Approved June 15, 2022

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A long-range transportation plan for the National Capital Region

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The TPB respectfully acknowledges that the National Capital Region exists on the traditional lands of the Doeg, Manahoac, Nacotchtank, Piscataway, and Susquehannock People, and pays respect to elders and all people of these First Nations, both past and present. (Tribal lands source: **native-land.ca)*

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VIEWING DIGITALLY?

Click on the section you would like to jump to for fastest results.

APPENDICES: Available online at visualize2045.org/draftplan

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Introduction

About the TPB

The National Capital Region Transportation Planning Board (TPB) is the designated Metropolitan Planning Organization (MPO) for the Washington region. Since its inception in 1965, the TPB has served as a regional forum for establishing policy principles and priorities that guide transportation decision-making. The TPB works with state and local jurisdictions and transportation agencies to bring world class transportation options to the region. As an MPO, the TPB is responsible for conducting the federally mandated transportation planning process for the metropolitan area, which includes developing and updating the regional long-range transportation plan, known as Visualize 2045, and the Transportation Improvement Program (TIP). The TPB is staffed by the Department of Transportation Planning at the Metropolitan Washington Council of Governments (COG). A summary of TPB programmatic activities can be found **online**.

The TPB's membership is made up of representatives from the District of Columbia, Maryland, and Virginia departments of transportation, the Washington Metropolitan Area Transit Authority (WMATA), local governments, and state legislatures. There are 44 members of the TPB, 39 of which are voting members, and five non-voting members from the Metropolitan Washington Airports Authority and federal agencies.

WHAT IS AN MPO?

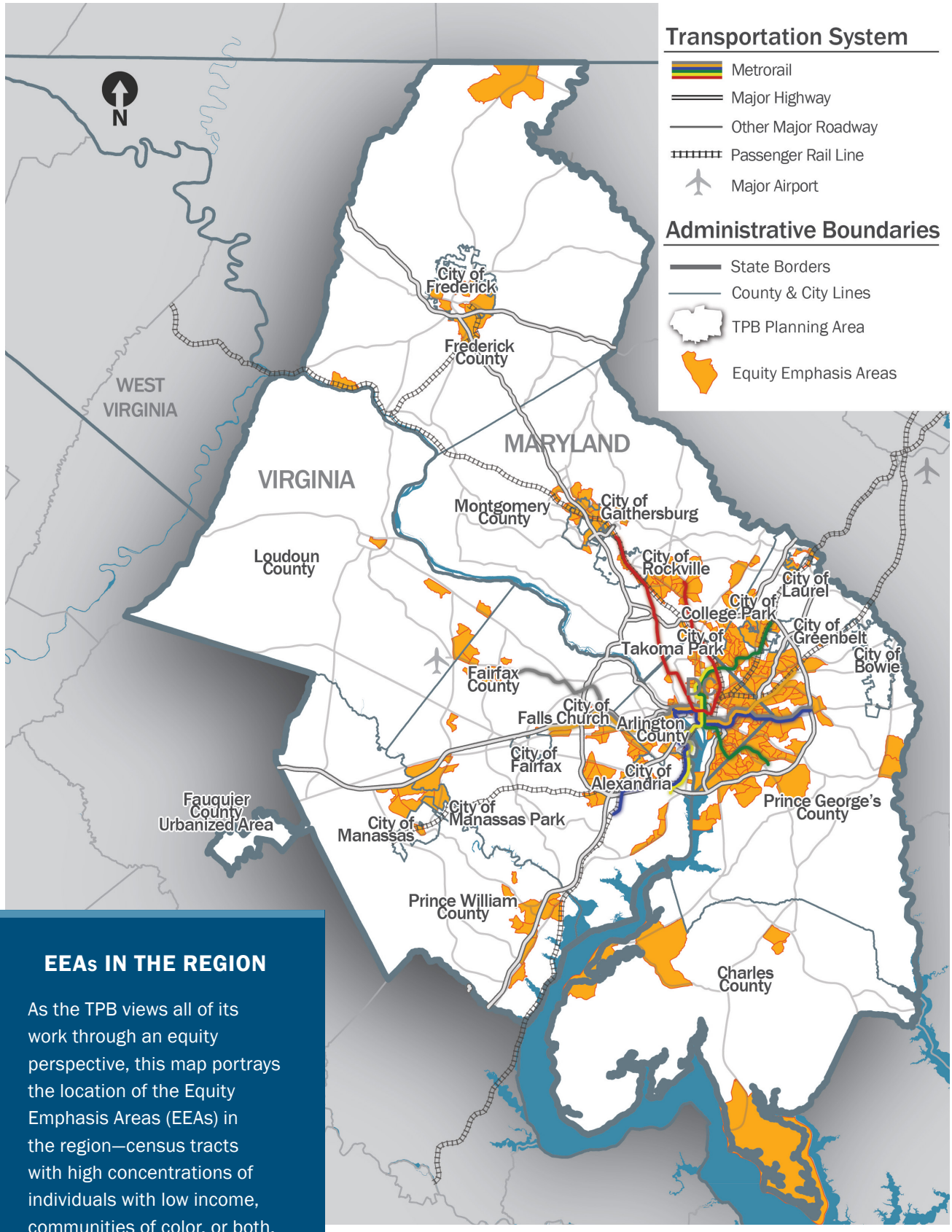
The TPB, as the region's MPO, performs a range of activities that promote an integrated approach to transportation development, but it does not exercise direct control over most funding and it does not implement projects.

The requirements of federal law compel the key transportation players in the region to work through the TPB process. The TPB exercises its role as a coordinating agency in several ways, it:

- Ensures compliance with federal laws and requirements.
- Provides a regional transportation policy framework and a forum for coordination.
- Provides technical resources for decision-making.

The TPB's planning area, the National Capital Region, is home to approximately 5.7 million people. It includes the District of Columbia and 23 surrounding counties and cities in suburban Maryland and Northern Virginia (Figure I.1). The planning area spans approximately 3,500 square miles. A detailed description of the region's demographics, transportation system, development and travel patterns can be found in Chapter 2 "Where Are We Today?".

Figure I.1: TPB Planning Area and Regional Overview Map showing Equity Emphasis Areas



EEAs IN THE REGION

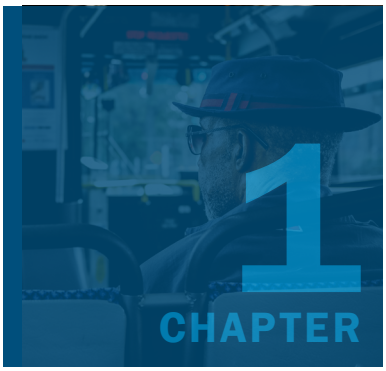
As the TPB views all of its work through an equity perspective, this map portrays the location of the Equity Emphasis Areas (EEAs) in the region—census tracts with high concentrations of individuals with low income, communities of color, or both.


Der Berzerker/Flickr

Summary of the Visualize 2045 Update

Plan Organization

The plan applies an equity lens and an integrated planning approach as the region works toward shared regional goals, with a renewed emphasis on safety and climate resilience. The plan is organized into nine chapters, a summary follows:



About the Plan

Chapter 1 provides an overview of the regional planning process, federal requirements, and how to get involved. It summarizes plan development and introduces key concepts, such as what types of projects are in the plan and how local projects move toward inclusion in the plan. It includes a description of opportunities to engage, roles, responsibilities, and where to find more information. This chapter also summarizes the federal requirements that TPB must comply with to produce the plan. See Appendix K for more detailed information on requirements and how the TPB demonstrates compliance.

Where Are We Today?

Chapter 2 describes the regional context. This includes a description of the region's geography, demographics, and existing and projected population and jobs. It reflects on the current cultural, social, and environmental conditions that impact the planning and use of the transportation system. This chapter also describes the transportation system and services that support the region.

Visualizing Our Future Together

Chapter 3 describes the TPB's policy framework—a set of goals and priorities to work toward in our region. TPB members agencies consider these when developing and selecting projects to fund and implement. The chapter discusses challenges to address as the region plans and offers a summary of public input in response to the question, "What transportation investments would future generations thank us for?"

visualize 2045

To learn more about Visualize 2045, check out the infographic on the next page and its companion animated video available on the Visualize 2045 website.

What Factors Affect Our Future?

The future is always uncertain, but the region's agencies work together to manage the transportation system effectively in an ever-changing world. The TPB examines many planning areas, including the federal planning factors it must consider when planning. Chapter 4 highlights emerging and significant factors that can impact our communities and transportation demand, services, operations, maintenance, planning, and investments.

How Do We Engage the Public?

This chapter summarizes the Voices of the Region—TPB's public engagement for the Visualize 2045 update. It describes the comment periods for Visualize 2045, the Community Advisory Committee, and other communication avenues with the public.

Voices of the Region

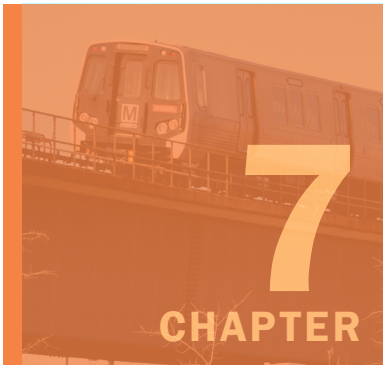
COMMUNICATING PUBLIC PERSPECTIVES

For the Visualize 2045 update, the TPB conducted public engagement known as Voices of the Region that gathered information about public perspectives and engaged residents in a regional virtual activity about TPB's Aspirational Initiatives. The perspectives of different voices of the region which come from participants from all ages, education, socioeconomic status, race, and geographic location may be found throughout the plan.

You will find magenta call-out boxes like this one that provide data and reference quotations from individuals living in our region. The Voices of the Region features in this plan update showcases how our regional transportation policies affect everyone in our region and highlights voices that have been underrepresented in the past.

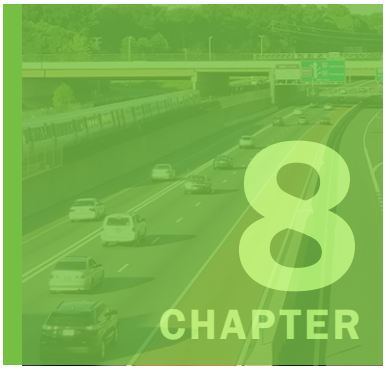
Strategies for a Brighter Future

Chapter 6 describes the planning activities and strategies that the TPB and its partners use to work toward a brighter future where the transportation system serves the needs of all its users. The chapter reviews regional coordination, planning areas, policy and equity considerations, and associated activities. Topics include the Aspirational Initiatives, transportation modal options, the future factors, federal planning factors, and other planning areas.



Funding the Transportation System

Chapter 7 provides an overview of transportation funding and the financial plan. It delivers information about the projects in the financially constrained element of the plan, including lists and maps. It reviews how the projects in the plan advance the TPB's goals and policy priorities, including the concepts of the Aspirational Initiatives.



Planning for Performance

Chapter 8 describes the TPB's performance planning activities conducted to strive for better outcomes, as documented through the federally mandated performance-based planning and programming (PBPP) and congestion management process (CMP). The chapter summarizes the findings of the Air Quality Conformity and system performance analyses of the constrained element of Visualize 2045.

What Happens Next?

Through this plan, our region Visualizes its Future Together. What will it look like? What challenges does the region face, and how does it work together to overcome them? Chapter 9 looks back at progress, reflects on challenges of the present moment and years ahead. It looks forward to actions needed to achieve the desired outcomes outlined in TPB goals, while continuing to meet the federal requirements for metropolitan planning.

This plan was prepared in accordance with 49 USC 5303(i), to accomplish the objectives outlined by the TPB, its member states, and the public transportation providers with respect to the development of the metropolitan Washington region's transportation network. This plan identifies how the region will manage and operate its multimodal transportation system (including transit, highway, bicycle, pedestrian, and accessible transportation) to meet the region's goals—for a 20+-year planning horizon, while remaining fiscally constrained.

Arlington DES/Flickr

FIND MORE ONLINE!

This document includes numerous **hyperlinks** *to make it easy for the online user to access additional information.*

For people using the printed version of the plan, a summary of websites referenced can be found on the Visualize 2045 website plan update page: **visualize2045.org**

VISUALIZING A BRIGHTER TRANSPORTATION FUTURE

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THE CHALLENGE

Metropolitan Washington is growing.

By 2045: The number of trips per day will grow from **18 million** to **21 million**, leaving roads congested and transit crowded.

We need real choices for how we get around.

By 2045: Average delay per trip ▲ **30%** | Total delay hours ▲ **48%**

Let's plan something better. Visualize 2045 is our region's plan for what we ***intend*** to do with existing funding ...

	Today	2045	
People	5.7 million	7.0 million	▲ 23%
Jobs	3.4 million	4.3 million	▲ 26%

THE SOLUTION

Expand choices for all travelers

Maximize travel safety and efficiency

Protect natural and cultural resources, and mitigate climate change

Ensure our infrastructure lasts and is resilient

Contribute to a regional economy

Support equitable travel within our region and beyond

... and what we *aspire* to do by thinking regionally and acting locally:

Bring jobs and housing closer together, so it's easy to walk, bike, and take transit to work and play.

Expand bus rapid transit and transitways, offering the speed of rail at a fraction of the cost to build.

Move more people on Metrorail, because longer trains and more stations mean more on-time arrivals.

Increase telecommuting and other options for commuting, so you control your work-life balance.

Complete the National Capital Trail Network, an accessible "bicycle beltway" for recreation and commuting.

Improve walk and bike access to transit, so getting around your community is safer and easier.

Expand the express highway network, helping cars and buses get there faster.

Implement effective strategies to mitigate climate change and support resilient communities.

THE IMPACT

Shorter trips. More affordable travel options. More time with friends and family.

Source: TPB

Acronyms and Initialisms

Abbreviation	Planning Term
AC	Activity Center
AQC	Air Quality Conformity
BRT	Bus Rapid Transit
CAVs	Connected and Automated Vehicles
CEAP	Climate and Energy Action Plan
CMP	Congestion Management Process
COG	Metropolitan Washington Council of Governments
DOT	Department of Transportation (DDOT, VDOT, MDOT)
EEA	Equity Emphasis Area
EV	Electric Vehicle
FAST ACT	Fixing America's Surface Transportation (FAST) Act
GHG	Greenhouse Gas
HCT	High Capacity Transit
HOV	High Occupancy Vehicle
HOT	High Occupancy Toll lane
ITS	Intelligent Transportation System
LRTP	Long-Range Transportation Plan
M&O	Management and Operations
MARC	Maryland Area Regional Commuter Train Service
MAP-21	Moving Ahead for Progress in the 21st Century Act
MPO	Metropolitan Planning Organization
PBPP	Performance-Based Planning and Programming
RTPP	Regional Transportation Priorities Plan
RTS	Regional (Household) Travel Survey
SOV	Single Occupant Vehicle
TAFA	Transit Access Focus Area
TDM	Travel Demand Management
TIP	Transportation Improvement Program
TLC	Transportation Land-Use Connections
TNC	Transportation Network Companies
TPB	National Capital Region Transportation Planning Board
TSP	Transit Signal Priority
TTR	Travel Time Reliability
VMT	Vehicle-Miles Traveled
VRE	Virginia Railway Express
WMATA	Washington Metropolitan Area Transit Authority

A Few Key Terms:

