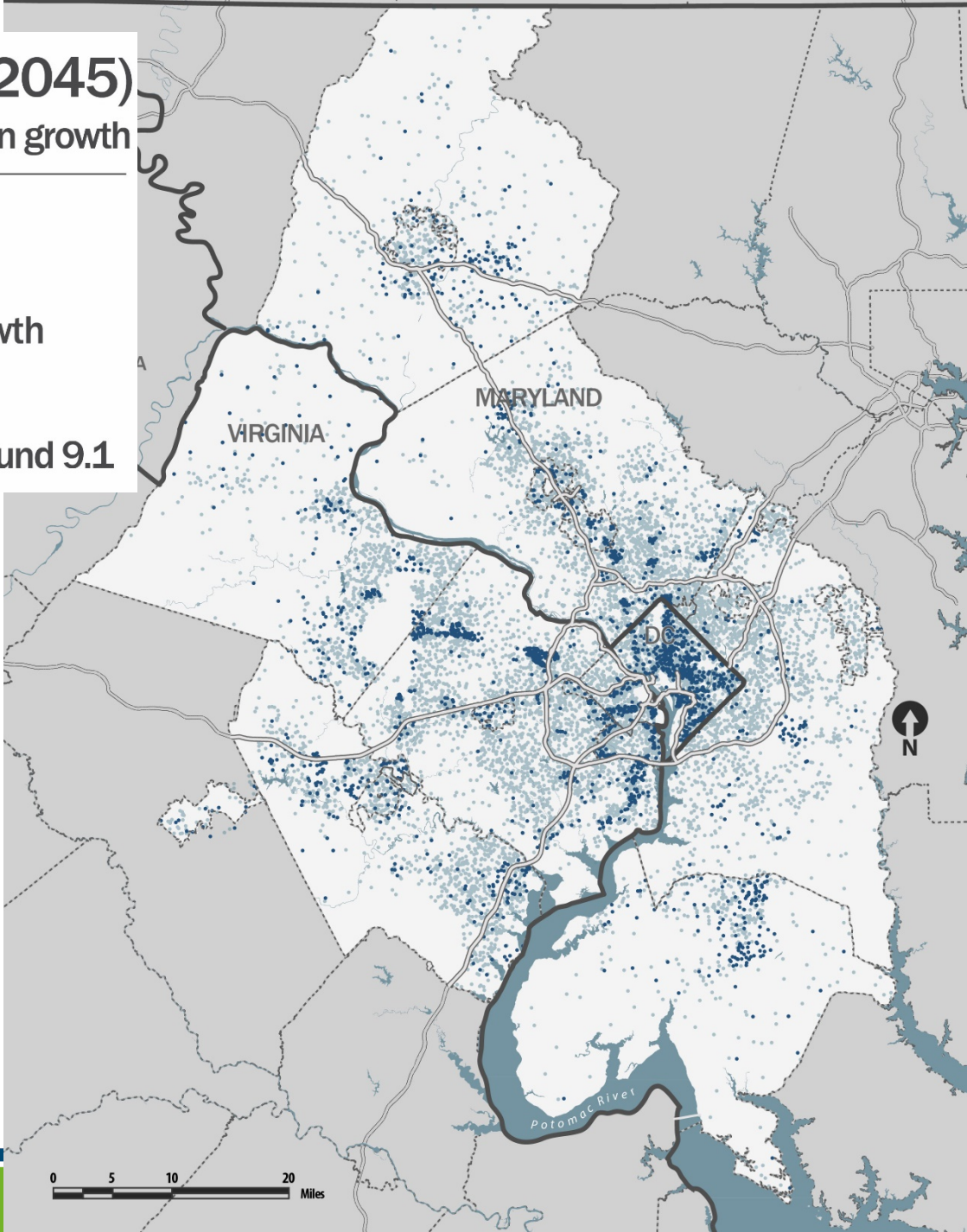
Today Existing Population



2045 Forecast Population Growth

1 dot = 500 People

Source: MWCOG Cooperative Forecast Round 9.1



# Forecast Job Growth

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- Regional employment expected to grow 29% between today and 2045
  - 3.3 million jobs today
  - 4.3 million jobs in 2045 (approx. 1 million more jobs)
- Growth is distributed throughout the region, however growth is forecast to be higher on the western side
- Fairfax County and the District of Columbia are forecasted to have the most jobs gained, while the highest rates of job growth are forecasted in Loudoun and Prince William Counties



# Job Growth (Today - 2045)

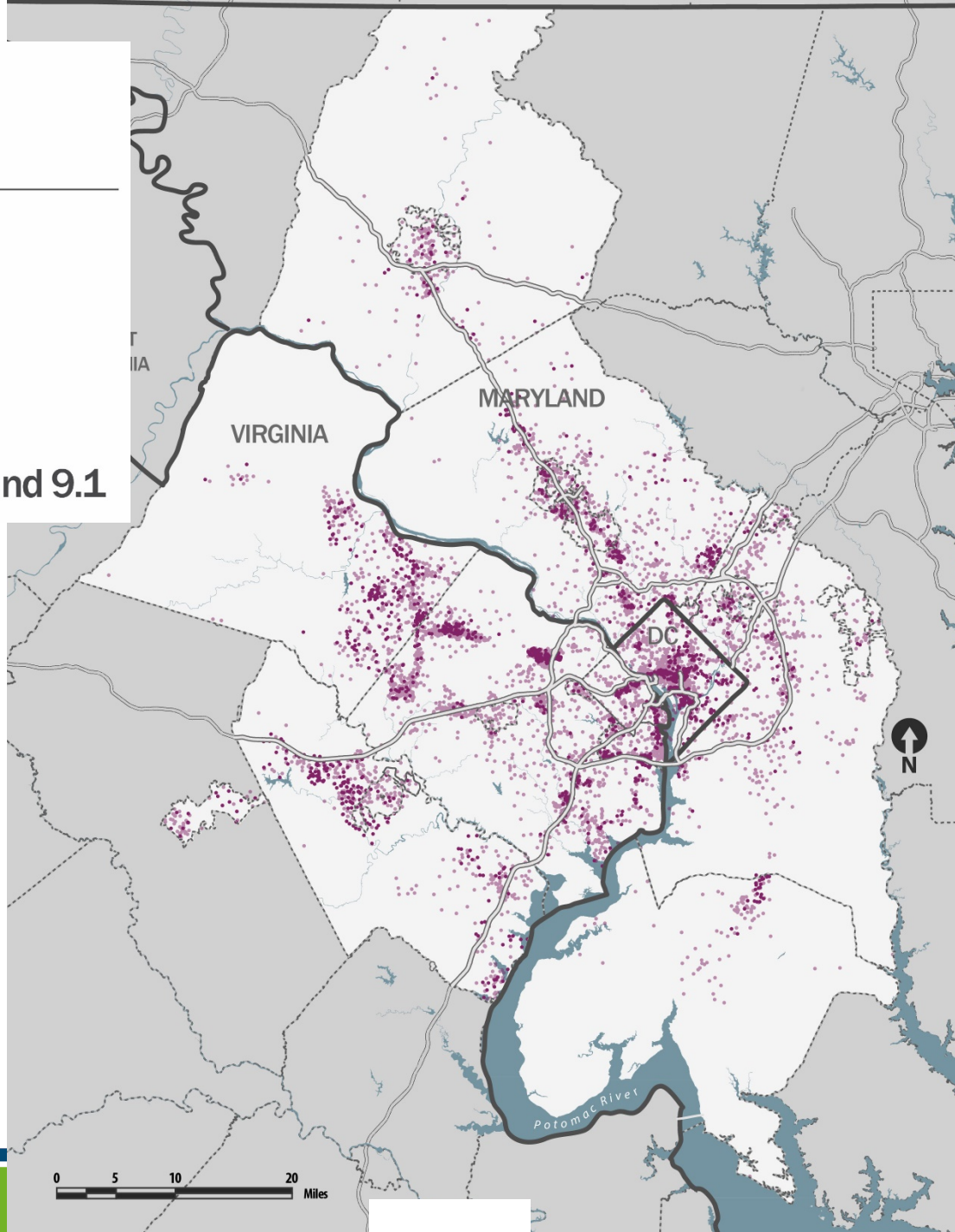
Existing jobs and forecast job growth

 Today Existing Jobs

 2045 Forecast Job Growth

1 dot = 500 Jobs

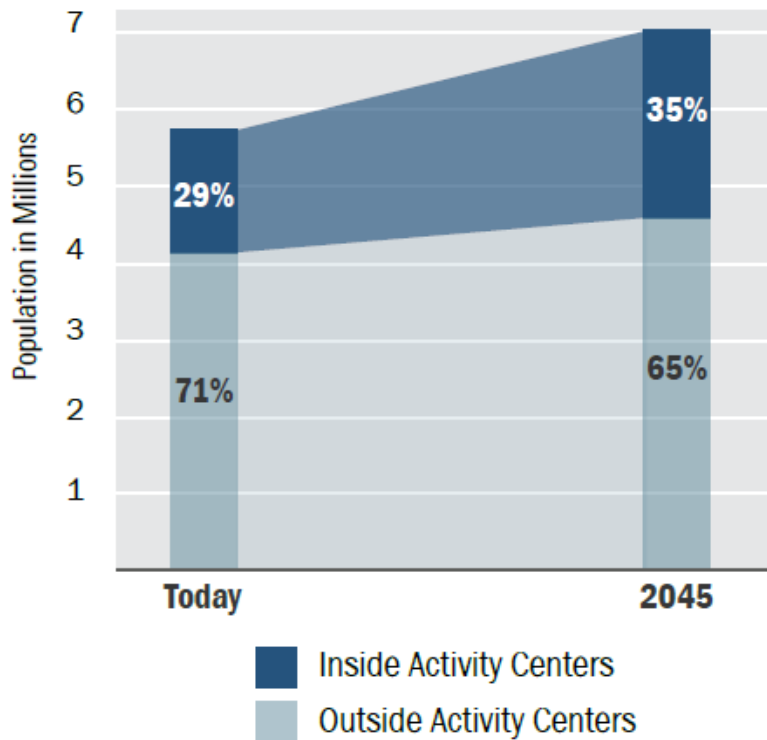
Source: MWCOG Cooperative Forecast Round 9.1



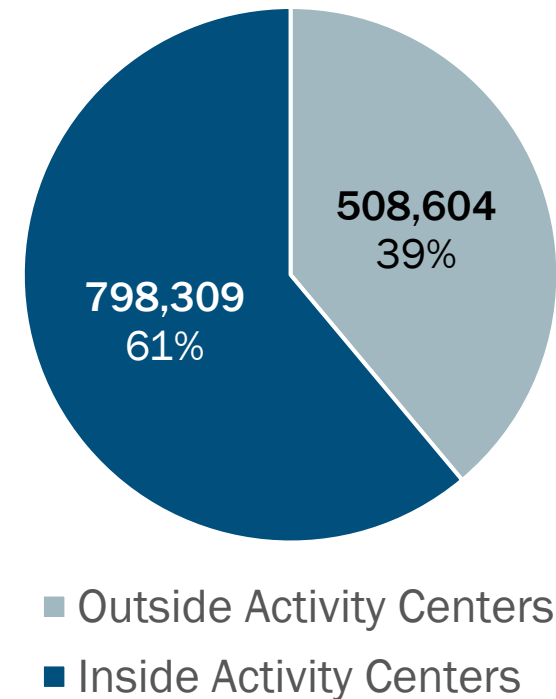
# Growth Inside and Outside Activity Centers

## POPULATION

1,300,000 New People (+23%)



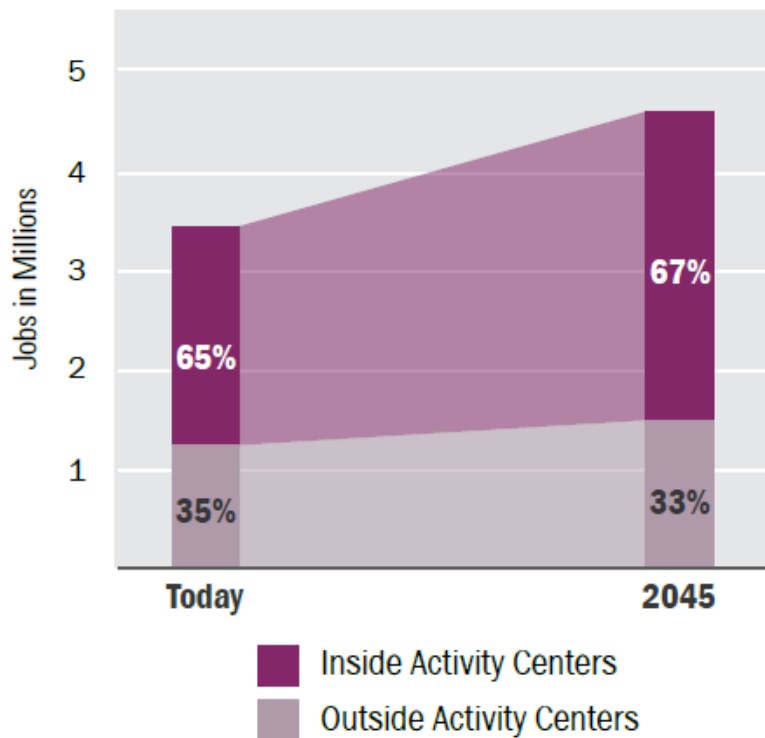
## New Regional Residents Between Now and 2045



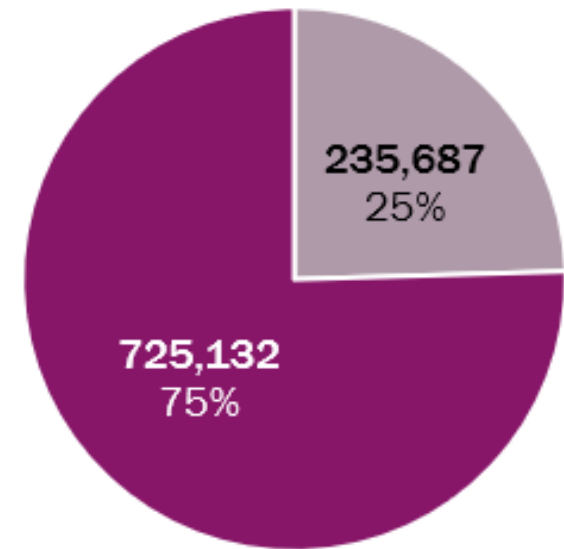
# Growth Inside and Outside Activity Centers

## JOBS

960,000 New Jobs (+29%)



## New Regional Jobs Between Now and 2045



■ Outside Activity Centers  
■ Inside Activity Centers



# Regional Policy

A regional policy framework guides the plan

- TPB Vision
- COG Region Forward
- TPB's Regional Transportation Priorities Plan
- Seven aspirational initiatives

## Evolution Of The TPB Policy Framework

1998



2010



2014



2017



# Aspirational element

What the region **aspires to do** if more resources were available

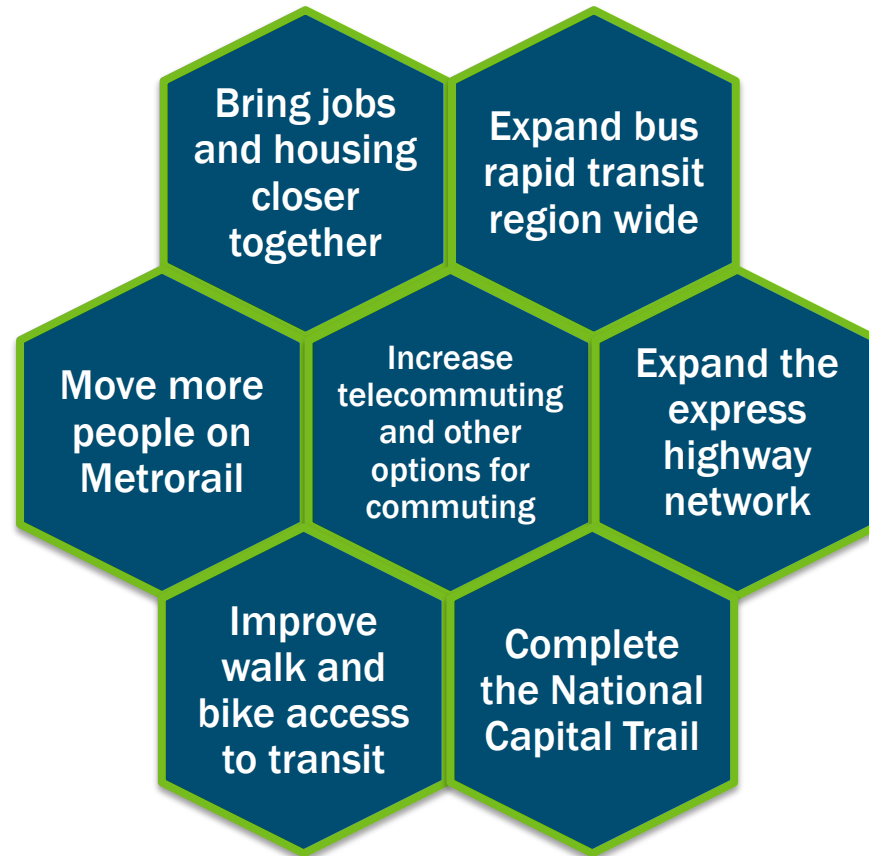
(Fort Belvoir Community Hospital/Flickr)





# Aspirational Element

## Seven endorsed initiatives



# Aspirational Element

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TPB's December 2017 endorsement:

The TPB “endorses the attached list of five initiatives, found to have the most potential to significantly improve the performance of the region’s transportation system compared to current plans and programs, for future concerted TPB action, and directs staff to **include these initiatives in the aspirational element of the TPB’s long-range transportation plan, Visualize 2045.**”

\*Jan 2018 TPB passed two others



# Aspirational Element

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- Aspirational initiatives are now part of the regional policy framework
- Conducted public forums to learn what people think about the initiatives
- 14 programs highlighted in the plan show how they can support the initiatives
- Highlights projects in the financially constrained element that help support the initiatives