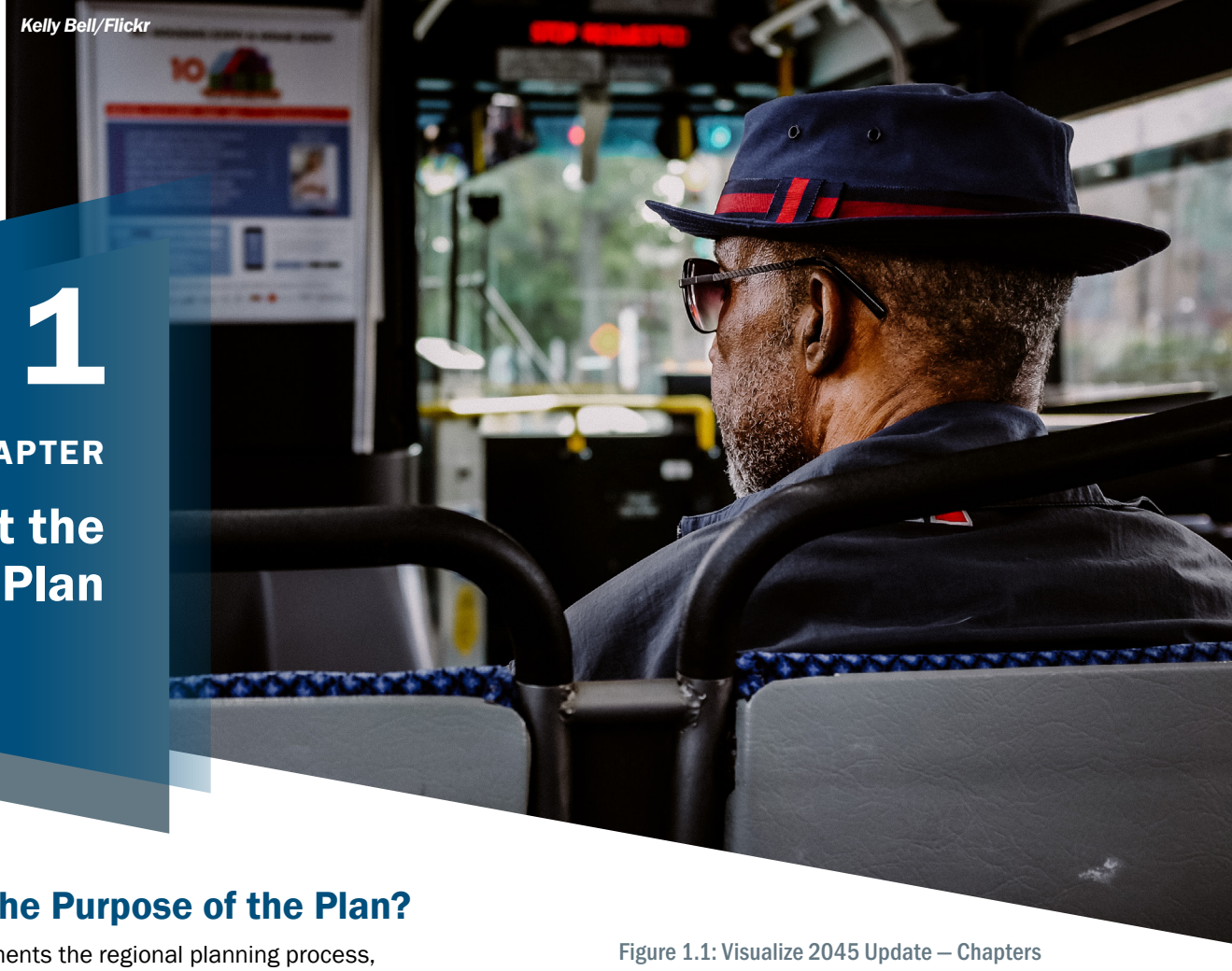
Clean Air Act (CAA)
The Clean Air Act is the law that defines EPA's responsibilities for protecting and improving the nation's air quality and the stratospheric ozone layer. The TPB's Air Quality Conformity analysis responds to requirements of this Act.

Congestion Mitigation & Air Quality (CMAQ) Program
The CMAQ program provides funds for projects and activities which reduce congestion and improve air quality. To be eligible for CMAQ, projects and activities must contribute to the National Ambient Air Quality Standards and must be included in a Transportation Improvement Program.

Fiscally Constrained
Federal requirements are such that the long-range transportation plan and the Transportation Improvement Program are required to be fiscally constrained, which means that the projects listed in these documents must have funding sources that are reasonably available over the life of the plan/program to pay for both the capital and operating cost of the proposed improvements.

Core, Inner & Outer Suburbs
The TPB uses these terms in the plan when referring to variations in travel, land-use and demographics in the region. The region's core includes the District of Columbia, Arlington County, and the City of Alexandria. The Inner Suburbs: Montgomery County, Prince George's County, Fairfax County and Cities. The Outer Suburbs: Charles, Frederick, Loudoun, Prince William Counties and the Cities within (including portions of Fauquier County).

John Brighenti/Flickr



Kelly Bell/Flickr

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CHAPTER

About the Plan

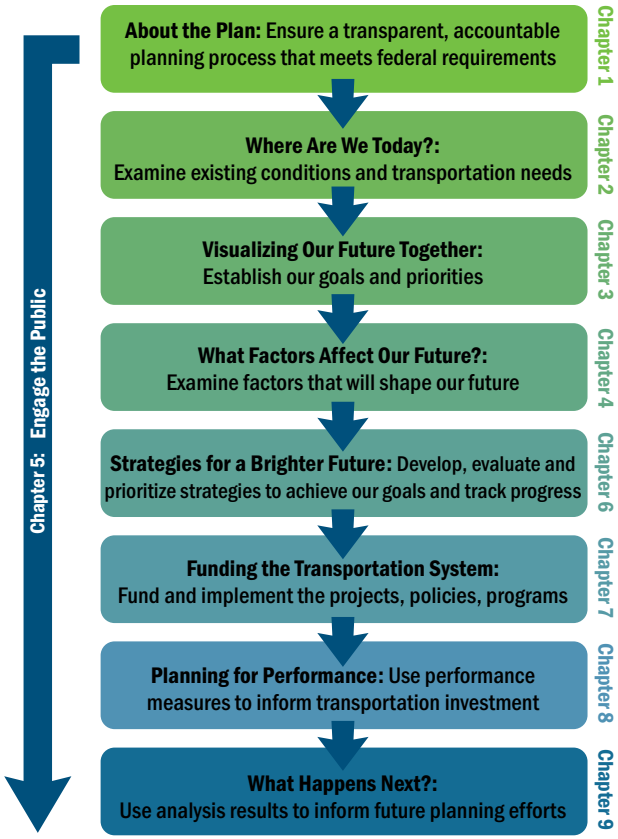
What is the Purpose of the Plan?

The TPB documents the regional planning process, activities, and planned investments for the region's transportation future through Visualize 2045, the region's long-range transportation plan (LRTP). This plan describes how the TPB and its many member jurisdictions and independent transit agencies work together to achieve shared goals.

The plan reports how the TPB and its members tackle challenges facing the region, gather public opinion, and advance the most effective strategies to make progress on the region's goals today and in the future. Each transportation agency in the region plans and funds programs, policies, and projects that respond to regional and local goals. Those projects that rise to regional significance are included in the project list of this plan, so long as sufficient revenue is available to pay for the projects. This plan reports on the performance of the transportation system based on the TPB's regional analysis. This enables the region to set priorities and develop strategies to maintain, improve, and enhance the system.

The organization of the plan generally aligns with the basic steps of the transportation planning process as shown in Figure 1.1.

Figure 1.1: Visualize 2045 Update — Chapters



The Regional Planning Process

The region works together in an ongoing fashion to plan and implement the multimodal transportation system. As the Metropolitan Planning Organization (MPO) for the region, the TPB's plan implements the federally required 'continuing, cooperative, and comprehensive' transportation process. This plan was developed to communicate about the region's plans for the transportation system and meet all federal requirements for the region's LRTP. The federal requirements are described at the end of this chapter. A summary of the roles and responsibilities of transportation planning in the region is shown in Table 1.1.

How Can You Use Visualize 2045?

All: The Visualize 2045 update provides a unique opportunity to hear quotes from the Voices of the Region that recollect personal experiences and opinions to better understand the needs and concerns of the public.

TPB: Members can use this plan as a resource and policy document. Learn more about the federally required long-range transportation planning process and how and why this process is important for local jurisdictions and residents. Consider how and where in each jurisdiction's planning and policy processes the jurisdiction or agency can act toward the goals, strategies, and aspirations shared by the region.

Technical Staff: Staff to TPB members can use this plan as a resource to share within their jurisdictions, to learn more about the TPB's federally required processes, or answer questions about regional transportation planning. This plan can be shared at community meetings or local planning meetings to support implementation of the plan's strategies.

The Public: This plan provides educational materials including data, maps, historical context, and current conditions for the public to learn more about the region and the role that the TPB plays in the transportation planning process. This plan can be found online through the Visualize 2045 website. It is hoped the Voices of the Region narratives encourage more people to get involved in the TPB's public engagement opportunities.

Organizations: The Visualize 2045 update provides both policy and objective technical information such as data, maps, and survey results that local organizations can use to inform research efforts within the region and to promote or support implementation of the plan. This plan also includes the TPB's Aspirational Initiatives, and other strategies that organizations can promote, support, implement, or build upon.

WHAT IS A LONG-RANGE TRANSPORTATION PLAN?

Federal laws require that the region's long-range transportation plan contains the region's collective long-term plans to fund, operate, maintain, and expand the transportation system within a minimum planning horizon of 20 years. The plan is updated at least once every four years. The plan must demonstrate that the forecasted emissions produced by the future transportation system comply with air quality requirements.

WHAT IS A TIP?

The federally required Transportation Improvement Program (TIP) provides the schedule for the next four years for distributing federal, state, and local funds for state and local transportation projects. The TIP represents an agency's intent to construct or implement projects and identifies the anticipated flow of federal funds and matching state or local contributions. TIP projects include those that are in the first four years of the plan, plus other project types that use federal funding, such as roadway and transit maintenance projects, and operational programs.

Developing Visualize 2045

The TPB staff update Visualize 2045 with input from the TPB members, their technical staff, and the public. The TPB staff also coordinate with the Metropolitan Washington Council of Government's (COG) staff that lead work for community planning, the environment, and security. To address the many technical and planning requirements, staff must begin work on the plan more than two years prior to its federal due date. A new plan must be submitted to the federal government every four years. Figure 1.2 illustrates the timeline and major activities for the Visualize 2045 update. The TPB has integrated the results of the TPB Climate Change Mitigation Study of 2021 into the plan.

Through this plan, the TPB applies an equity lens in all its work and conducts planning activities using an integrated planning approach to work toward shared regional goals, with a renewed emphasis on safety and climate resilience.

Public Engagement: Voices of The Region

The TPB conducts two comment periods as part of the plan update and receives public input for the TPB's regular meetings. For the Visualize 2045 update, the TPB conducted public engagement known as Voices of the Region to gather information about public opinions and engage residents in a regional virtual activity about the TPB's Aspirational Initiatives. Voices of the Region provides a more nuanced understanding of how regional transportation policies affect people in our region and highlights voices that have been underrepresented in the past. As you read each chapter, look for public input in magenta Voices of the Region boxes. Learn more about TPB's public engagement in Chapter 5. **See the Voices of the Region on Visualize 2045 website** or **experience the Story Map to learn more.**

Figure 1.2: Visualize 2045 Update — Timeline

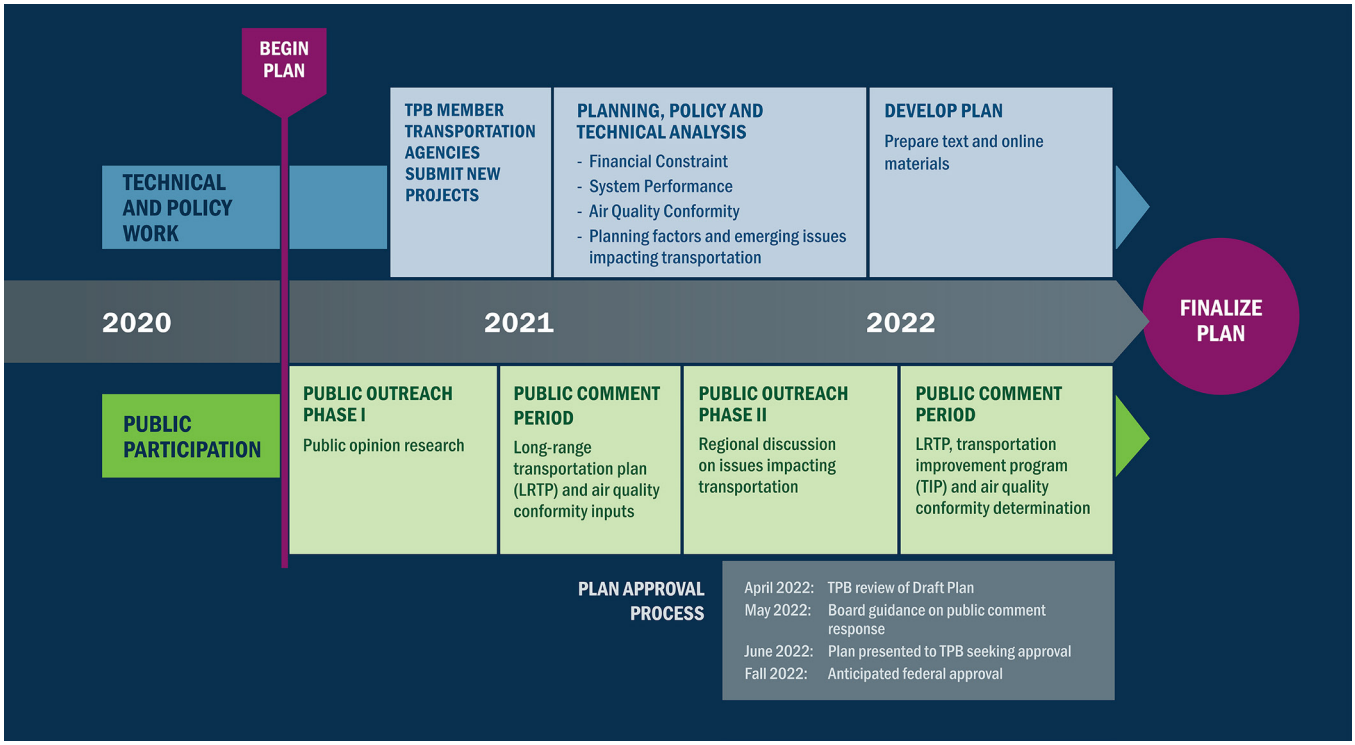


Table 1.1: Planning and Project Development — Typical Transportation Agency Roles

	Federal	State	Local	TPB
Needs Identification	X	X	X	X
Develop Local, State, and Transit Plans for Corridors, Small Areas, TOD		X	X	
Develop, Implement Land-Use Plans				
Project Development, Evaluation of Alternatives	X	X	X	
Project Funding	X	X	X	X [LIMITED]
Project Implementation		X	X	

Project Development

A lot of planning takes place before a project is included in the region's plan. Projects can take a long time—sometimes decades—to plan and develop, and the result can be different than the original project concept. Projects evolve based on local and regional priorities, public input, design and funding limitations, and advances in technology.

Projects in Visualize 2045 are typically developed at the state and local levels. Each state, locality, the District of Columbia, and the Washington Metropolitan Area Transit Authority (WMATA) control their own funding stream. Each jurisdiction has its own system for moving projects forward. New major WMATA capital projects such as stations or lines are built by the jurisdictions that the projects are in—in coordination with WMATA. Within each state, projects may be pursued for a variety of reasons and may have multiple sponsors.

MDOT/Flickr

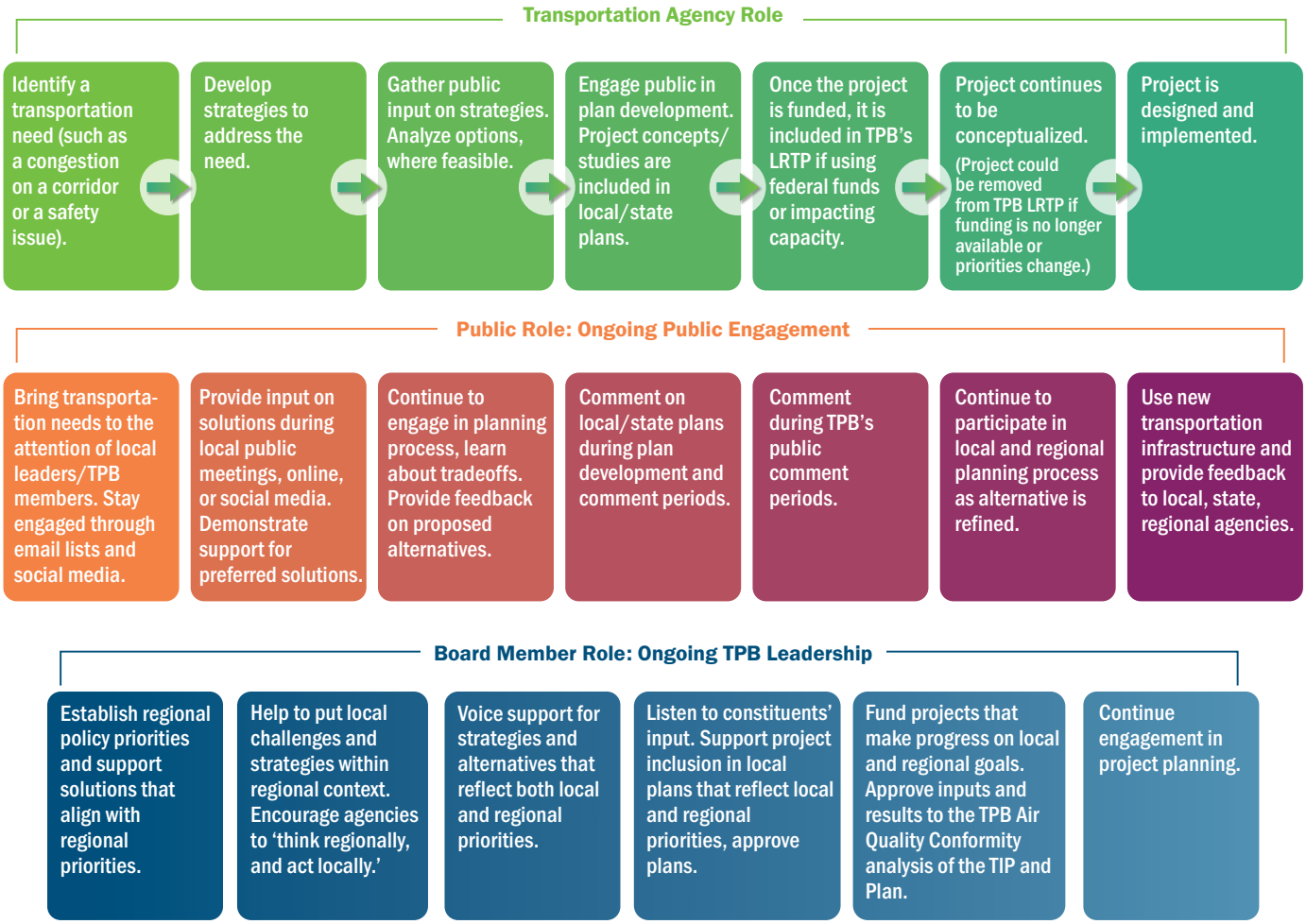
How Does the TPB and the Public Influence the Development of Projects?