# Financially Constrained Element

What the region **can do** with current levels of funding

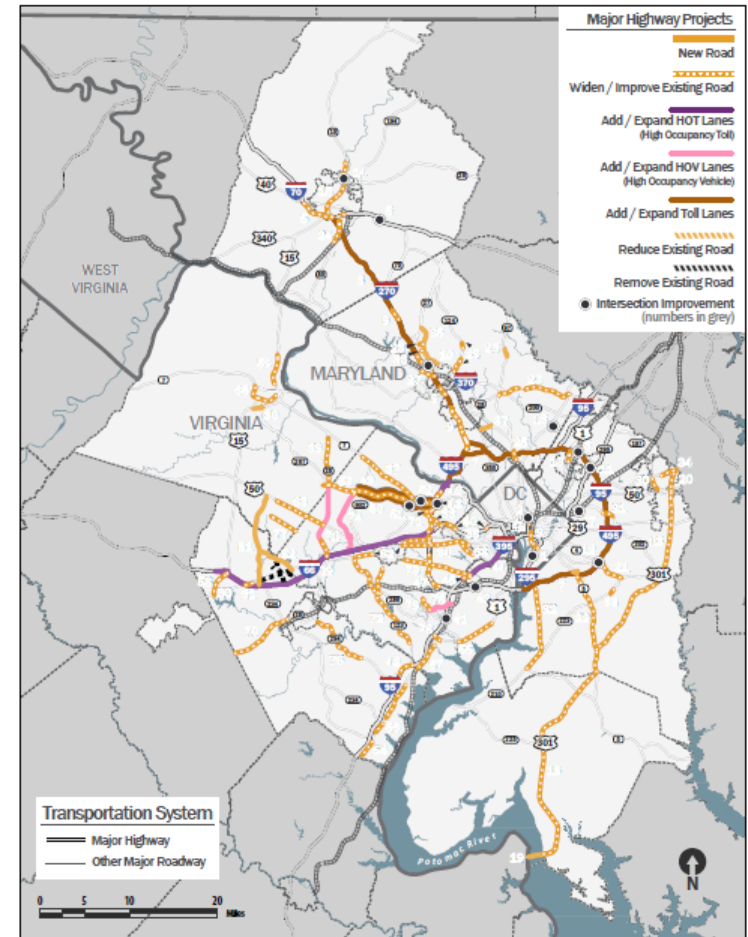
- Project highlights
- Financial plan
- Performance analysis
- Air Quality Conformity

(BeyondDC/Flickr)



# Projects in the Financially Constrained Element

- Includes more than **100 major projects** that expand or change the region's highway or transit system capacity
- More than **600 projects in total**
  - Listed in Appendix B
- Visualize 2045 added capacity:
  - Roadway: 1,388 lane miles
  - Tolled: 461 lane miles
  - Transit: 124 miles



# Projects in the Financially Constrained Element

## New Capacity in Visualize 2045

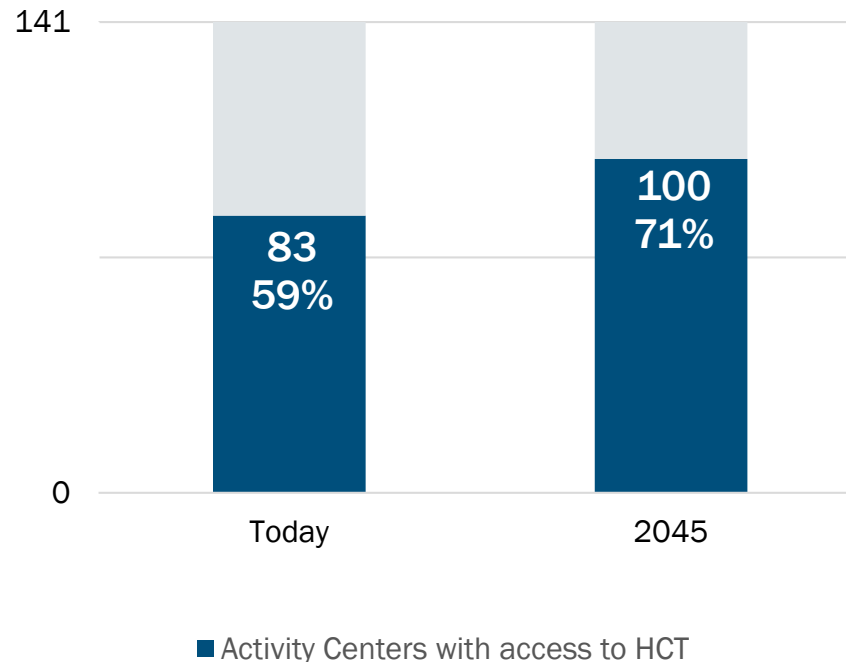
	Roadway	Managed Lanes (subset of roadway)	High-Capacity Transit*
<b>Existing</b>	17,048 lane miles	436 lane miles	292 miles
<b>Added by Visualize 2045</b>	1,388 lane miles	461 lane miles	124 miles
<b>Total 2045</b>	18,436 lane miles	897 lane miles	416 miles

\* “High-Capacity transit” defined to include Metrorail, commuter rail, streetcar, light rail or bus rapid transit.



# Projects in the Financially Constrained Element

More Activity Centers connected to High-Capacity Transit

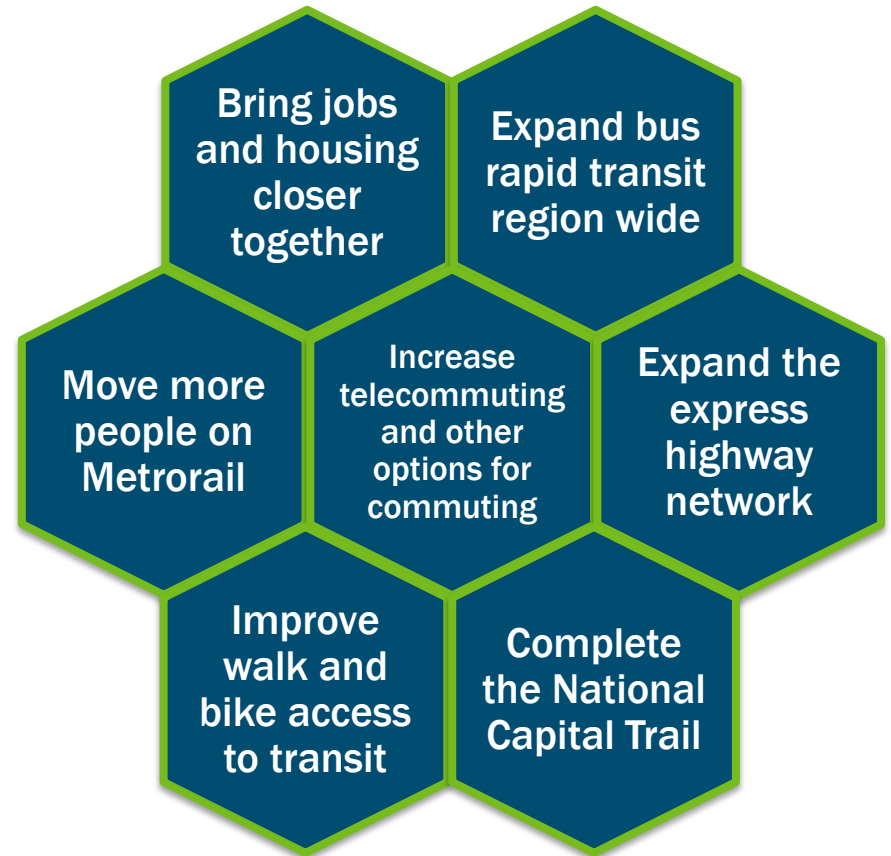


\* "Proximity" defined as within one mile of rail or within ½ mile of BRT.



# Projects in the Financially Constrained Element

The following slides highlight new or changed projects submitted for Visualize 2045 that support some of the **Seven Aspirational Initiatives**