The TPB's goals and the federal metropolitan planning requirements influence the types of projects that transportation agencies develop and submit to the TPB for inclusion in the Visualize 2045 update and the TIP. The TPB performance analysis and planning activities such as congestion management, bicycle, pedestrian, freight, safety, management and operations, equity, safety, and resiliency planning inform project development. When projects are submitted, the TPB asks project sponsors to provide responses about if and how the projects advance the TPB's goals. The responses for the projects included in the constrained element (project list) of this plan are available online and are referenced in chapters 6 and 7. Figure 1.3 and the following illustrative example provide a simplified description of how the TPB and the public can influence projects as they are planned and developed, long before projects are submitted for inclusion in the plan.

Illustrative Example

Imagine that a transportation agency is considering how to address congestion on a corridor. The agency would conduct a study to better understand the causes of congestion and the range of options to address the issue. It would then conduct a series of meetings with the public, local businesses, and other stakeholders to get feedback on the challenges, concerns, and possible solutions on the corridor. Discussions might include topics such as environmental health, safety, and improved access and networks for people that bicycle, walk, scoot, and take transit.

Figure 1.3: The TPB and Public's Influence on Project Development



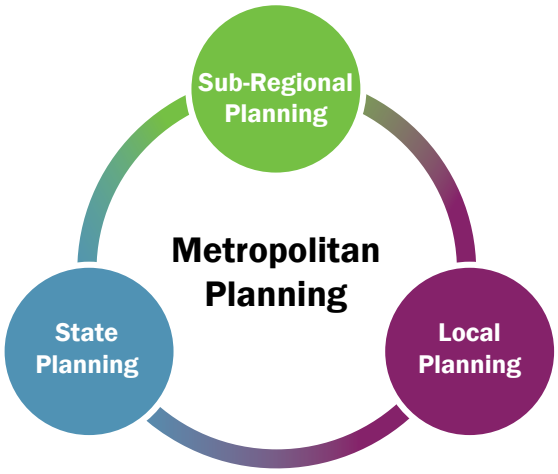
The agency would consider local goals, and regional goals, priorities, and preferred strategies endorsed by the TPB, such as the Aspirational Initiatives. It could review proven and innovative practices as discussed during TPB subcommittees. It would consider the regional analysis that the TPB provides on congestion, and the many strategies documented through the TPB's Congestion Management Process (CMP), such as Travel Demand Management (TDM) solutions or implementing intelligent transportation system (ITS) solutions that help make traveling in the corridor more efficient.

As the project concept advances, the agency would consider a range of alternatives and there would be additional public meetings where officials and the public could offer feedback. The agency would consider enhancements to the project, such as green infrastructure to manage stormwater, increased transit features, and improved connections for people that walk and bike. The project would be included in a local plan. Once funding is identified, if required, the project would submitted to the TPB for inclusion in the region's plan and Air Quality Conformity analysis. The project may still go through a decade or more of additional planning and design. The project might be required to undergo additional required analysis, such as federally required analysis that cannot be conducted unless the project is included in the plan.

Identifying Needs

The TPB conducts numerous studies and analysis to identify regional transportation needs. Project-specific needs are identified through a variety of mechanisms throughout the region. Here are some basic ways in which projects originate:

- **State-level long-range transportation planning:** Each state has a long-range planning process that brings together project recommendations from different sources. A project does not have to be in a state long-range plan, but priorities established in these plans often determine which projects get implemented. State and WMATA long-range plans usually are not financially constrained and may or may not list individual projects.
- **State-level project identification:** State departments of transportation (DOTs) each have



methods for identifying projects. In accordance with state law, the states give highest priority to maintenance needs or structural deficiencies. States also identify projects as they implement the federally mandated performance-based planning and programming approach (PBPP) (learn more in Chapter 8, Planning for Performance). The states propose other projects that are system "enhancements" including trails or landscaping, or projects to serve air quality improvement goals, such as park-and-ride lots or ridesharing programs. In other cases, the states recommend "new capacity"—new or widened roads, or transit extensions—these projects must be in the TPB's plan.

- **Regional plans and studies:** WMATA regularly assesses the needs of the Metrorail, Metrobus, and MetroAccess systems, and identifies new service and projects. WMATA places a priority on keeping the system in a state of good performance, including replacement of rail cars and buses, escalator and elevator repair, and track maintenance. WMATA also studies and identifies system enhancements, such as bus service improvements and station access improvements. The Maryland Transit Administration (MDOT-MTA), the Virginia Department of Rail and Public Transportation (DRPT), and local agencies perform their own studies and work with WMATA. The Northern Virginia Transportation Authority (NVTA)

oversees the production of an unconstrained plan, TransAction. During the Six Year Program, projects identified in TransAction are selected for NVTA funds through an evaluation process that results in a consolidated candidate project list for public input. Other agencies, such as the National Capital Planning Commission (NCPC) and The Maryland-National Capital Park and Planning Commission (MNCPPC), also produce plans for parts of the region.

- **Local government plans:** Many transportation projects are often first identified through local planning, which is performed by county or municipal governments. Local comprehensive plans usually include a transportation element identifying specific projects that a local government has determined will be needed over the period of the plan, which is usually 20-25 years.
- **Corridors and sub-area studies:** Federal regulations require corridor or sub-area studies, with public involvement, to be performed when major metropolitan highway or transit investments are being considered. Corridor and sub-area studies typically examine the costs and benefits of various alternatives, and how effectively the different options would "get the job done." They also measure other social, economic, or environmental impacts.

What Types of Projects are in the Visualize 2045 Project List?

The TPB has a broad set of transportation goals, and every day a large portfolio of work is underway throughout the region to help make progress on those goals. This work includes moving forward a variety of transportation projects and programs, as well as transportation and land-use policies.

Federal law requires some projects to be included in a specific part of Visualize 2045—what is referred to as the 'constrained element' of the plan. This is simply a list of projects that is a subset of all the transportation work in the region, limited by certain requirements. Typically, the projects in the constrained element are regionally significant road and transit improvements, although these projects often include many other components, such as freight, bicycle, and pedestrian enhancements. To receive federal funding, regionally significant projects must be included in the constrained element project list.

Roughly a year before the full plan is approved, the TPB approves the projects that will be included in the constrained element (CE) as inputs for the regional Air Quality Conformity analysis. This plan references many of these projects, each has an identification number that starts with CE (or T, for TIP projects) followed by four digits. At this point in the process, these projects must show a level of specificity, even if construction is many years away. Sponsors must demonstrate that project funding is reasonably anticipated to be available (this requirement for financial constraint is what gives the constrained element its name). And the details of the projects in the constrained element must be geographically detailed enough to allow them to be coded and modeled as part of the regional air quality analysis, which shows that the plan is forecast to conform to regional air quality improvement budgets.

What types of transportation activities are not included in the constrained element project list? This can include projects that do not yet have funding, that will be required to be in the air quality analysis once they are funded. Other project types and strategies that are not federally required to be in the constrained element include standalone trail projects, small pedestrian projects, or electric vehicle infrastructure.

Projects do not have to be in the constrained element to be important to the region. Regional transportation goals are reflected in an array of projects, programs, and priorities that are implemented by TPB member agencies, but for various reasons are not required to be included in the constrained element. Regional priorities are also emphasized and implemented through a range of TPB policies and programs, such as the TPB-endorsed Aspirational Initiatives and the TPB technical assistance programs. See Table 1.2 for examples of how projects and policies are implemented within and beyond the constrained element project list.

Table 1.2: Implementing the TPB's Vision — Examples of Projects in and Beyond the Constrained Element of Visualize 2045

Project, Program, or Policy Type	Implementation
State of Good Repair	***In the Constrained Element:*** Taking care of the region's expansive existing transportation system is fundamental and ongoing. The LRTP must identify the maintenance and operations programs and funding required to keep the highway and transit systems in a state of good repair. An example project (component) is the replacement of the American Legion Bridge (part of T6432).
Bicycle and Pedestrian Projects • ASPIRATIONAL INITIATIVES: - National Capital Trail Network (NCTN) - Improve Bike/Walk Access to Transit	***In the Constrained Element:*** Many bicycle and pedestrian projects are integral parts of larger roadway or transit projects that impact the capacity of the transportation system or receive federal funding and therefore are in the constrained element. Examples include the Grant Avenue Road Diet (CE3375) and the side paths that Prince William County includes on the Virginia Route 28 widening project (CE3219). Both projects complete segments of the NCTN. ***Beyond the Constrained Element,*** transportation agencies in the region implement many bicycle and pedestrian projects, many of which are documented in the TPB Bicycle and Pedestrian plan and in local plans. An example is the pedestrian HAWK signals installed in 2021 on Wisconsin Avenue in Bethesda, MD.
Transit Lines, BRT, Bus-Only Lanes, Bus and Metro Car Fleets, Metro Improvements • ASPIRATIONAL INITIATIVES: - Expand BRT and Transitways - Move More People on Metrorail	***In the Constrained Element:*** Examples include new and replacement transit vehicles, fare policies, new transit stations, and system expansion projects that add new lines and service. Converting a vehicular travel lane to a bus only or bus/bike lane would also be in the constrained element, such as the H&I bus lanes (T3212). Illustrative studies may appear in the financial plan but would not be included in the Air Quality Conformity analysis.
Expressways and interstates, State Roads, Ramps • ASPIRATIONAL INITIATIVE: - Expand the Express Highway Network	***In the Constrained Element:*** Projects and policies that change the capacity or function of major roadways are reflected in the constrained element. The MDOT I-270 Innovative Congestion Management project (T6444) is an example.
Local Roads and Local Intersection Improvements	***In the Constrained Element:*** Local roadway projects that impact the region's roadway capacity such as a new, expanded, or reduced roadways (road diets) must be included even if the project does not use federal funding. An example project is the Loudoun County Route 50 /North Collector Road (CE3739) that is planned as a multimodal road and future transit corridor. ***Beyond the Constrained Element:*** Most local roadway projects do not impact the region's roadway capacity and do not use federal funding; therefore, they are not reflected in the constrained element.
Land-Use Coordination • ASPIRATIONAL INITIATIVE: - Bring Jobs and Housing Closer Together	***In the Constrained Element:*** Many transportation projects in the constrained element are designed to improve connections between housing and job centers. The AQC analysis must use approved population and forecasts for 2045, not aspirational targets. ***Beyond the Constrained Element:*** The planning and authority for the land-use aspect of the initiative, Bring Jobs and Housing Together, is within the purview of the planning agencies. Land-use projects, programs and policies are not reflected in the constrained element, but the TPB works closely with land-use planning partners as coordination is a critical transportation strategy.
Travel Demand Management • ASPIRATIONAL INITIATIVE: - Provide More Telecommuting and Other Options for Commuting	***In the Constrained Element:*** Many travel options represented by TDM, such as transit projects, or carpool lanes on expressways, are represented in the constrained element. ***Beyond the Constrained Element:*** Telework programs and teleworking amounts in the region impact the demand on the transportation system. These programs are not directly reflected in the constrained element of the LRTP.

Where Can You Get More Information About Transportation in the Region?

TPB Planning Activities

The TPB leads many planning efforts that inform the planning process, plan development, and the projects, programs, and policies that its members fund and implement in the region. Chapter 6, Strategies for a Brighter Future, and Chapter 8, Planning for Performance, describe these activities.

Visit the Visualize 2045 website to learn more about TPB planning activities.

TPB's Aspirational Initiatives

Learn more about the TPB's Aspirational Initiatives in Chapter 6, Strategies for a Brighter Future. **Visit the Story Map or see the videos and infographics online.**

Safety Planning

To better understand the factors behind the unacceptable numbers of fatalities and serious injuries occurring on the region's roadways each year, the TPB commissioned a Regional Safety Study guided by a regional panel. The TPB adopted a regional roadway safety policy in 2020 and established a new safety program. This policy endorsed a set of shared actions to reduce injuries and fatalities on area roadways and committed to safety strategies that advance equity.

Transit Planning

The TPB conducts studies and reports to support transit planning in the metropolitan Washington region, such as transit service and fare equity analysis and annual system reports. See the TPB BRT infographic and video.

Bicycle and Pedestrian Planning

The TPB is updating its Bicycle and Pedestrian Plan in 2022. This plan is an update to the Bicycle and Pedestrian Plan which was adopted in 2015. The plan identifies major bicycle and pedestrian projects to be implemented and incorporates goals and performance indicators for walking and bicycling based on the TPB Vision. The Vision plan identifies "recommended practices" likely to be effective in achieving those goals, and discusses trends in policy, mode share, and safety.

Freight Planning

The National Capital Region Freight Plan examines freight movement in the region and summarizes current and forecasted freight conditions. The freight plan includes 17 policies that provide a framework for transportation planning activities conducted by the TPB. The TPB member jurisdictions are also encouraged to consider these freight policies as they conduct their respective transportation planning functions. An update to the 2016 plan approved by the TPB is underway as of 2022.

Travel Demand Management: Commuter Connections

Many of the strategies in the Visualize 2045 update represent Transportation Demand Management (TDM) approaches, which are intended to help people find and use alternatives to driving alone. TDM uses marketing, incentives, and employer-based programs to reduce congestion and improve air quality. Commuter Connections is the TPB's TDM program. The Commuter Connections regional network provides commuter services and information to area residents and employers in the metropolitan Washington region to reduce traffic congestion and emissions caused by single occupant vehicles (SOVs).

Environmental Planning

Through Air Quality Conformity analysis, the TPB coordinates with its partners to meet federal planning requirements for established pollutants in the air known to be harmful to people's health. TPB staff forecast emission levels of these pollutants from vehicles to ensure the LRTP and TIP comply with the region's plan to meet national air quality standards. The TPB also partners with COG and its members on issues of environmental mitigation and works to address climate change by identifying and evaluating strategies to reduce roadway greenhouse gas (GHG) emissions and to ensure resiliency of the transportation system.

Other Transportation Planning Activities in the Region

By the time projects are included in TPB's constrained element project list of the plan, they have undergone a significant amount of review through state and local planning and outreach activities. Projects in the first few years of the plan are often under construction. This section provides information on ways to have a voice in transportation planning earlier in the planning process.

State, Local, and Transit Planning

Each state, local jurisdiction, and transit agency in the TPB's membership conducts transportation planning activities beyond what can be represented in this plan, and each develop their own long-range transportation plan. Localities develop strategic and comprehensive plans that include transportation elements and many produce standalone transportation plans. These all inform the projects, programs, and policies that members implement in the region. A subset of those projects and policies are required to be submitted to the TPB for the constrained element of the LRTP and the TIP per federal requirements related to the Air Quality Conformity analysis. While the TPB's vision is comprehensive and multimodal, it is not possible for the Air Quality Conformity analysis to include all projects, but only those projects required for the analysis.

Joe Flood/Flickr

The number and variety of state and local plans provide opportunities to learn about what is happening in the region beyond the constrained element project list.

To Learn More About Planning and Projects and How Your Voice Can Be Heard:

Review the plans developed by the states, localities, and transit agencies in the region, and provide input when they are updated. A few of these plans include:

- **State of Maryland Long-Range Transportation Plan**
- **District of Columbia, Long-Range Transportation Plan**
- **Commonwealth of Virginia Long-Range Transportation Plan**
- **Washington Metropolitan Area Transit Authority Initiatives (including strategic, capital, and service plans)**
- **Northern Virginia Transportation Authority Long-Range Transportation Plan, TransAction**

Identify transportation or land-use planning challenges in the region, and participate in the local process to identify and comment on solutions.

Check out a local jurisdiction's or agency's website or attend a local public meeting to learn more and provide input on plans, goals, projects, programs, policies, and other priorities. **To see a TPB member listing visit: mwcog.org/transportation/about-tpb/jurisdictions.**

Federal Requirements

Like plans that came before, federal requirements govern and inform the content and process for development of this update to Visualize 2045. This plan meets all federal requirements. The two main requirements are that the plan must identify all regionally significant projects and programs for which funding is reasonably expected to be available over a 20-year horizon and demonstrate that these projects and programs together comply with regional air quality improvement goals. This Visualize 2045 update must meet an array of federal requirements, including but not limited to: complying with performance-based planning rules, considering the ten federal planning factors, conducting a Congestion Management Process, engaging in public participation, responding to concerns of non-discrimination and equity. **A summary of requirements follows, and more details are available online.** ***Appendix K contains a full checklist of requirements and how this plan update fulfills them.***

Continue reading to learn more about these requirements by visiting the Federal Register website.

Financial Constraint

Federal regulations require that the TPB develop an element of the long-range transportation plan that is financially constrained. Each project included in this element must be completed using revenue sources that are already committed, available, or reasonably expected to be available in the future (financial constraint). The forecasted system performance of the projects in the financially constrained element illustrates how the projects work together to affect future travel patterns and conditions. In doing so, this element paints a picture of what can be attained with the existing funding level and mix of projects. This information can be used by elected leaders, regional planners, and the public to better understand decisions needed to realize a more desirable transportation future.

Air Quality Conformity

The federal government requires the TPB to conduct an in-depth analysis to ensure projected emissions generated by users of the region's future transportation system will not exceed (or "conforms to") the air quality

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emissions budgets set forth in the region's air quality plans. This is known as Air Quality Conformity. Based on the results of the analysis, a determination is made to confirm the region is meeting the required targets. The major highway and transit projects in the constrained element can be found in Chapter 7, Funding the Transportation System. Certain types of projects must be included in the Air Quality Conformity analysis and the financial analysis of the plan, which is how the TPB demonstrates there is sufficient funding for the listed projects. These include:

- Projects that add or remove roadway or transit capacity could affect air quality. These include system expansion projects like new or widened roadways, new transit lines or bus only lanes, or expanded transit service on existing lines. Because of that effect, they are required to be in Visualize 2045 and part of the "Air Quality Conformity" test.
- Transit service and fare assumption policies that will affect the operation of the transportation system and could therefore affect travel patterns and air quality. This includes new or updated route, frequency, and fare policy information for the region's rail and bus systems, as well as new or updated lane restrictions and hours of operation for HOV and HOT facilities.

Land-Use: Cooperative Forecasts

The Visualize 2045 update presents and analyzes land-use considerations, acknowledging that where and how the region grows can be a key transportation strategy. There is a demonstrated link between land-use, economic vitality, and transportation. Many TPB studies have examined that relationship to develop and promote strategies such as Activity Centers and growth around high-capacity transit stations. However, the TPB cannot use visionary or aspirational land-use plans in the required air quality analysis, but rather must rely on the land-use data that is provided to COG from member localities from approved comprehensive plans. Learn more about COG's cooperative forecast in Chapter 2, 'Where Are We Today?'.

Performance-Based Planning and Programming (PBPP)

Performance-Based Planning and Programming (PBPP) is a federal requirement that requires states and MPOs to "transition to a performance-driven, outcome-based program that provides for a greater level of transparency and accountability, improved project decision-making, and more efficient investment of federal transportation funds." To accomplish this, the PBPP process ties the funding of projects and programs to improving measured performance and achieving targets set for future performance.

Kelly Bell/Flickr

WHAT IS A REGIONALLY SIGNIFICANT PROJECT?

'Regionally Significant' projects in the Air Quality Conformity analysis are defined as capital improvements that add or remove highway or transit capacity and therefore might affect future air quality.

Congestion Management Process (CMP)

The TPB serves an important role in addressing congestion and providing for safe and effective management and operation of the transportation system in the region. This is done by conducting analyses and providing information for members' awareness of congestion trends and potential management strategies which TPB documents in the federally required Congestion Management Process (CMP).

Public Participation

The TPB's Participation Plan communicates the TPB's commitment to convey transparent information and engage the public and relevant public agencies to support the regional transportation planning process. This includes the process to update Visualize 2045, and the TIP. Learn about the Participation Plan by clicking below:

TPB Participation Plan | Metropolitan Washington Council of Governments (mwcog.org)

Transportation for Persons With Disabilities or Low Income, and Older Adults

As required through Title VI of the Federal Civil Rights Act, and in consideration of best planning practices, the TPB must ensure it enables ongoing participation from low-income and minority communities, persons with disabilities, and those with limited English skills. It must also develop a Coordinated Human Service Transportation Plan for the National Capital Region.

Federal Planning Factors

Federal law identifies a list of planning factors meant to guide metropolitan planning. Collectively, the projects, programs, and policies in Visualize 2045 must address these factors.

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
2. Increase the safety of the transportation system for all motorized and non-motorized users.
3. Increase the ability of the transportation system to support homeland security and to safeguard the personal security of all motorized and nonmotorized users.
4. Increase accessibility and mobility of people and freight.
5. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
7. Promote efficient system management and operation.
8. Emphasize the preservation of the existing transportation system.
9. Improve resiliency and reliability of the transportation system, and reduce or mitigate stormwater impacts of surface transportation.
10. Enhance travel and tourism.

Jonathan Cutrer/Flickr

Mike Maguire/Flickr

2

CHAPTER

Where Are We Today?

This chapter describes the regional context in which the TPB and its members plan for the region's transportation system. This includes a description of the region's geography, demographics, and existing and projected population and jobs. It reflects on the current cultural, social, and environmental conditions that impact the planning and use of the transportation system. This section also describes the transportation system and services that support the region.

"Regional context" is not just about technical data and reporting. The Voices of the Region public outreach includes quotes, findings, and survey responses from people living in the region about their use and opinion of the transportation system.

Voices of the Region

"I think [transportation] it's not just about moving people and buses and cars and trains from Point A to Point B, but it's how people actually experience these things and experience the stations and what makes you feel safe architecturally versus not feel safe. Blind spots, weird corners...we need to think in the big macro terms of moving people and goods from one place to the other, but we also think about how we experience those things as people. Whether we're young, whether we're older, whether we're physically able, whether we're physically challenged, and try to think a little bit beyond that immediate 'this is faster, this is more efficient, this is cheaper.'"

— Resident, Olney MD

Current Issues: COVID-19, Equity, and Climate

During the development of this plan, the region faced a global health crisis and a call for racial justice that transformed people's lives and the region. The region faces the challenges of adapting to a changing climate while continuing to work together to mitigate climate change impacts. The COVID-19 pandemic highlighted significant inequities in health outcomes that continue to affect daily lives and the public transportation system, particularly for marginalized communities. The response to the death of George Floyd and others called on the nation to reconsider what racial equity and anti-racism truly look like. Temperatures and the water surface level in the Potomac River have been rising and will continue to rise.[1] In addition, a regional climate risk and vulnerability assessment found that climate change will increase the frequency or severity of heat, drought, flooding, lightning and thunderstorms, and extreme winter conditions.[2]

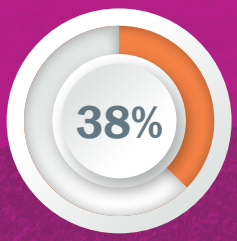
The TPB recognizes the Visualize 2045 update comes at a critical turning point in history. During the COVID-19 pandemic, the region saw drastic changes in economic activity and travel behavior, with reduced driving and transit use and more people walking, biking, and teleworking. How long these pandemic-related changes in behavior will continue or to what extent they will impact long-term planning remains to be seen. There will be a transition period to a "new normal" as people integrate lessons from the pandemic into their life choices. The TPB will continue to monitor transportation demand through surveys and system use to inform future plans.

While the TPB has worked for many years to address these challenges, in 2020, the TPB passed three resolutions to reaffirm the region's commitment to advance equity, climate, and safety initiatives. Read about these resolutions in Chapter 3, Visualizing our Future Together.

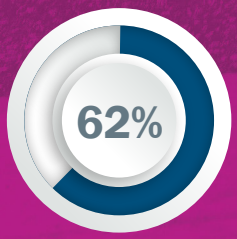
Voices of the Region
ON TRAVEL HABITS

The Voices of the Region survey gathered information on attitudes and behaviors related to how COVID-19 has affected their views on the region's transportation system and asked them to consider scenarios as occurring one year after the COVID-19 pandemic is over.

One year after the pandemic is over, 38% of respondents said they will probably have different travel habits, while 62% said they expected to go back to the same travel habits as before. Over half of those who expected their travel would be different said they would walk more than before the pandemic (53%).



Plan to have different travel habits post-pandemic.



Expect to resume same travel habits as pre-pandemic.

See more survey responses on the Visualize 2045 Voices of the Region webpage.

1 Metropolitan Washington 2030 Climate and Energy Action Plan. November 2020. MWCOG; mwcog.org/documents/2020/11/18/metropolitan-washington-2030-climate-and-energy-action-plan/

2 Ibid

Voices of the Region

ON EQUITY:

"When I do my consulting work or my catering, sometimes I go to far Northeast Washington. Buses are few and far between, the waiting times run 45 to an hour and fifteen minutes. That is inequitable. The more affluent areas have more transportation options, more lines, more frequency, where the lower income areas do not and they probably depend on transportation—public transportation even more."

— Resident of Hyattsville, MD

ON CLIMATE AND SAFETY:

"I'd say in a perfect world I would ride my bike a lot more than I do now. For me, the issue is certain areas I just don't feel safe riding it. But if there were safer bike trails and that sort of thing, I would certainly use that as my first choice."

— Resident of Arlington, VA

ON CLIMATE AND PUBLIC HEALTH:

"I look at it like if you're in an airplane you can't help somebody else if you don't take the oxygen first. And so you need to be healthy in order to be able to work in the environment for positive results."

— Resident of the District of Columbia

Voices of the Region

Through focus group discussions, residents shared their own personal experiences with transportation equity, safety, and its relationship to climate change, then reflected on their own thoughts and opinions with others from similar backgrounds. While there were some similarities, there were also differences that allowed the focus group participants to learn as well as share their own stories. It is clear that one's experiences with equity, safety, and climate change varies on the individual level. However, these hot topics have affected almost every participant in some way. For transportation equity, an overwhelming majority of participants expressed that they felt the regional transportation system was inequitable in some fashion. The causes ranged from issues such as rising costs and reliability to geographic location. Safety was a consistent theme throughout the focus groups that participants could speak about openly. For safety, participants shared many experiences in which they have felt unsafe using transportation, hesitated to use certain modes due to safety, or suggested ways to improve safety within the system. Lastly, climate change was a topic that varied based on how familiar participants were with the topic as it relates to transportation or whether they recognized it as an issue. Many participants shared their own suggestions for ways to prepare the region for a greener transportation system, as well as their thoughts about new technology such as driverless cars.
Read our Focus Group Report.

The National Capital Region

The National Capital Region comprises approximately 3,500 square miles and spans the spectrum of settlement patterns: urban, suburban, exurban, and rural. The region is one of the most affluent in the country, with an annual median household income of nearly $106,000 and a gross regional product of over $561 billion per year.[3]

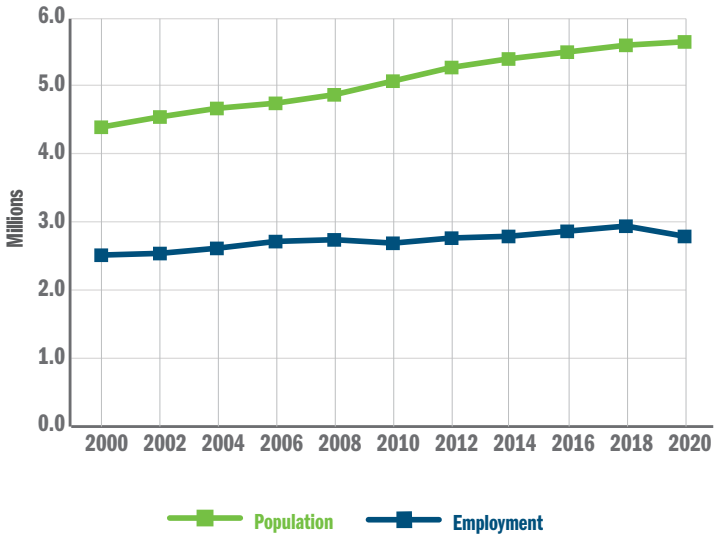
This economic strength is due in large part to a consistently strong job market that, even during the COVID-19 pandemic, is driven by the federal government and the robust service sector that recovered much of its job losses or could shift to telework. The difference in laws, government structures, and financial resources of Maryland, Virginia, and the District of Columbia creates a complex policy environment. The region's large size and range of development patterns lead to diverse transportation needs. For these reasons, regional transportation planning and decision-making must balance a wide array of needs and priorities.

Recent Trends

Over the past few decades, the National Capital Region's healthy economy has fueled consistently strong population and job growth, and that trend is expected to continue well into the future. Since 1970, the region's population has nearly doubled, and the total number of jobs in the region has grown at an even faster rate.[4]

According to the U.S. Census, from 2000 to 2020 the region steadily gained over one million residents from 4.4 to 5.6 million people. Total regional employment has grown by almost 284 thousand jobs from 2000 to 2020, although the recession of the late-2000s slowed the growth and resulted in reductions in regional employment for a few years (Figure 2.1).[5] More recently, the COVID-19 pandemic contributed to a loss of 371,000 jobs from March to April 2020, followed by a recovery of 318,000 jobs by October 2021.

Figure 2.1: Population and Employment in Millions of the National Capital Region, 2000 - 2020 (Source: Population Figures: U.S. Census Bureau, Population Division, Annual Estimates of the Resident Population, Employment Figures: U.S. Department of Labor, Bureaus of Labor Statistics, Quarterly Census of Employment and Wages)



3 U.S. Census Bureau, 2019 American Community Survey and Bureau of Economic Analysis
4 U.S. Census Bureau, as cited in 2014 Constrained Long-Range Plan
5 U.S. Department of Labor, Bureau of Labor Statistics, Quarterly Census for Employment and Wages, 2021

Chesapeake Bay Program/Flickr

Forecast Growth

Where and how the region grows impacts the transportation options, congestion levels, and quality of life for the people in the region. According to the latest data from COG's Cooperative Forecasts, there are 5.7 million people living in the National Capital Region and, by 2045, that number is expected to increase to over 7 million, an increase of 23 percent (Figure 2.2). Fairfax County (including City of Fairfax and City of Falls Church) and the District of Columbia will gain the most residents, by 252 thousand and 258 thousand, respectively.

The number of jobs in the region will grow from 3.4 million today to 4.3 million by 2045, an increase of 26 percent (Figure 2.3). Fairfax County (including City of Fairfax and City of Falls Church) and the District of Columbia, the jurisdictions with the most forecasted job growth, are expected to gain 196 thousand and 199 thousand jobs, respectively.

Housing availability and affordability is a growing problem in the region. As noted in the COG report *The Future of Housing in Greater Washington,* "There is an imbalance between the number of jobs and the amount of housing available to the workforce. This situation affects the area's affordability, potentially undercuts its appeal to new companies and talent, strains the transportation system, and impacts the environment and quality of life for the region's residents. For some, this means not only long commutes to work, but also difficult choices between paying rent or affording other basic necessities such as food or medicine."[6] With employment expected to grow at a faster rate than the population, if housing growth cannot keep up with the rate of employment growth, more and more people will have to commute into the region from outside. This type of commuting pattern puts a heavy load on the region's roads and transit systems as trips become longer and more congested.