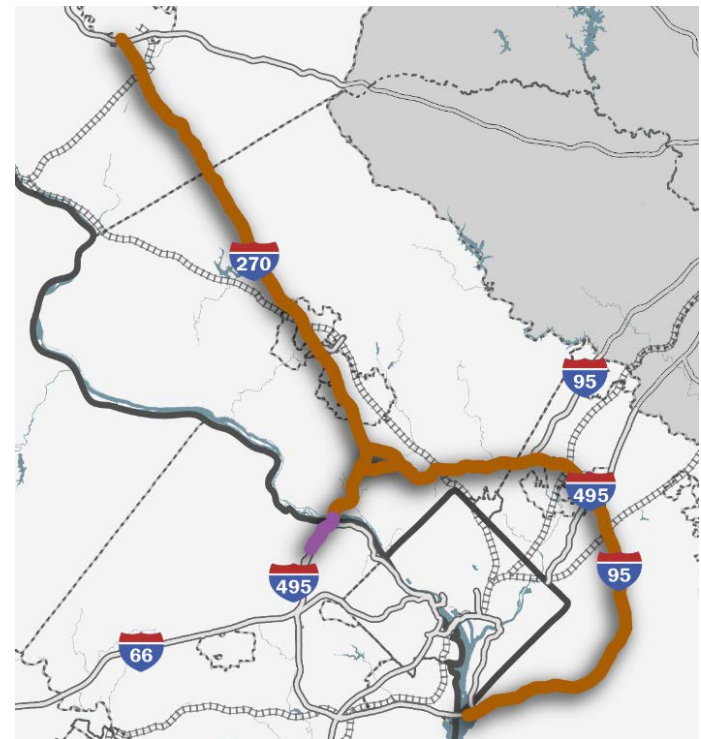




# Project Highlights

## New I-270 and I-95/I-495 Managed Lanes Projects in Maryland and Changes to I-495 HOT Lanes Project in Virginia

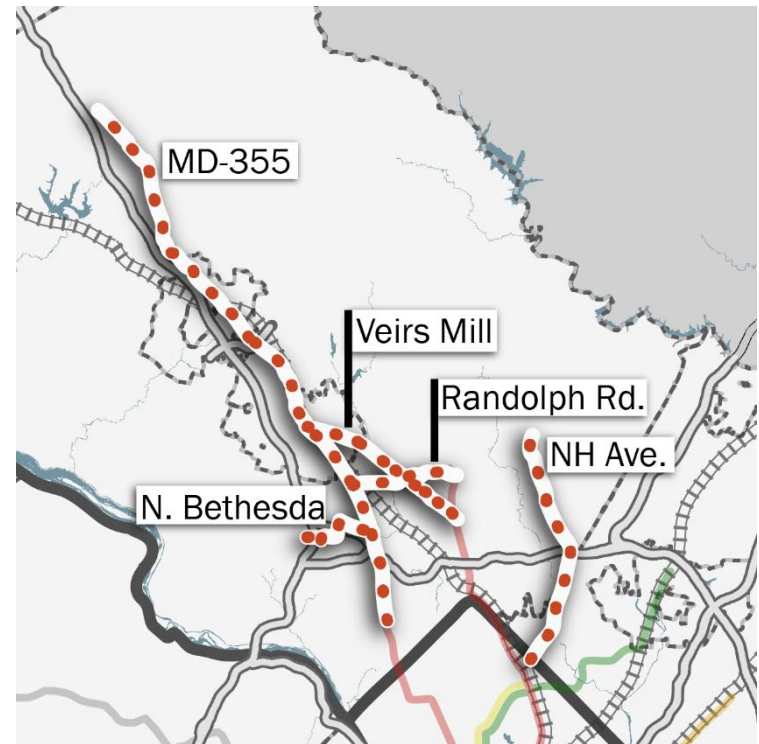
- Complete by 2025
- \$8.1 billion
  - (\$7.6 B in MD, \$0.5 B in VA)
  - Mostly private funding
- 116 new lane miles
  - 56 miles, 2 managed lanes each direction in Maryland
  - 2 miles, 2 HOT lanes each direction in Virginia
- **Expand Express Highway Network**



# Project Highlights

## New Bus Rapid Transit (BRT) Projects in Montgomery County

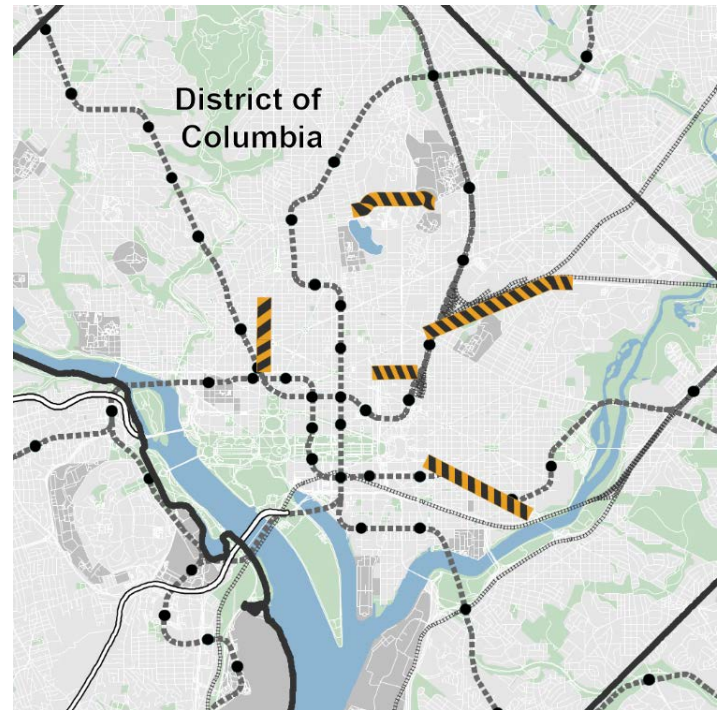
- Various segments complete in 2030, 2035, 2045
- \$1.7 billion
- 50 miles
  - Randolph Rd. (10 mi.)
  - North Bethesda (3.5 mi.)
  - MD 355 (22 mi.)
  - New Hampshire Ave. (8.5 mi.)
  - Veirs Mill Rd. (6 mi.)
- **Expand BRT Regionwide**



# Project Highlights

## New Bicycle Lanes in the District of Columbia

- Various segments complete in 2018, 2023
- \$28 million
- 6 miles
  - Pennsylvania Ave. SE
  - 17<sup>th</sup> St. NW
  - K St. NE/NW
  - Irving St. NE/NW
  - New York Ave. NE
- **Improve Walk and Bike Access to Transit**



# Project Highlights

## Metrorail Core Capacity Improvements

- Complete by 2045
- \$5.4 billion
- Implement 8-car trains system-wide during peak periods.
- Make capacity improvements to stations in the core and upgrade power systems
- Removes core capacity constraint
- **Move More People on Metrorail**



# Financial Plan

- Federal regulations require a financial plan that demonstrates how the adopted long-range plan can be implemented
- Forecast revenues must cover the estimated costs of maintaining, operating, and expanding the highway and transit system
- The plan demonstrates that the forecast revenues are reasonably expected to be available to implement Visualize 2045

(BeyondDC/Flickr)



# Financial Plan - Methodology

- For the near-term years, agencies used revenue and expenditure budgets from the approved TIP and Capital Improvement Programs (CIPs)
- For long-term years:
  - Revenues are estimated from extrapolation of past trends as well as assumptions about future increases (beyond current legislation and appropriations)
  - Expenditures are developed from project costs in the CLRP project database as well as extrapolated costs for maintenance and operations
- Estimated inflation rates are applied to convert estimates of revenues and expenditures to year of expenditure (YOE) dollars



# Financial Plan – Key Assumptions (States)

- District of Columbia
  - Revenue growth rate of 2.4% after 2023
  - Most revenue come from general tax revenues
- Suburban Maryland
  - State growth rate of 5%, federal growth rate of 3%
  - Increased private funding to build toll roads
  - Increased contribution to WMATA by the state
- Northern Virginia
  - State growth rate of 2.4%, federal growth rate of 2%
  - More regional revenues to WMATA; reduced NVTAF funds
  - Assumption that state transit capital funding will continue



# Financial Plan – Key Assumptions (WMATA)

- WMATA inputs
  - Operating revenues and costs based on extrapolation of current trends
  - Capital costs based on Capital Needs Inventory (CNI) and GM/CEO's plan
  - Assumption that PRIIA funding (\$150M/year federal, matched by DC-MD-VA) will be extended through 2045
- TPB staff modified inputs following approval of dedicated funding by DC, MD, and VA
  - New dedicated capital revenues of \$500 million annually begin in 2020 and continue through 2045
  - Removal of transit core capacity constraint from Air Quality Conformity Determination travel demand model

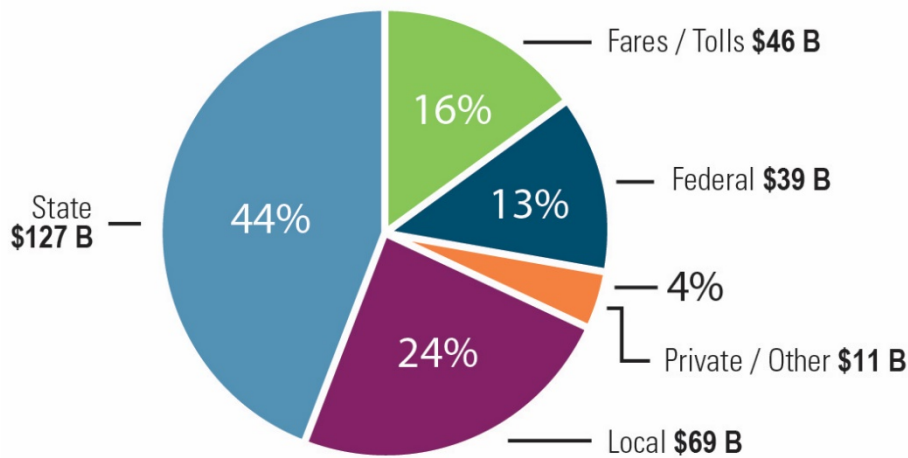




# Regional Revenues: Visualize 2045

## Visualize 2045 Revenues

\$ Billions Year of Expenditure

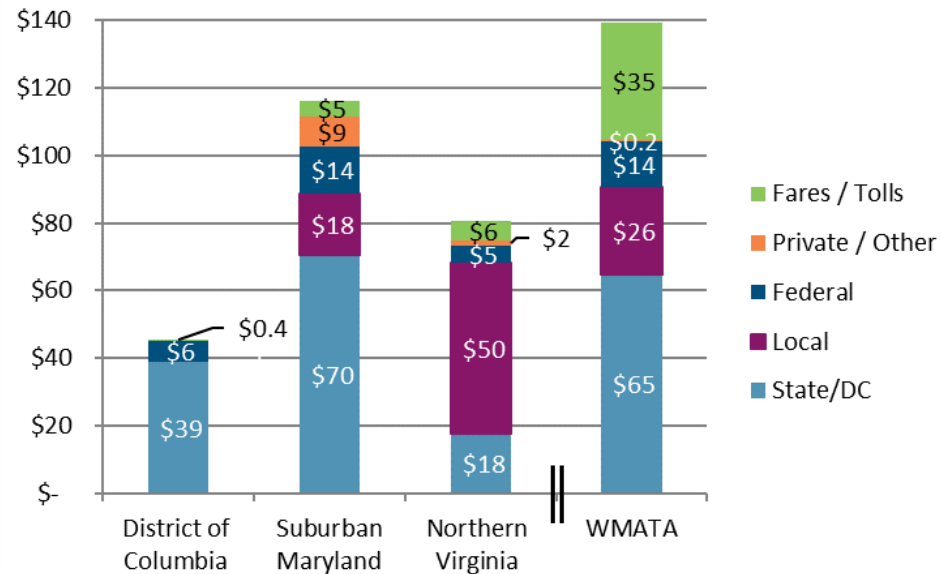


Total: \$291.1 Billion

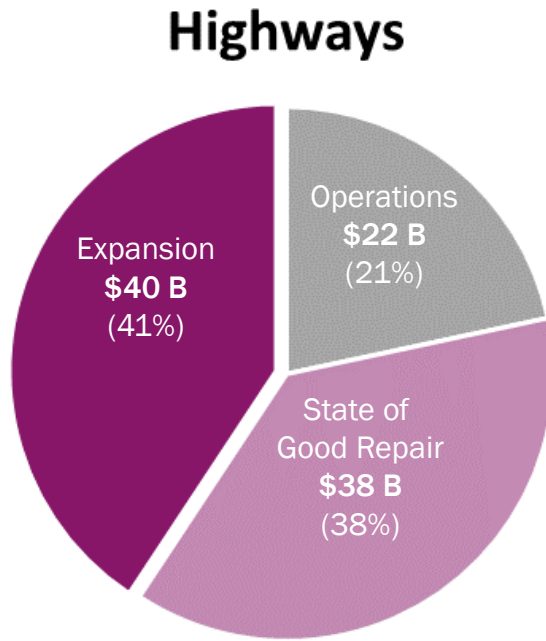
\*Units in Billions

## Revenue Source State/WMATA

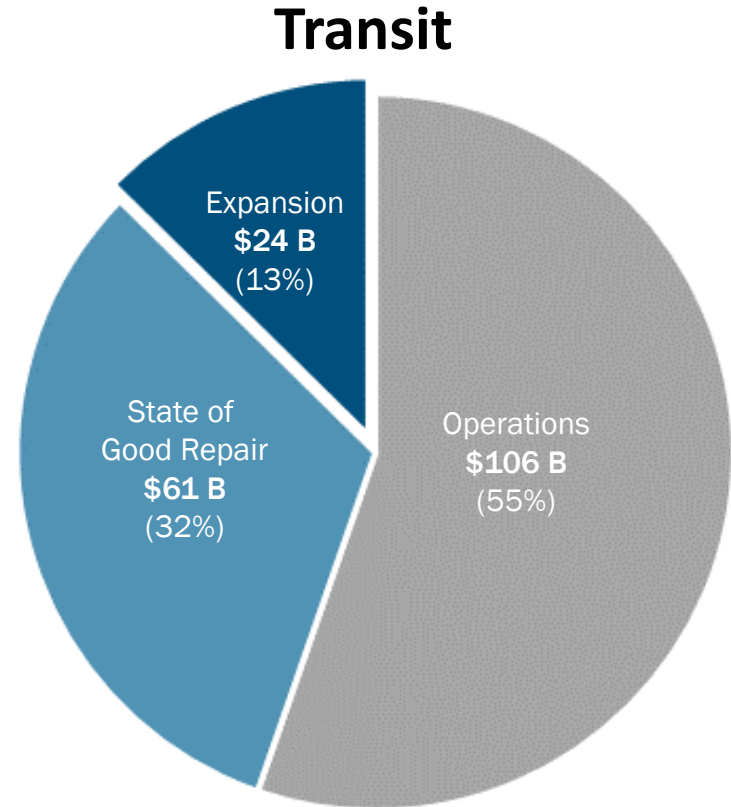
(2019 - 2045)



# Regional Expenditures: Visualize 2045



**\$99.5 Billion**  
(34% of total expenditures)



**\$191.6 Billion**  
(66% of total expenditures)



# Financial Plan: Conclusions

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The Financial Analysis demonstrates that the forecast revenues are reasonably expected to be available to implement Visualize 2045

- Demonstrates the region's commitment to maintaining a State of Good Repair for highways and public transportation systems
- Provides for operations and maintenance of the existing transportation system
- Provides for capacity expansion to address forecasted growth in the region's population and economy

The Financial Analysis is Appendix A of the Visualize 2045 plan



# Performance Analysis Summary

Sergio Ritacco  
Transportation Planner

Transportation Planning Board  
September 21, 2018

Item 8



# Air Quality Conformity

What the region **must do** to meet Federal Clean Air requirements

- Estimate emissions from the future transportation system
- Compare forecasted emissions to regional limits (mobile budgets)

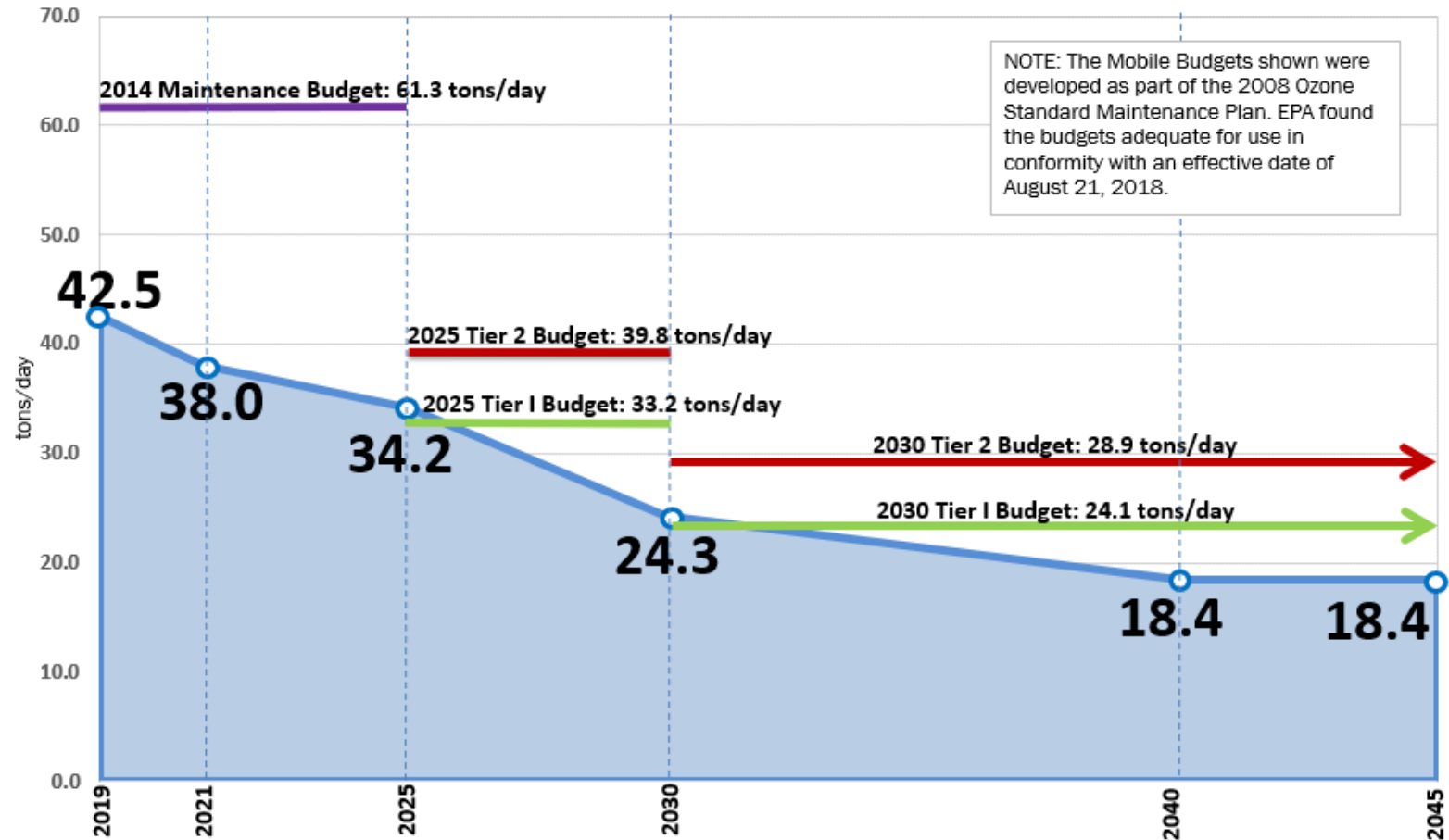
## Visualize 2045 conforms to Federal Standards

(Aimee Custis/Flickr)