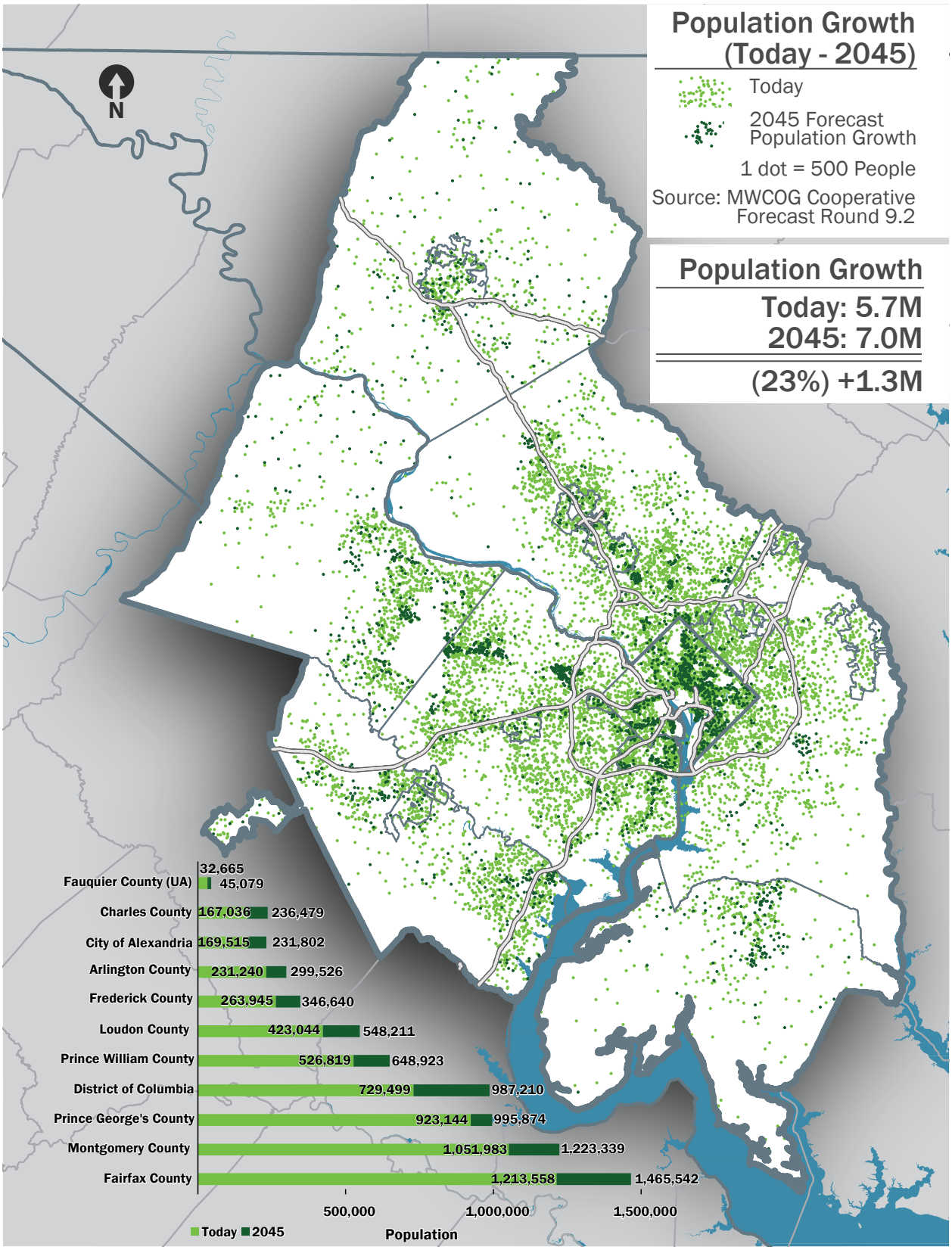
Working closely to align regional transportation policy and land-use policies, the TPB and regional leaders are committed to finding solutions to the regional housing and job imbalance. One approach is to encourage greater concentration, circulation, and connection of residential and commercial developments in mixed-use Activity Centers and near high-capacity transit, places optimal for future growth. See Chapter 6 for more information.

HOW DOES COG FORECAST HOUSEHOLDS AND EMPLOYMENT?

The COG Cooperative Forecasting Program uses common assumptions about future growth and development, including local land-use plans, to forecast jobs, households, and population. The program combines regional data, which are based upon national economic trends and regional demographics, with local projections of population, households, and employment. These local projections are based on data about real estate development, market conditions, adopted land-use plans, and planned transportation improvements. The Cooperative Forecasting Program is used extensively by the TPB staff in modeling travel demand and emissions.

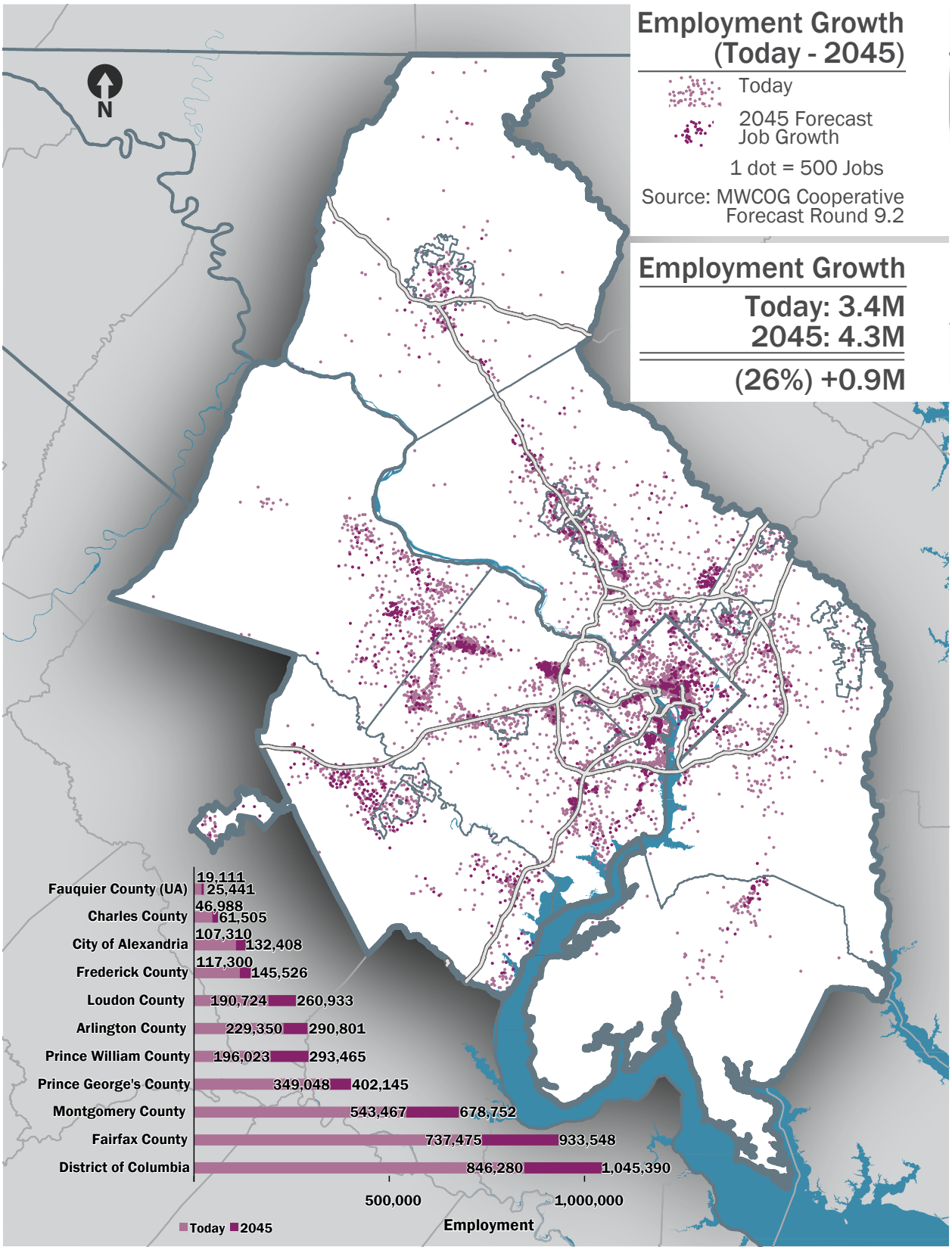
6 The Future of Housing in Greater Washington: A Regional Initiative to Create Housing Opportunities, Improve Transportation, and Support Economic Growth. September 2019; http://www.mwcog.org/documents/2019/09/10/the-future-of-housing-in-greater-washington/

Figure 2.2: Forecast Population Growth in Millions, Today – 2045* (Source: MWCOG Cooperative Forecast Round 9.2)



*Fairfax County data includes data for the cities of Fairfax and Falls Church. Prince William County data includes data for the cities Manassas & Manassas Park.

Figure 2.3: Forecast Employment Growth in Millions, Today – 2045* (Source: MWCOG Cooperative Forecast Round 9.2)



*Fairfax County data includes data for the cities of Fairfax and Falls Church. Prince William County data includes data for the cities Manassas & Manassas Park.

Understanding "Density" in the TPB Region

To help make progress toward the TPB's transportation and land-use goals and get more out of the investments made in existing transportation infrastructure, the TPB calls upon regional leaders to promote policies that "Bring Jobs and Housing Closer Together." A TPB priority is focusing new development to support population growth in Activity Centers and near high-capacity transit station areas (HCTs). Doing so can expand travel options and make for shorter trips in vibrant walkable communities.

By analyzing census block group and COG's cooperative forecast transportation analysis zone data, the TPB can monitor progress and better understand where new growth has been occurring in our region through the 'population-weighted density' concept. This concept reflects the density experienced by a resident of the region based on where they live. For example, people living in concentrated clusters, like Activity Centers, experience density greater than in other parts of the region. This metric can help determine where to preserve open space or invest in transportation infrastructure that depends on density to succeed, such as a transit line that requires high ridership to be feasible. See Figure 2.4 to see how density has changed in the metropolitan Washington region from 2010 to 2020 with census block group data and Figure 2.5 for how COG's cooperative forecast transportation analysis zone data estimates density to change.

Since 2010, much of the region has undergone some form of increased density. High-capacity transit station areas and Activity Centers saw the greatest increase between 2010 and 2020, with 31 percent, and 21 percent increases, respectively. According to census data, in 2020, residents of the region, as a whole, experienced density at a little over 10,000 people per square mile. In Activity Centers, experienced density was much higher than the region, at over 14,000 people per square mile. In HCT station areas, it was two times greater than the region as a whole—more than 21,000 people per square mile.

Conducting this analysis using COG's cooperative forecast data for 2020 and 2045, the region anticipates densification trends to continue. The region, Activity Centers, and HCT Station Areas will all become denser at similar rates, at or just above 40 percent. Those rates lead to higher density forecasts within HCT Station Areas and Activity Centers, greater than 26,000 and 38,000 people per square mile, respectively. This data suggests that development policies are focusing growth consistent with COG and TPB priorities and reflecting historical growth patterns.

Figure 2.4 Population Weighted Density in the Region, 2010 and 2020 (Source: Staff Analysis of 2010 and 2020 U.S. Decennial Census Block Groups)

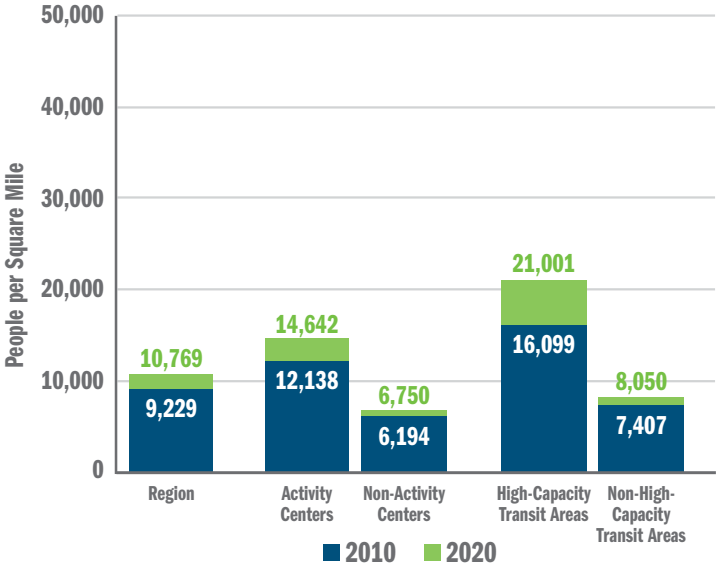
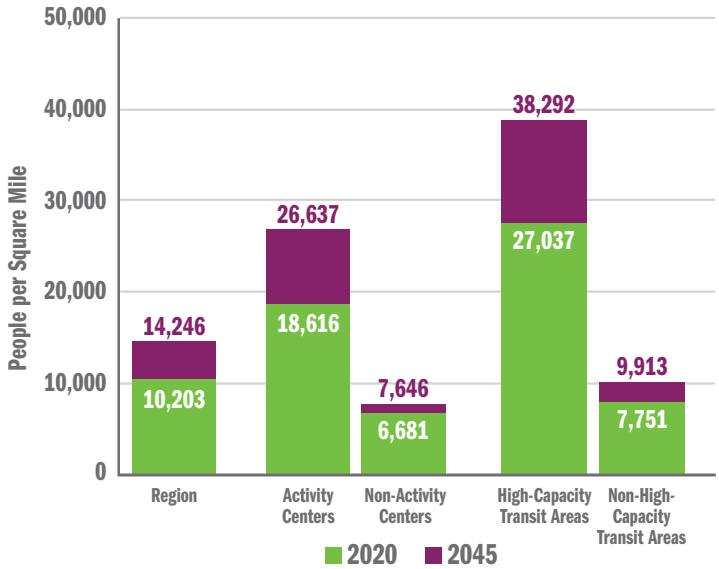


Figure 2.5 Population Weighted Density in the Region, 2020 and 2045 (Source: Staff Analysis of COG Round 9.2 Cooperative Forecast Transportation Analysis Zones)



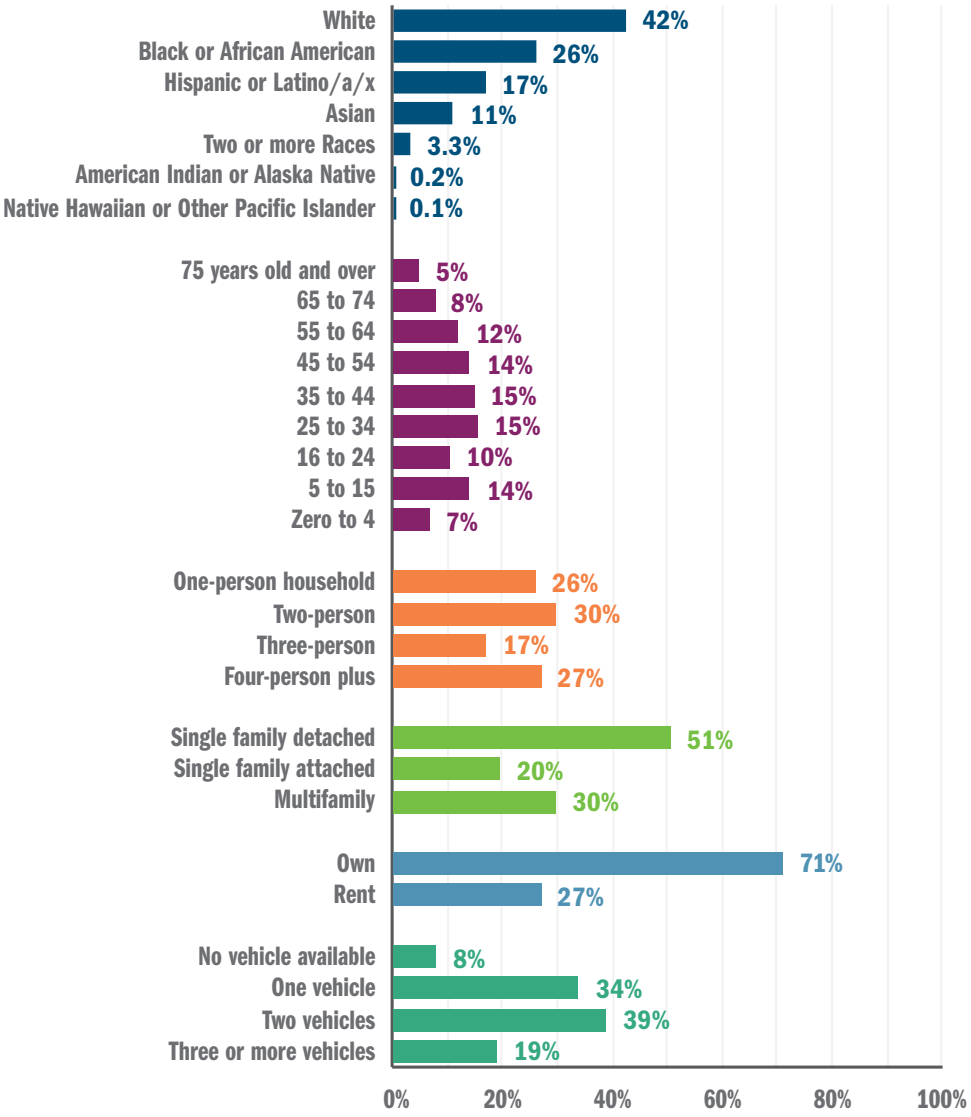
Demographics

The National Capital Region is a dynamic and diverse metropolitan area. According to data from the U.S. Census, it is a highly diverse region, less than half (42 percent) non-Hispanic white, followed by 26 percent African American, 17 percent Hispanic/Latino/a/x, and 11 percent Asian. In terms of age distribution, the largest age groups are between 25-34 and 35-44 (15.5 percent and 14.7 percent, respectively). There is slightly larger proportion of females (51.3 percent) compared with males (48.7 percent). Nearly one-quarter (23 percent) of the region's households earn less than $50,000 a year.[7]

Analysis of regional household travel data collected in 2017-2018 identifies important findings in household size, type and tenure, and vehicles. These figures have important implications for land use and transportation plans, programs, and policies as the region determines the needs of residents.

There are currently 2.1 million households in the TPB region. The largest household size group in the region are two-person households (30 percent), followed by households with four or more persons (27 percent), one-person (26 percent) households, and three-person households (17 percent). About 70 percent of households live in single-family housing (51 percent single family detached, 20 percent single family attached homes, such as row houses) and 30 percent live in multifamily housing, such as apartment buildings. Over two-thirds of households own their home (71 percent) while just over one-quarter of households live in rental housing (27 percent), the remaining 1.7 percent is categorized as other. In terms of vehicle availability, 34 percent of households have one vehicle, 39 percent have two vehicles, and 19 percent have three or more vehicles. About eight percent of households do not have a vehicle (Figure 2.6).[8]

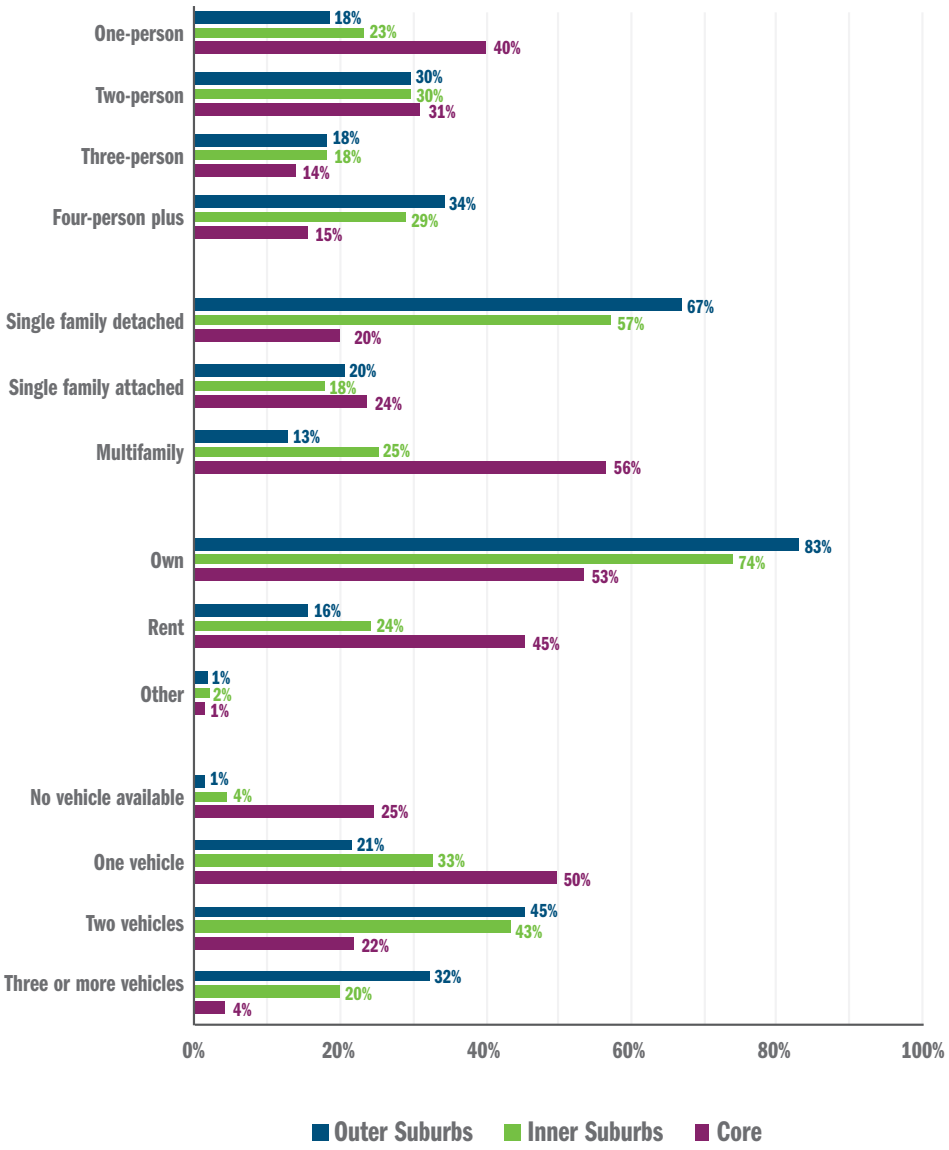
Figure 2.6: Summary of Characteristics in the National Capital Region, Percent of Population (Source: U.S. Census Bureau, 2015 – 2019 American Community Survey 5-year estimates, 2017/2018 TPB Regional Travel Survey)



7 U.S. Census Bureau. American Community Survey (ACS) Public Use Microdata Sample (PUMS), 2015-2019 5-Year Estimates

8 National Capital Region Transportation Planning Board, 2017/18 Regional Travel Survey; mwcog.org/transportation/data-and-tools/household-travel-survey/

Figure 2.7: Detail of Household Characteristics in the National Capital Region, Percent of Population, 2017/2018 (Source: 2017/2018 TPB Regional Travel Survey)



Important trends in household characteristics present themselves when examining the difference between the region's core, inner-suburban, and outer-suburban geographies. One-person households comprise the highest share of households in the core; two-person households make up the highest share of households in the inner and outer suburbs. The share of one-person households decreased across the entire region, most notably in the core. For housing type and tenure, more than half of residents in the core live in multifamily housing and nearly half of core residents live in rental housing. The share of residents living in single-family detached housing decreased and the share of residents living in multifamily and rental housing increased in the core and inner suburbs since 2007/08. About one-quarter of households in the core have no vehicle available, which increased since 2007/08 (Figure 2.7).[9]

9 National Capital Region Transportation Planning Board, 2017/18 Regional Travel Survey; mwcog.org/transportation/data-and-tools/household-travel-survey/

The Regional Transportation System

Planning for the future transportation system is built on the patterns of past growth, development, and infrastructure investment. When considering the total job and residential locations expected in 2045, about **80 percent** of those are already in place in the region. Visualize 2045 adds to and enhances the region's already extensive transportation network but to preserve past investments **about 28 percent** of funds go to system maintenance.

An integrated and extensive rail and bus transit system and a connected system of highways and priced toll lanes comprise the high-capacity backbone of the transportation system. In addition, extensive infrastructure for bicyclists and pedestrians, as well as provisions for bike sharing, ridehailing, and car-sharing services, allow for a wide range of options throughout the region.

Within its boundaries, the region is served by:

- **>17,000 lane miles of highways and major roads**, more than 500 miles of which are tolled lanes.
- **129 miles of Metrorail** and **91 Metrorail stations**.
- **173 miles of MARC and VRE commuter rail** and **39 commuter rail stations**.
- **37 miles of bus rapid transit, light rail, and streetcars**, with more to come.
- **800+ of miles of off-street paved trails** and paths for walking and biking.
- **400+ miles of bike lanes**.
- **>19,000 directional miles of important freight corridors** within the TPB's planning area carrying more than 300 million tons of goods annually.
- **Two Class I railroads**—CSX Transportation and the Norfolk Southern Corporation which **operate 250+ miles of mainline track** and carrying more than 47 million tons of local freight annually.
- **852** EV Charging Stations **2,424** and EV plugs.
- **15+ local and commuter bus systems** and about **10 paratransit service providers**.
- **Nine intercity train stations** and an estimated **14 intercity bus stations**.
- **Three major airports** with extensive domestic and international connections, **Ronald Reagan Washington National Airport (DCA)**, **Baltimore/Washington International Thurgood Marshall Airport (BWI)**, and **Washington Dulles International Airport (IAD)** that also carry significant levels of freight cargo.

Planning, building, operating, and maintaining this infrastructure is handled by a long list of public agencies that have oversight over different aspect of the process, as well as private companies providing transportation services. These include:

- The **Maryland Department of Transportation (MDOT)**, the **Virginia Department of Transportation (VDOT)**, the **Virginia Department of Rail and Public Transportation (DRPT)**, and the **District Department of Transportation (DDOT)**, which control major transportation planning and funding decisions in their respective jurisdictions.
- Other **regional transportation planning and funding agencies**, including the **Northern Virginia Transportation Authority (NVTA)** and the **Northern Virginia Transportation Commission (NVTC)**.
- The **city and county governments** that make local decisions on transportation and land-use.
- The **Washington Metropolitan Area Transit Authority (WMATA)**, with a service area of 1,500 square miles, providing Metrorail, Metrobus, and paratransit services.
- Dozens of **local bus, commuter bus, and paratransit operators** that serve specific cities and counties in the region.
- **Amtrak**, the national rail system, and the **MARC and VRE commuter rail systems**.
- Numerous **private taxi companies** and a growing number of **smartphone-based ridehailing applications**.
- Services such as **Uber** and **Lyft** that operate throughout the region.
- **Capital Bikeshare** and other **private companies that provide bicycles and scooters** for short-term rental.
- Multiple **car-share companies**, such as **car2go** and **Zipcar**, that allow short-term vehicle rental.
- Multiple **micromobility companies that offer shared scooters, bicycles, and e-bicycles** in many of the urban and denser suburban parts of the region.
- Numerous **firms of all types that depend on freight transportation** for their business.

Travel Patterns/Behavior in Metropolitan Washington

How Does TPB Get Data On Transportation System Use and Travel Patterns?

The TPB gathers data through several types of surveys on the use of the transportation system. Much of the data in this update to Visualize 2045 are data from three recent surveys: the Regional Travel Survey (RTS), the State of the Commute Survey, and the Voices of the Region. The TPB also cites data from public and private sources such as the U.S. Census, or Capital Bikeshare usage as reported by the company that manages that system. Following is a description of the three of TPB's surveys:

Regional Travel Survey (RTS): The TPB has conducted a RTS approximately every 10 years since 1968. The survey, which collects demographic and travel information from a randomly selected representative sample of households in the TPB region and adjacent areas, is the primary source of observed data used to estimate, calibrate, and validate the regional travel demand model. The TPB uses the model for travel forecasting and an Air Quality Conformity analysis of the region's long-range transportation plan as well as to support other key program activities. Staff use the survey to analyze regional travel trends and TPB member jurisdictions and agencies use them to inform their transportation-related studies.

The RTS creates a better understanding of the household characteristics and persons in the region and their daily travel and activities, like, how, why, where they travel, how long it takes, and what they do upon arrival. The survey seeks to obtain a complete picture of travel patterns in the region.

State of the Commute Survey: Commuter Connections' State of the Commute (SOC) Survey and associated report have been produced every three years since 2001. It tracks a wide range of transportation information and assistance services designed to inform area commuters of the availability and benefits of alternatives to driving alone and help them find alternatives. In 2020, TPB's Commuter Connections Program conducted an Employer Telework Survey to examine telework experience and changes in teleworking implemented by the employers during the COVID-19 pandemic.

Beyond DC/Flickr

Voices of the Region: The Voices of the Region survey was a representative regional survey of residents in the TPB planning area that gathered information on attitudes and behaviors related to transportation topics. The study focused on topics that will be addressed in this plan including equity, future technologies, and climate change. It also asked respondents about how COVID-19 affected their views on the region's transportation system and how the system can serve them better.

Other surveys: TPB may conduct other surveys to gather information to support transportation planning for the metropolitan Washington region as needed.

Geoff Livingston/Flickr*

Trips and Mode Share

Through the RTS, the TPB monitors the regional totals for trips by type and mode. Approximately 17 million trips are taken per day on all modes of transportation for all purposes, including travel to work, school, medical appointments, and other destinations. Of those trips, 41 percent are people driving alone, 38 percent are in a vehicle with two or more people, 11 percent are by walking or biking, 6 percent are by bus or rail transit, and the remaining 5 percent use taxi/ridehail, school bus, and other services (Figure 2.8).[10]

Over the past 10 years, shares of single occupancy vehicle trips and carpool trips for all purposes have remained steady. For commute trips, shares of single occupancy vehicle and carpool trips decreased while other modes such as bus transit, walk, bicycle, and taxi/ridehail increased. Following this trend, the share of single occupancy vehicle trips will likely continue to decline as additional transit services come online, as bicycle and pedestrian infrastructure continues to grow, and land-use policies push for the concentration of jobs and households in regional Activity Centers (Figure 2.9).

The TPB monitors the regional totals for trips by type and mode. As discussed in the previous section, land-use correlates with transportation options and mode choice.

Figure 2.8: Mode Share of All Types of Trips, 2017/2018 (Source: 2017/2018 TPB Regional Travel Survey)

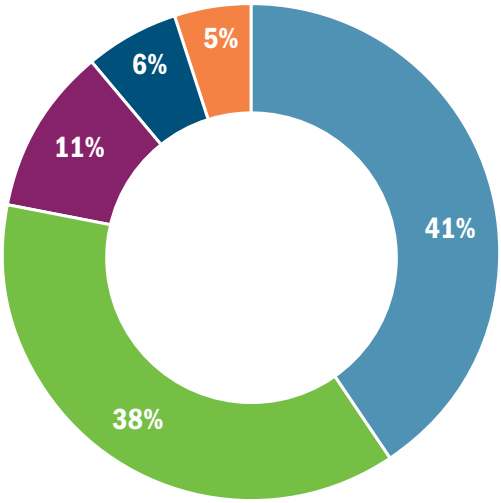
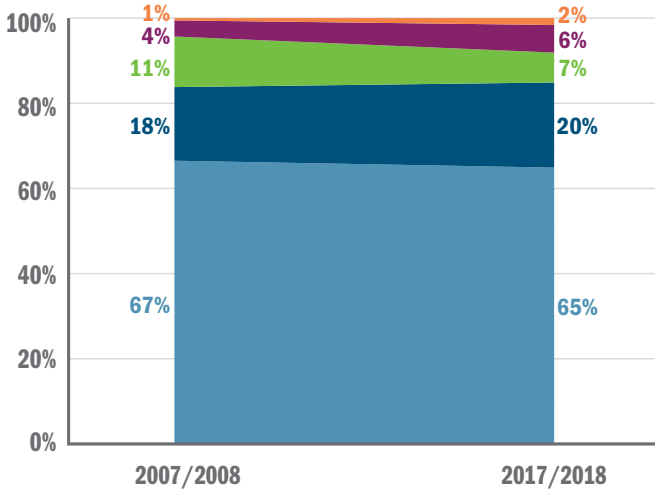


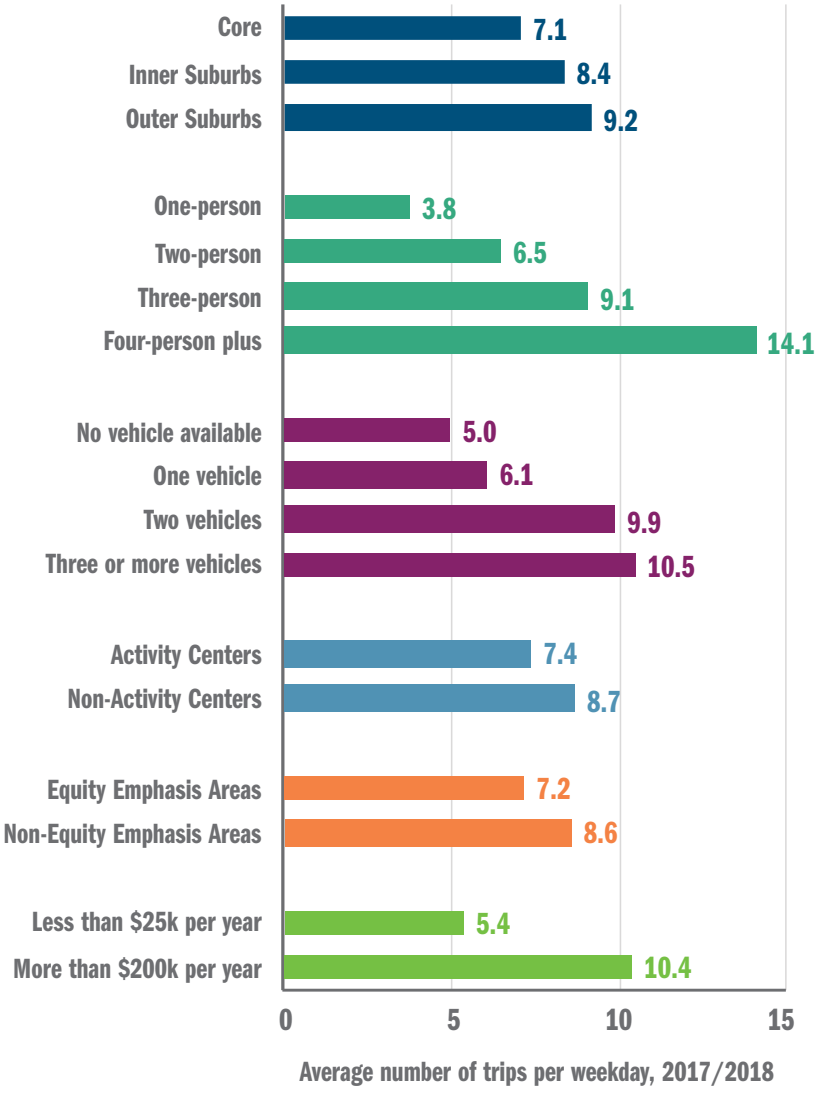
Figure 2.9: Change in Mode Share of Commute Trips, 2007/2008 – 2017/2018 (Source: 2007/2008 and 2017/2018 TPB Regional Travel Survey)



Drive Alone | Drive with Two or More People | Walk and Bike | Bus or Rail Transit | Other (Taxi/Ridehail, School Bus, and Other)

10 National Capital Region Transportation Planning Board, 2017/18 Regional Travel Survey; mwcog.org/transportation/data-and-tools/household-travel-survey/

Figure 2.10: Weekday Household Trip Rate (Average Number of Trips Taken per Weekday), 2017/2018 (Source: 2017/2018 TPB Regional Travel Survey)



Change in Trip Rates

Based on the RTS, households in the region are taking fewer trips compared to ten years ago, reflecting a national trend in declining household trip rates. The weekday household trip rate, or the average number of trips being taken per household per weekday in the TPB region, dropped from 8.9 to 8.3 trips since 2007-2008, the last time the data was collected. Comparing different regional geographies, larger decreases occurred in the inner- and outer-suburbs than the regional core. The decline in household trip rates may be partially explained by the rise in online shopping and smartphone app-based delivery services replacing trips to stores and restaurants.