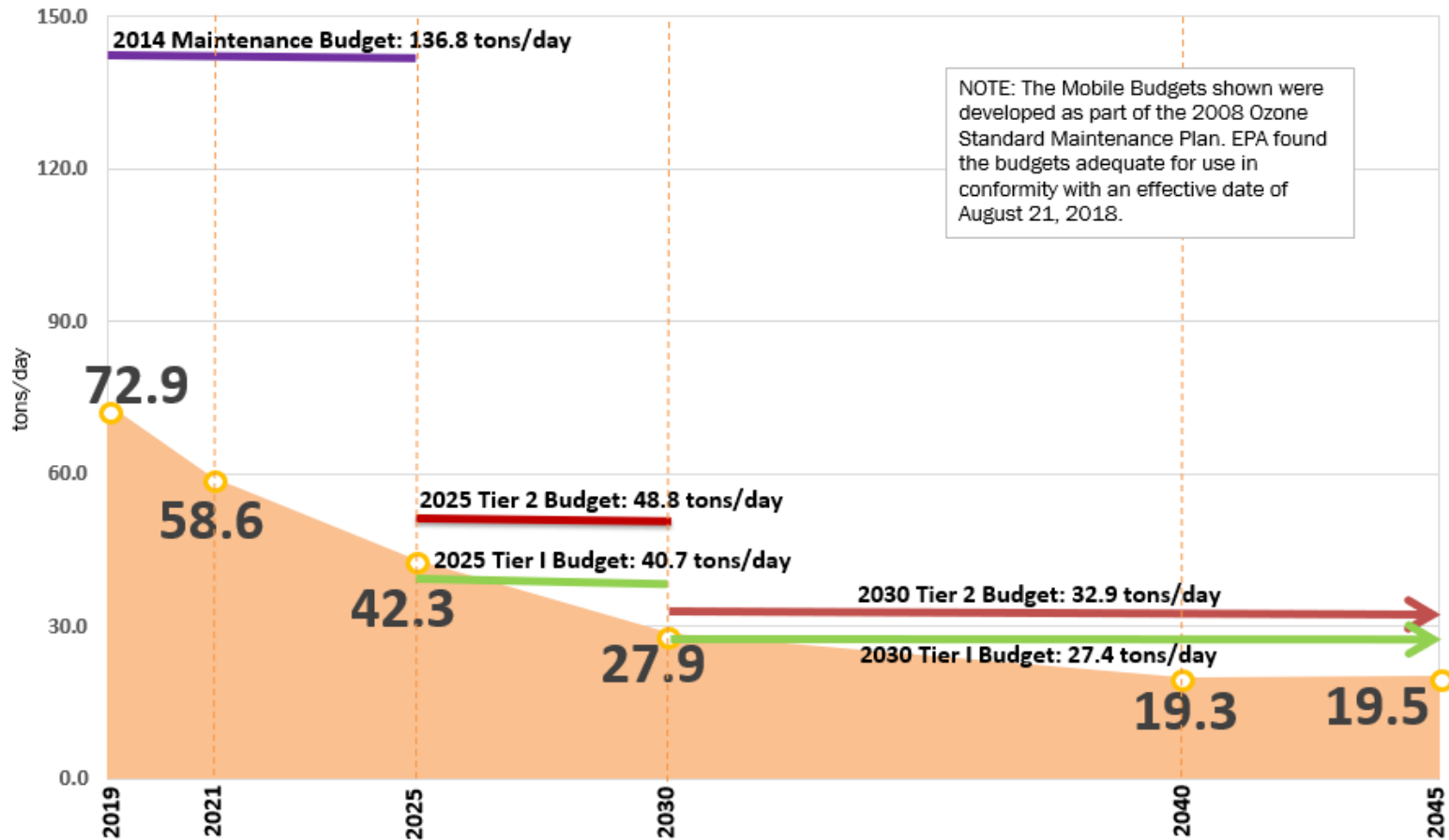
# Air Quality Conformity

## Mobile Source Emissions and Mobile Budgets Ozone Season VOC



# Air Quality Conformity

## Mobile Source Emissions and Mobile Budgets Ozone Season NOx



# Air Quality Conformity

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From the August 6, 2018 Federal Register – Notice of Adequacy Finding for the Mobile Budgets in the 2008 Ozone Maintenance SIP:

“The MVEBs ...that include a transportation buffer will be used only as needed in situations where the conformity analysis must be based on different data, models, or planning assumptions, including, but not limited to, updates to demographic, land use, or project-related assumptions, than were used to create the first set of MVEBs in the maintenance plan”





# Air Quality Conformity

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## Different in Visualize 2045:

- Cooperative Forecasts
- Vehicle Fleet
- Travel Demand Model
- Project Inputs
- Metrorail Constraint Procedures



# Conformity Inputs: Demographics

## Cooperative Forecasts\* Round 9.0 → Round 9.1

12K ▲ households (policy action by 3 States to increase housing in the region) in 2045

40K ▲ population in 2045

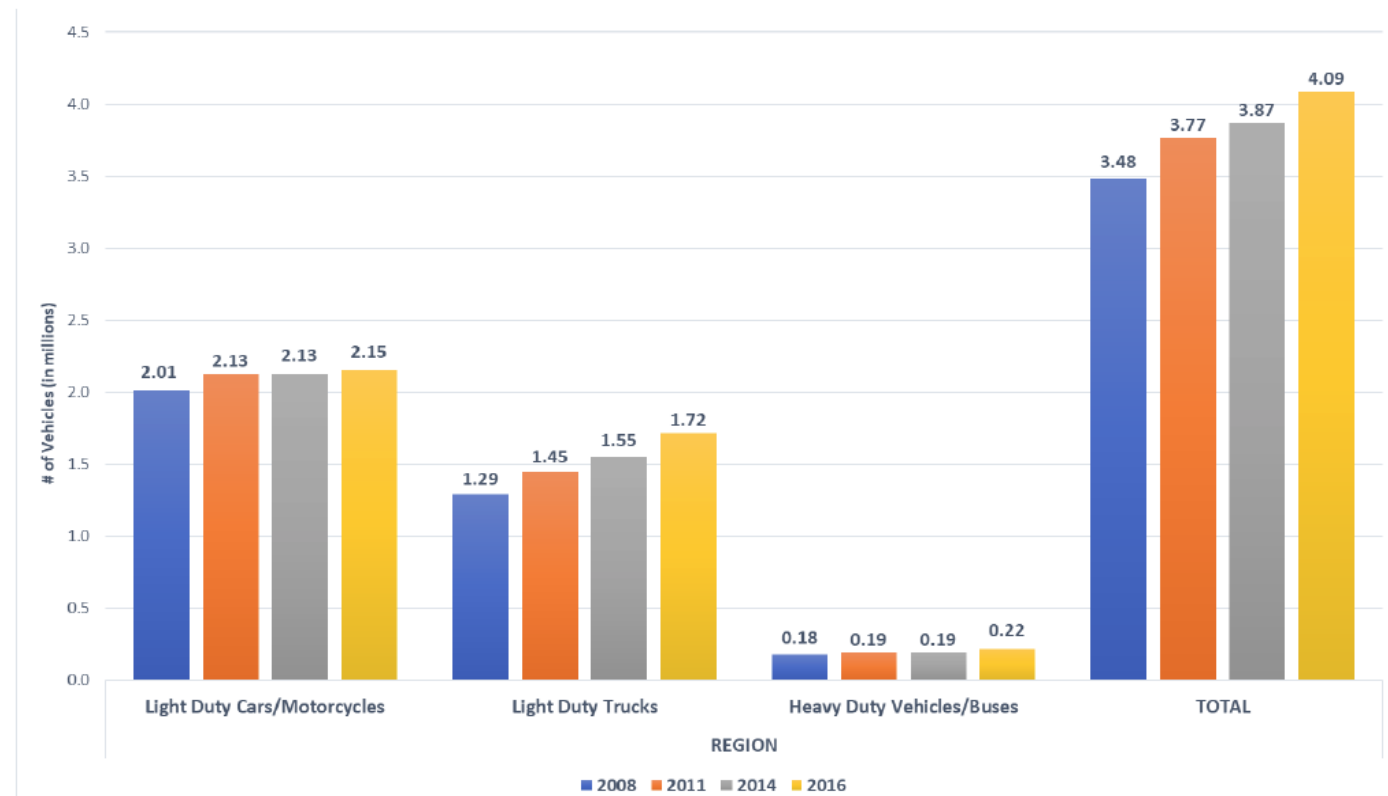
8K ▼ jobs in 2045, but  
14K ▲ jobs in 2025  
11K ▲ jobs in 2030

\*TPB modeled area



# Conformity Inputs: Vehicle Fleet

## 2014 VIN vs 2016 VIN Historical Growth in Vehicles By Type



\* Based on Decoded Records



# Conformity Analysis: Travel Model

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Travel Demand Model  
v2.3.66 → v2.3.75

- Improved accuracy of airport trip modeling
- Enhanced managed lanes modeling



# Conformity Inputs: Projects/Programs

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2016 CLRP → Visualize 2045

- New Managed Lanes on I-270 and MD Beltway
- VA Beltway Express Lanes Connection with MD Beltway
- New BRT – Five Corridors in Montgomery County
- Metrorail Core Capacity Improvements (\$5.4 Billion)\*
- US 301 Widening
- Bike Lane Corridors in the District

\*Allowed for removal of “transit constraint”