Household size, vehicle availability, and age are key factors influencing the household trip rate, with the largest decreases in the trip rate among larger households, households with two or more vehicles, and persons under 35 years of age. Household size in the TPB region has slightly increased with the decrease in single person households and the increase in three or more person households. The household trip rate also increases with household income, with households earning less than $25,000 a year taking only about half as many trips as households earning more than $200,000 a year. Households in regional Activity Centers and Equity Emphasis Areas (EEAs), census tracts with high concentrations of individuals, communities of color, or both also produce fewer trips on average than outside those geographies (Figure 2.10).[11]

11 Ibid

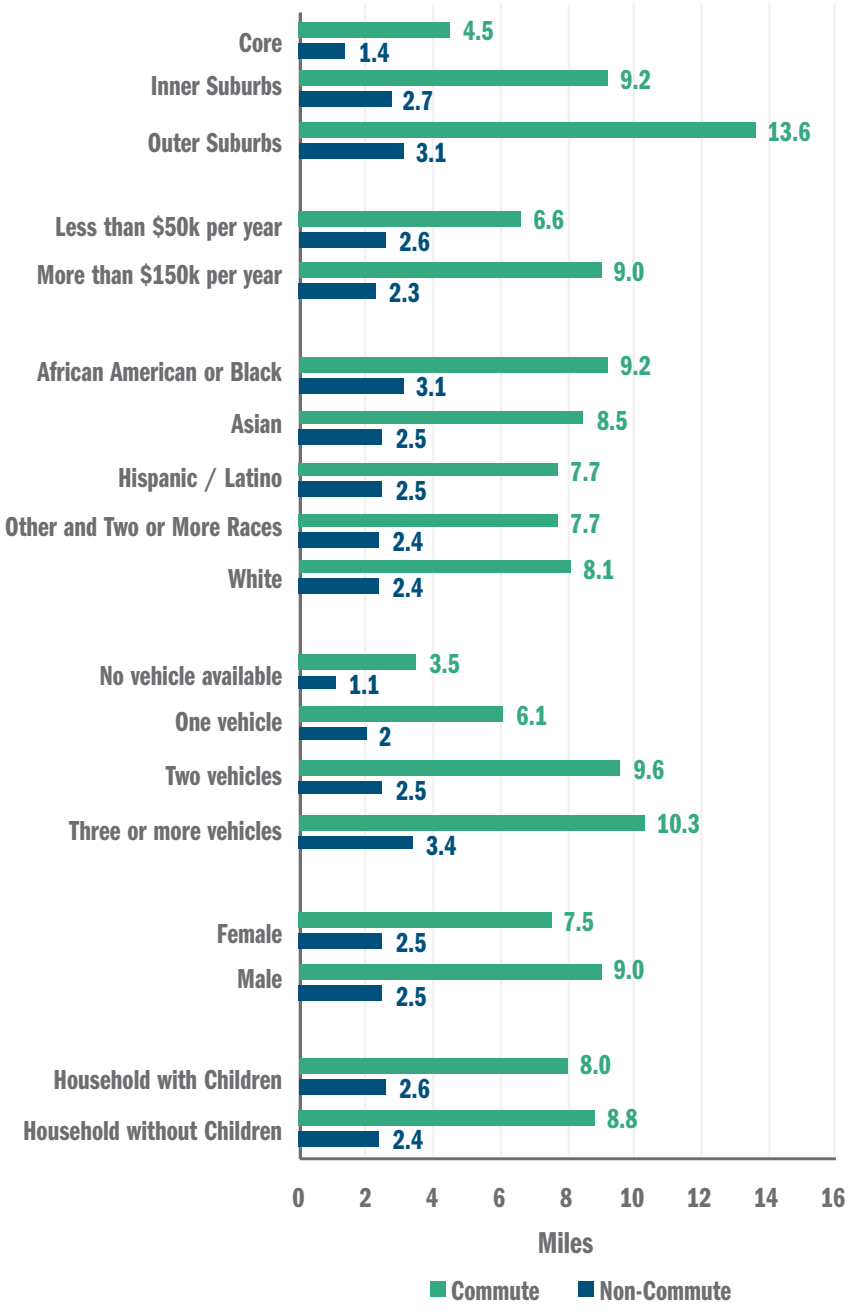
Trip Length

How far residents of the region travel differs on the type of trip being taken, where it is being taken from, and who is taking it. For commute trips, drive alone and rail transit trips have the longest median trip length while rail transit trips are the longest for non-work trips. For trip purpose, commute trips are the longest by distance, followed by work-related, social/recreation, personal business, drop-off/pick-up, shop/meal, and school trips.

Trip length generally increases from the core to the suburbs, with the shortest trip distances in the core and the longest trip distances in the outer suburbs (Figure 2.11). This may reflect differences in land-use patterns since suburbs are more auto-oriented and spatially dispersed than the core. Commute trips are significantly longer than non-commute trips. Commute trip length also increases with household income; the highest income group (over $150,000 a year) has the longest commute distances.

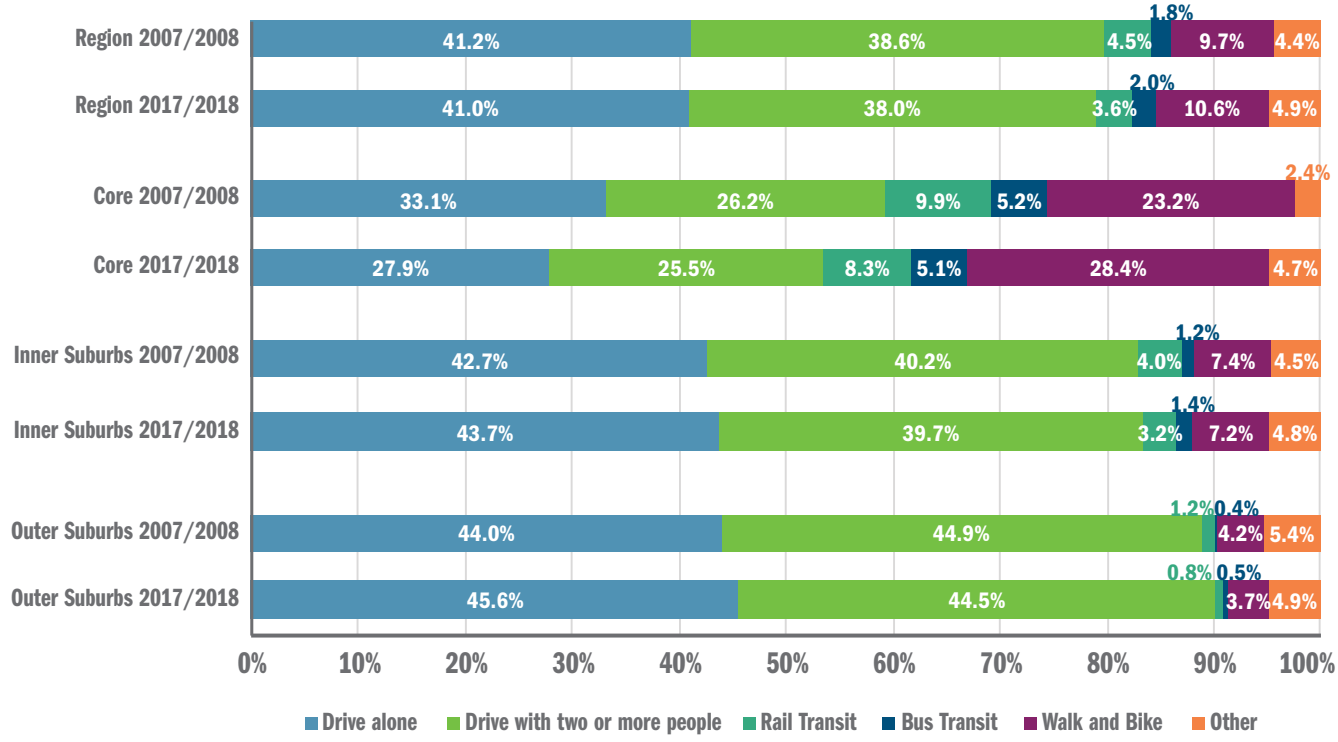
A comparison of trip length by demographic groups found that in terms of race/ethnicity, African Americans take longer trips by distance than other racial/ethnic groups. Trip lengths also increase with vehicle availability, with households with two or more vehicles taking significantly longer trips. This may suggest that households without a vehicle are more geographically constrained in terms of mobility and accessibility in the region. Life stage also influences trip length, with the longest commute trips taken by persons between age 35 and 74, roughly corresponding with members of the Millennial, Generation X, and Baby Boomer generations, while persons under 35 (younger Millennials and Generation Z) take shorter commute trips. Median commute trip distance for males are longer than for females, and households with children have longer trips to work than households without children.[12]

Figure 2.11: Median Household Trip Length in Miles, 2017/2018
(Source: 2017/2018 TPB Regional Travel Survey)



12 Ibid

Figure 2.12: Change in Mode Share of All Trips, 2007/2008 – 2017/2018 (Source: 2007/2008 and 2017/2018 TPB Regional Travel Survey) **due to rounding, figures may not sum to 100%*



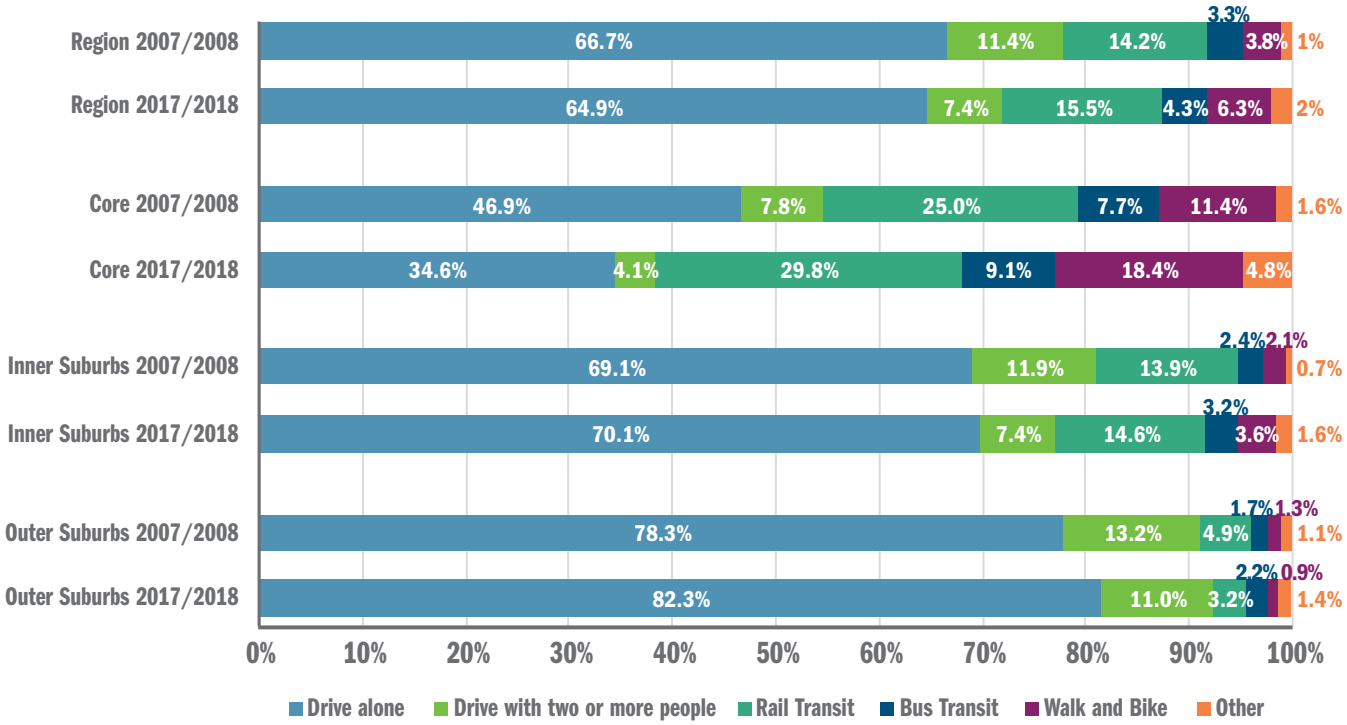
Jeff Vincent/Flickr

Change in Mode Share

All Types of Weekday Trips

According to the RTS, for all weekday trips (work and non-work trips) across the TPB region, the share of personal vehicle trips (drive alone, drive others, and auto passenger) remained steady since 2007-2008, while the share of rail transit trips decreased. However, the share of bicycle and taxi/ridehail trips increased for all trips, although ridehail was introduced in the region after 2007-2008. In the regional core, drive alone trips decreased while walk, bicycle, and taxi/ridehail trips increased as they also did in the inner suburbs (Figure 2.12).

Figure 2.13: Change in Mode Share of Commute Trips, 2007/2008 – 2017/2018 (Source: 2007/2008 and 2017/2018 TPB Regional Travel Survey) **due to rounding figures may not sum to 100%*



Commute Weekday Trips

For work travel, commute trips by personal vehicle significantly decreased between 2017-2018 and 2007-2008, while shares of non-automobile travel modes, particularly bus, transit, walk, bicycle, and taxi/ridehail significantly increased. The regional core had the sharpest decline in trips to work by personal vehicle, while walk, bicycle, and taxi/ridehail trips to work increased. Bicycle and taxi/ridehail commute trips also increased in the inner suburbs (Figure 2.13).

Bicycle trips doubled throughout the metropolitan Washington region, and increased three-fold in the regional core. The share of rail transit trips decreased across the region, especially for non-commute trips. Workers in the region are taking more bus, walk, bicycle, and taxi/ridehail trips, which may reflect increased investment in transit, walk, and bicycle infrastructure in the region and the rise of ridehailing services such as Uber and Lyft.

Use By Mode

Bus and Rail Transit Use

Public transit—including rail, local bus, bus rapid transit, and streetcar— serves all of the jurisdictions in the region and carries a large number of people to their destinations every day. Though transit only carries about 6 percent of all daily trips, twenty percent of all trips to and from work are on public transit.[13] The share of trips to work by bus and rail transit for workers who live in the regional core is 39 percent, exceeding the share of single occupancy vehicle commuters (35 percent). Additionally, the National Capital Region is fifth in the U.S. in average number of transit trips taken per month.[14] In 2019, Metrorail, one of the largest mass transit systems in the country, handled over 600,000 trips per weekday, and the bus systems throughout the region collectively carry over 530,000 trips per weekday (Figure 2.14).[15] Commuter rail services including MARC and VRE carry around 50,000 riders on an average weekday.