# Conformity Results: Sensitivity Test

VIN Sensitivity Test: 2025 Analysis Year

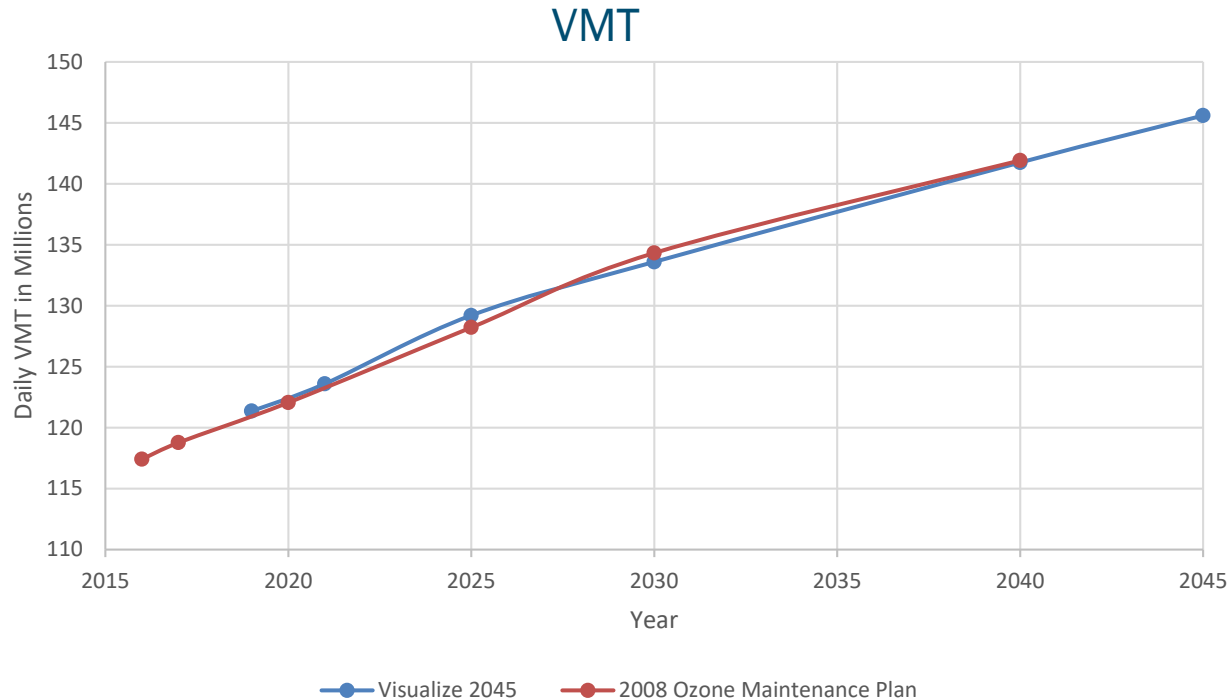
## EMISSIONS VS TIER 1 MOBILE BUDGETS

	2025 Tier 1 Mobile Budgets (tons/day)	2016 VEHICLE FLEET			2014 VEHICLE FLEET		
		Conformity Analysis (tons/day)	Conformity Analysis Difference (tons/day)	Conformity Analysis Percent Diff	VIN Sensitivity Test (tons/day)	Sensitivity Test Difference (tons/day)	Sensitivity Test Percent Diff
VOC	33.2	34.188	0.988	3%	33.608	0.408	1%
NOx	40.7	42.321	1.621	4%	40.5	-0.2	-0.5%



# Conformity Results: MP vs Visualize

## TRAVEL DEMAND OUTPUT\* Visualize 2045 vs 2008 Ozone Maintenance Plan

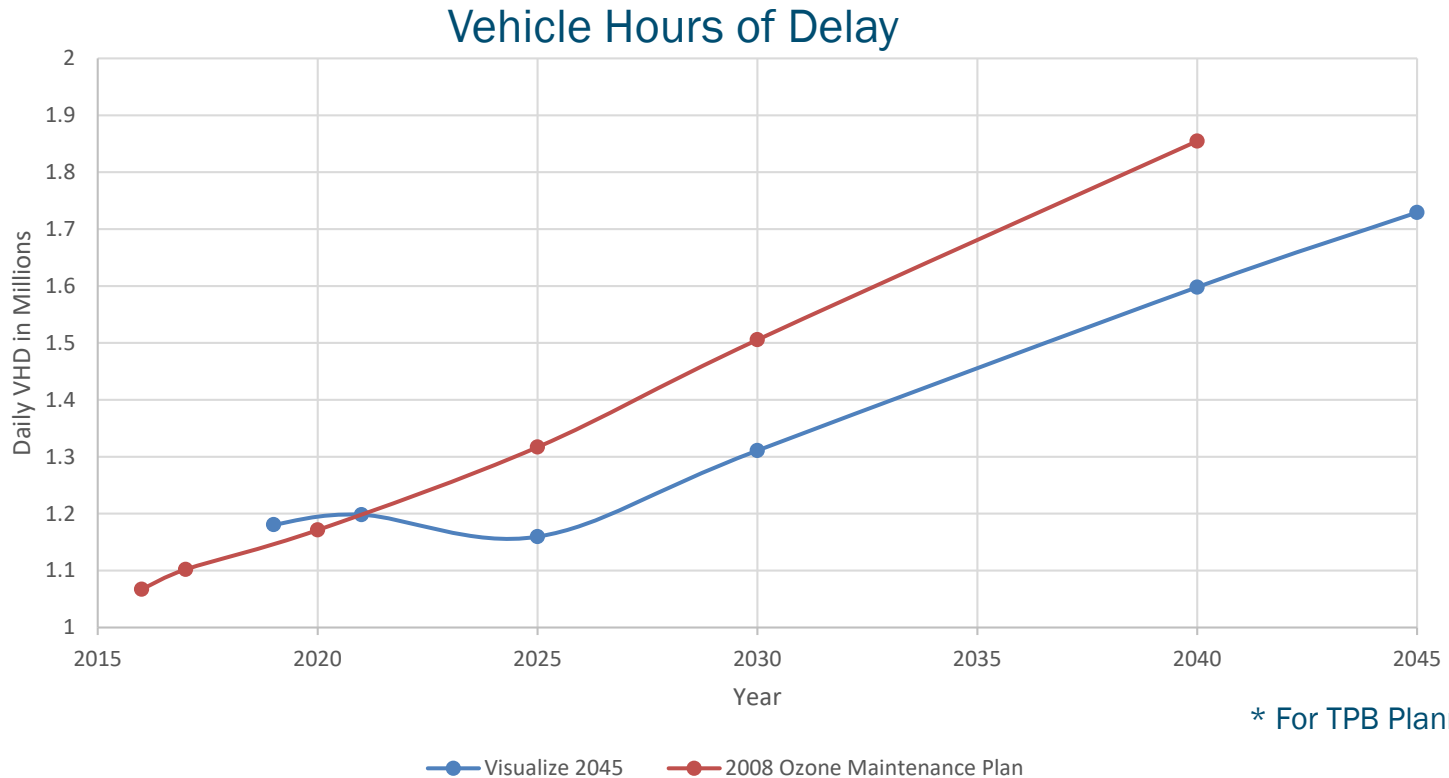


\* For TPB Planning Area



# Conformity Results: MP vs Visualize

## TRAVEL DEMAND OUTPUT\* Visualize 2045 vs 2008 Ozone Maintenance Plan

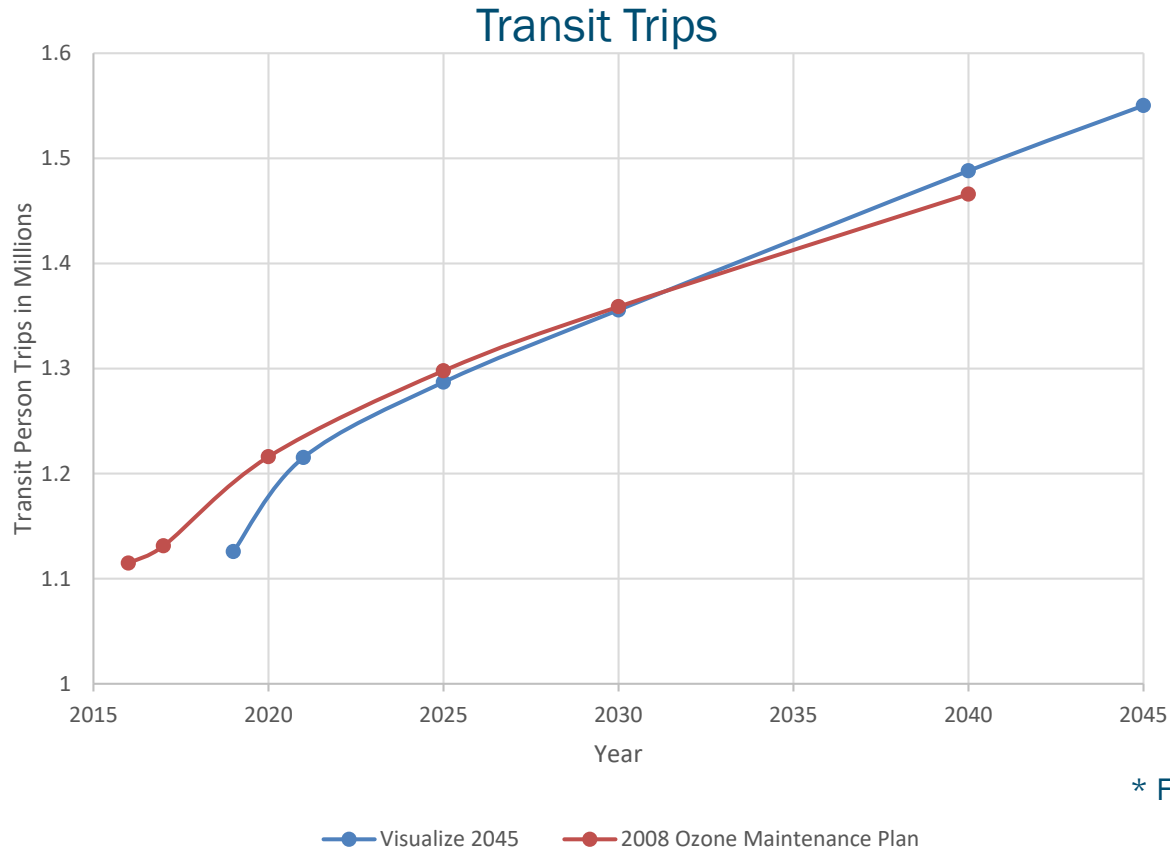




# Conformity Results: MP vs Visualize

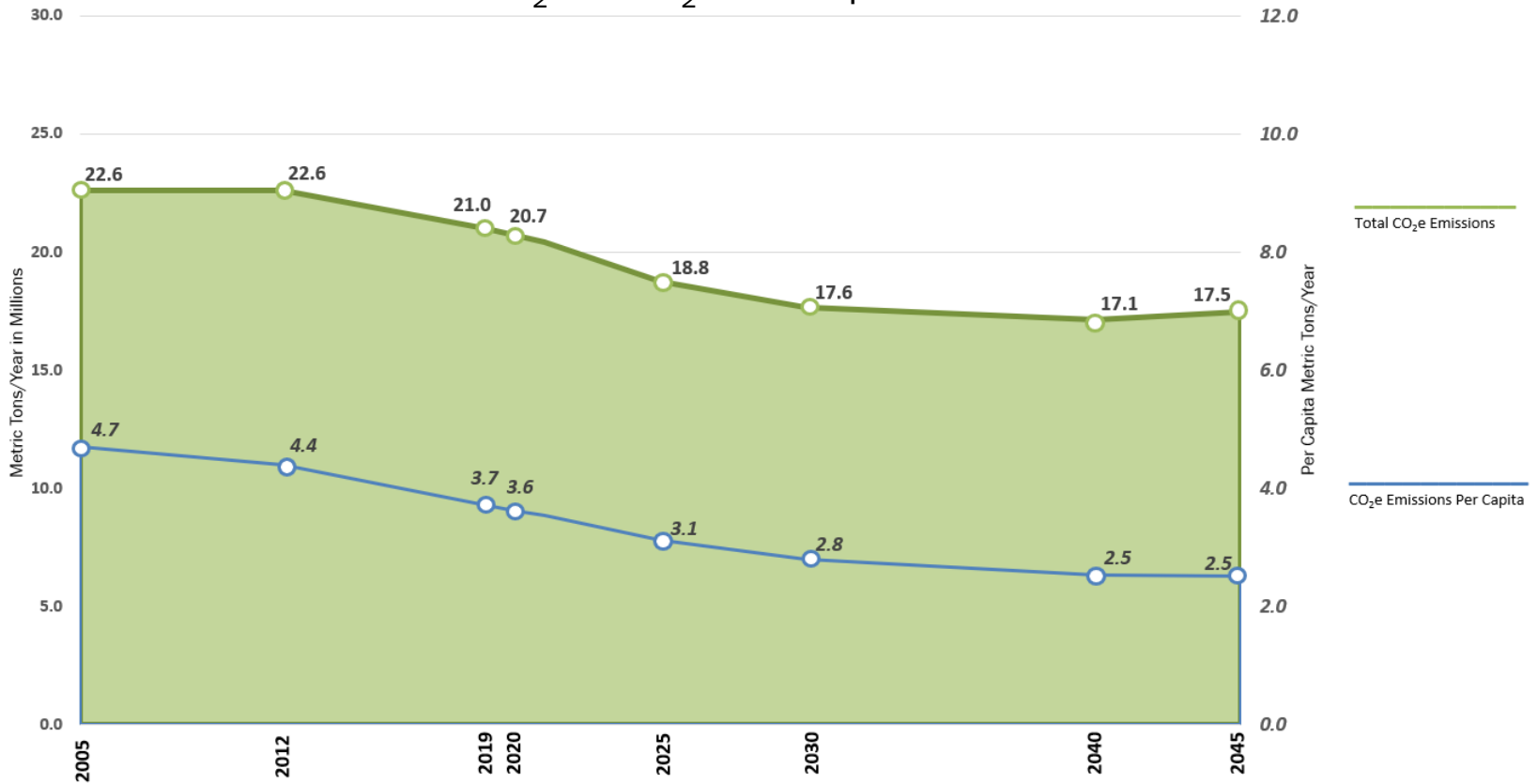
## TRAVEL DEMAND OUTPUT\*

### Visualize 2045 vs 2008 Ozone Maintenance Plan



# Greenhouse Gases

Visualize 2045  
Greenhouse Gas  
Mobile Source Emissions  
CO<sub>2</sub> and CO<sub>2</sub> e Per Capita



# Performance Planning

Performance Based Planning and Programming, the Congestion Management Process, and Safety

- TPB champions improvements in the ways the transportation system is managed and operated
- Federal laws require target setting and progress reports through PBPP
- Visualize 2045 includes these elements of performance planning as drivers of decision making

(Geoff Livingston/Flickr)





# Additional Elements

Additional elements cover other TPB planning activities:

- Freight Planning
- Airport Systems Planning
- Intercity Buses
- Coordinated Human Service Transportation Plan
- Travel and Tourism
- Resiliency and Reliability
- Emergency Preparedness
- Management and Operations
- Evolving Technology

(Joe Flood/Flickr)



# Bicycle and Pedestrian Planning

- TPB's Bicycle and Pedestrian Plan
- Street Smart
- Aspirational initiatives:
  - Complete the National Capital Trail
  - Improve Walk and Bike Access to Transit
- Complete Streets Policy
- TLC and TAP



# Land-Use Coordination

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## Land-use and transportation are complex and intertwined

- TPB staff work closely with COG's Department of Community Planning and Services
- Activity Centers - locations that will accommodate the majority of the region's future growth, including existing urban centers, priority growth areas, traditional towns, and transit hubs
- Transportation/Land-Use Connections (TLC) program
- Aspirational initiative focused on bringing jobs and housing closer together



# Equity and Inclusion

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- Equity Emphasis Areas (EEAs) adopted by TPB in 2017:
  - Small geographic areas that have concentrations of low-income and/or minority populations based on Census data
- EEAs can be used to
  - Examine demographic patterns
  - Analyze the constrained element of the plan for disproportionate and adverse impacts
- Access for All Advisory Committee
  - Advises the TPB on transportation issues, programs, policies, and services important to traditionally underserved communities



# Transportation Demand Management (TDM)

- Commuter Connections is the TPB's TDM program
  - Creates awareness of alternatives to driving alone
  - Promotes and encourages TDM strategies such as employer-based parking cash-out, transit/vanpool benefits, teleworking, and flexible work schedules
- One aspirational initiative focuses on increasing the use of telework and other modes of travel besides driving alone



(Fort George G. Meade Public Affairs/Flickr)





# Environmental Consultation and Mitigation

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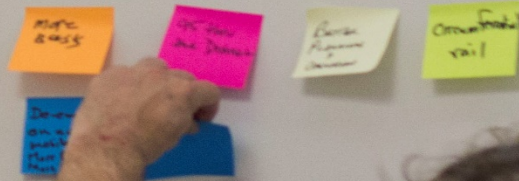
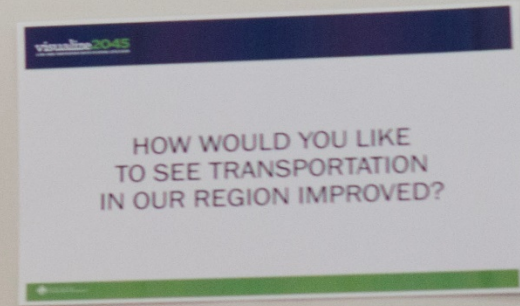
A new interactive map provides a regional-level resource to inform the relationship between the transportation and environmental concerns.

[mwcog.org/EnviroInventoryMap](http://mwcog.org/EnviroInventoryMap)



# Public Participation

- Public Input Survey
  - Two groups of survey respondents
  - Outreach included 15 survey events, social media, and other promotion
- Public Forums across the region
  - Focus on the aspirational initiatives where input is most needed
- Open Houses
  - 3 Open Houses so people in the region can learn more about the plan



# Public Participation

What people said:

- Frustrations with system reliability
- General familiarity with the aspirational initiatives
- Desire to move more quickly in implementing changes
- Concerns about equity and regional balance
- Calls for thinking “outside the box”



Andrew Austin  
Andrew Meese  
Jane Posey  
Eric Randall  
Sergio Ritacco  
John Swanson  
Lori Zeller  
Abigail Zenner

[Visualize2045.org](http://Visualize2045.org)

(Andrew/flickr)