13 National Capital Region Transportation Planning Board, 2017/18 Regional Travel Survey; mwcog.org/transportation/data-and-tools/household-travel-survey/

14 National Capital Region Transportation Planning Board staff analysis of 2011-2020 unlinked passenger trips reported in National Transit Database, May 2021 Monthly Module Adjusted Data Release; transit.dot.gov/ntd/data-product/monthly-module-adjusted-data-release

15 National Capital Region Transportation Planning Board staff collection and analysis of weekday ridership estimates reported by the Region's transit operators. Ridership from 2019 is reported due to incomplete 2020 ridership data. Montgomery County Ride On transitioned to rear door boarding only passenger counts systems, typically located in the front of buses, were not being utilized.

Metrorail ridership hit an all-time peak in 2009 and remained somewhat steady in the first half of the decade. Since 2015, overall ridership has declined along national trends in travel patterns. Bus operators have also reported similar drops in ridership over the past few years. Ridership declined sharply after service was reduced due to COVID-19. While some members sheltered and did not use transit, many essential workers continued to use the service. Regional forecasts see this downward trend, including the decrease associated with COVID-19, as temporary. As land-use patterns continue to concentrate jobs and households near new and existing high-capacity transit systems, transit ridership levels are expected to increase.

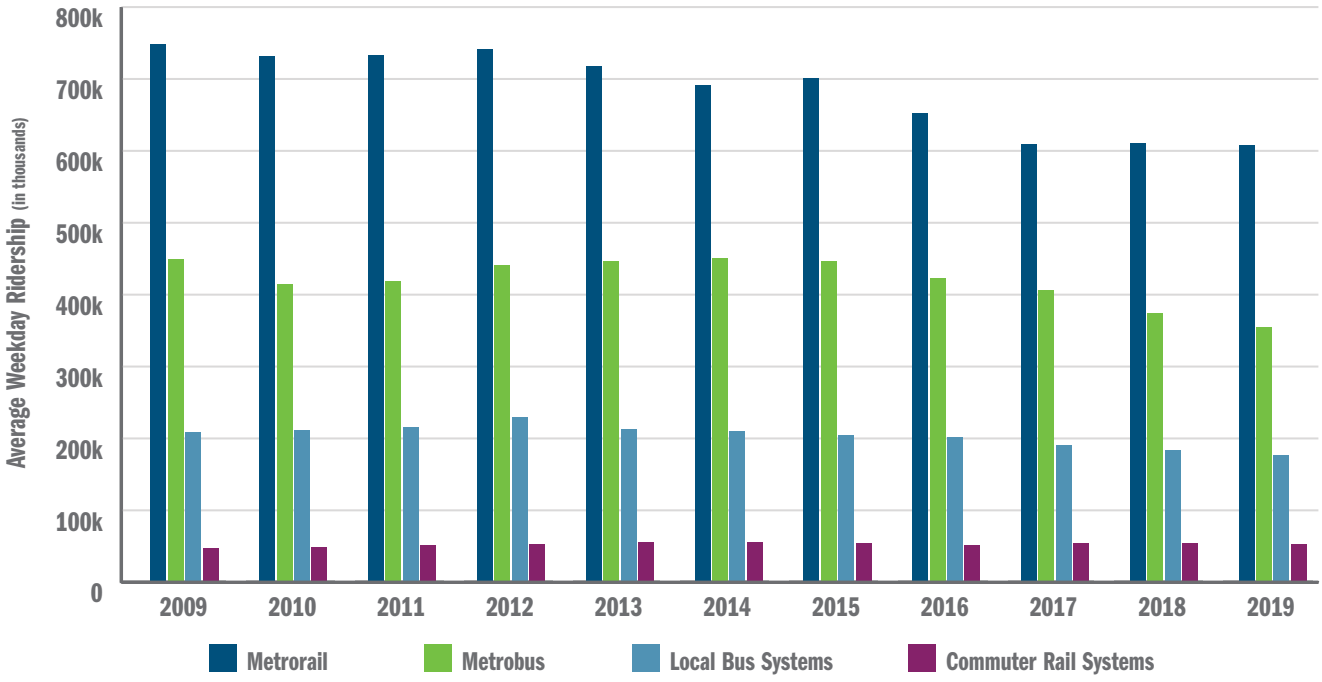
Transit During the COVID-19 Pandemic

In the wake of the COVID-19 pandemic and throughout 2020, local transit services in the National Capital Region faced new pressures operationally, financially, and politically to adapt to a new normal of decreasing ridership, loss of peak travel demand, and related fare revenue losses because of stay-at-home orders and work from home policies implemented across many employers. Simultaneously, service providers quickly adapted to the new public health protocols mandated across levels of government to protect the health and safety of riders and operators. Many local service providers quickly shifted priorities and service levels to balance short- and long-term needs while finding innovative ways to ensure the region's transportation networks remain operational for transit dependent workers unable to telework. A few measures taken by local service providers across 2020 included suspension of fare collection, allowed or mandated rear-door boarding, implementation of social distancing requirements on vehicles, installation of physical barriers between riders and operators, and increased cleaning frequencies of fleets to reduce or prevent the spread of the virus.

Motor Vehicle Travel

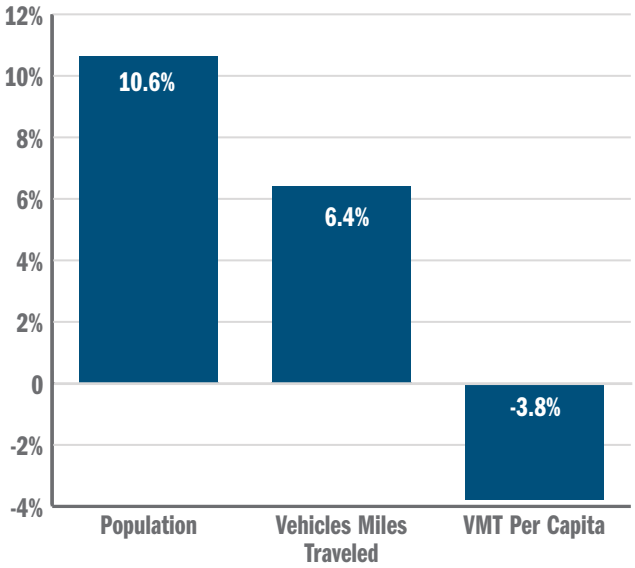
Motor vehicle travel comprises the vast majority of trips taken in the region. As of 2019, vehicles traveled approximately 131 million miles per weekday on average on the region's roadways, which is an increase of 6 percent since 2010.[16] While driving measured in vehicle miles traveled (VMT) has increased over the past nine

Figure 2.14: Transit Ridership Over Time, 2009 – 2019 (Source: TPB Regional Transportation Data Clearinghouse)



16 National Capital Region Transportation Planning Board, Regional Transportation Data Clearinghouse, VMT — Weekday Trends Modeled Region 2005 to 2018; **These estimates do not include the portion of the TPB Planning Region that extends into Fauquier County, VA*

Figure 2.15: Population and Vehicle Miles Traveled (VMT) Changes 2010 – 2019 (Source: U.S. Census Bureau and TPB Regional Transportation Data Clearinghouse, VMT — Weekday Trends Modeled Region 2005 – 2019)



years, it has done so at a slower rate than the 11 percent increase in the region's population over that same period of time.[17] Therefore, the total number of VMT per person decreased by four percent between 2010 and 2019, as more people live in the region and are finding alternate modes to use for their daily travel.

There are approximately 4.1 million vehicles registered in jurisdictions throughout the region, up from 3.6 million vehicles 10 years ago. As of 2020, vehicles classified as light duty trucks (including SUVs) equal the number of light duty cars and motorcycles (1.94 million) on the road, followed by a relatively small number of heavy duty vehicles and buses. The share of hybrid and electric vehicles has been steadily increasing over the past decade. There are currently 159,000 hybrid vehicles registered in the region, which is 3.9 percent of the total fleet, and on top of that there are 23,000 electric plug-in vehicles.[18]

The forecast expects VMT to increase as population and employment figures increase throughout the region, but VMT per person will continue to decline (Figure 2.15).

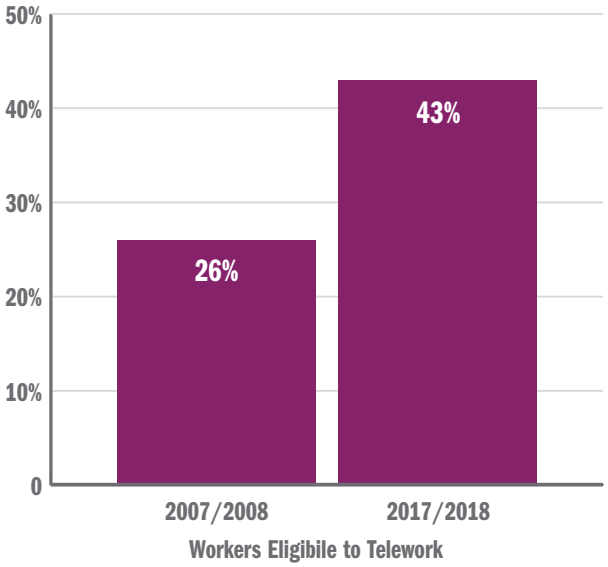
The number of vehicles in the region will also likely increase, and trends indicate that these vehicles will continue to get cleaner and more efficient as time goes on. The TPB tracks the charging stations and individual plugs available that help to make this environmentally-friendly option more practical. As of 2021 there are 852 stations in the region and 2,424 charging plugs, which is an increase of 587 percent since 2012.[19] **Maps that document charging stations locations are available online here.** Increasingly, vehicles will become more connected and more automated, which will make an imprint on the region as new technologies are adopted, although the pace and implications of integration are still largely unknown. See COG's and TPB's work on vehicle electrification planning and connected and automated vehicles in Chapter 6 to learn more.

17 The VMT observed on the region's roadways is reported. It is a developed by summing the product of the amount of daily traffic on each roadway segment by the length of the segment for each segment in the region. This is different than household VMT which is the sum of VMT produced by each household in the region.

18 National Capital Region Transportation Planning Board. September 2021. A Recent Profile of Motor Vehicle Characteristics in Metropolitan Washington; http://www.mwcog.org/file.aspx?&A=2zfN8jFwPUBe5fFOQgJ6XzPND5Vf%2fTkLhftGULncObA%3d.

19 MWCOG. 2020. 2030 Climate and Energy Action Plan; mwcog.org/documents/2020/11/18/metropolitan-washington-2030-climate-and-energy-action-plan/

Figure 2.16: Workers Eligible to Telework, 2007/2008 – 2017/2018 (Source: 2007/2008 and 2017/2018 Regional Travel Survey)



Stock Catalog/Flickr

Teleworking

Many workers in this region telework some of the time instead of physically traveling to their place of employment. According to the RTS conducted in 2017-2018, since 2007-2008 the share of workers who are eligible to telecommute increased from 26 percent to 43 percent in the TPB region (Figure 2.16); the share of workers teleworking one or two days per week also increased.[20] Today, the share of employers that are currently offering telework is higher as many workers rapidly transitioned to teleworking during the COVID-19 pandemic. As more and more workers have the option to work from home, teleworking has changed the landscape of transportation in this region by reducing the total number of people commuting to work. Even when considering the pandemic-fueled growth in telework, there is still potential for even greater increases as more employers offer permanent flexible telework policies. However, the long-term impacts of the pandemic on telework are not yet known.

Taxis and Ridehailing Services

Application-based ridehailing services like Uber and Lyft (also known as transportation network companies or TNCs), has revolutionized for-hire transportation in the region over the past decade. Ten years ago most for-hire services were provided by taxicab and limo companies that operated in separate jurisdictions throughout the region. Now many of those trips are taken via TNCs. While only one percent of all weekday trips in the TPB region are taxi and ridehail trips, they comprise three percent of all weekday trips in the regional core.[21]

Agencies require more data to thoroughly understand how residents and visitors are using TNCs and how the pandemic will impact usage. TNC trips will likely continue to increase as these companies grow and introduce more products and services to entice more riders.

20 2017/18 Regional Travel Survey; mwcog.org/transportation/data-and-tools/household-travel-survey/
21 ibid

Freight Trends and Curb Management

Each year hundreds of millions of tons of freight valued in the billions of dollars move over the region's roadways and railways and pass through its airports, contributing to the economic vitality of metropolitan Washington. Nearly every physical thing, from food to clothes to medicines and furniture, and everything in between was transported on a truck for at least some part of its journey. People increasingly have turned to e-commerce to get goods delivered to their homes; the onset of the COVID-19 pandemic accelerated the trend. Figure 2.17 shows how national e-commerce has increased consistently as a percent of total retail sales.

Bikeshare and Scootershare

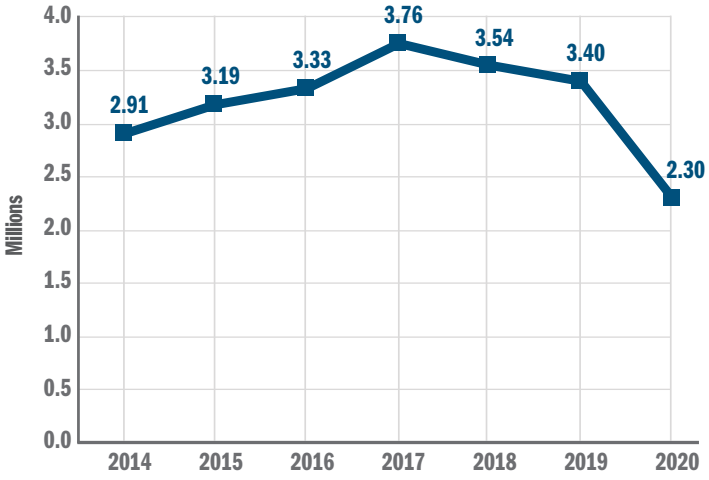
In the past decade, the region has been implementing bikeshare as a mode of travel. Since its inception as one of the nation's first systems of its kind in 2010, Capital Bikeshare has grown from 1,100 bikes at 114 stations in the District of Columbia and Arlington County, to over 4,300 bikes at 550 stations in seven jurisdictions today. By 2017, the number of annual trips taken on the system had more than doubled to over 3.7 million, but ridership has since seen a decline, with nearly 2.3 million reported in 2020. This decline coincides with an eruption of dockless options, including bikes, e-bikes, and e-scooters (Figure 2.18). These options are often referred to as "micromobility". Much of the increase in the share of bicycle trips in the TPB region over the last decade can be attributed to continuous and consistent investment in bicycle infrastructure and bikeshare programs such as Capital Bikeshare.

In 2017, companies began offering dockless bikeshare options. Dockless bikeshare allows users to pick-up and drop off bikes anywhere without needing to park them in specific bike docks. Some companies also offer electric bicycles and electric scooters using the same systems. Riders can lock and unlock the bikes and scooters using applications on their mobile phones. The dockless

Figure 2.17: National Quarterly E-Commerce Sales as a Percent of Total Retail Sales, 2011 – 2021 (Source: Retail Indicators Branch, U.S. Census)

Beyond DC/FLickr

Figure 2.18: Total Annual Capital Bikeshare Trips 2014 – 2020 (Source: TPB Staff Analysis of Capital Bikeshare Data)



bikes have become quite popular among policymakers and residents. In addition, a recent Virginia Tech study suggests that the presence of dockless bikeshare may be helping to address issues of transportation equity since riders on dockless systems are more racially diverse compared to Capital Bikeshare users and are also slightly younger and less affluent.[22]

As Capital Bikeshare increases its reach across the region, and micromobility options such as dockless bikeshare and scooters continue to expand, their use is expected to continue to rise in the coming years. As growth is focused in Activity Centers and HCT station areas, these options are an increasingly important part of the transportation system as they enable car-free travel for short trips and improved access to transit.

Air Travel

Commercial air travel at the National Capital Region's three major airports reached an all-time high in 2019 with approximately 36.8 million airplane boardings (enplanements) reported, up from 32 million in 2007.[23] From 2019 to 2020, enplanements plummeted 65 percent, decreasing from 36.8 million to 12.9 million, at Baltimore/Washington International Thurgood Marshall Airport (BWI), Ronald Reagan Washington National Airport (DCA), and Washington Dulles International Airport (IAD), collectively (Figure 2.19). As the region continues to recover from the COVID-19 pandemic, enplanements are recovering at all three airports but are still well below pre-pandemic levels.

In terms of how passengers access the airports, DCA has the highest rate of access by transit among the three airports, due to its direct connection to Metrorail. Twelve percent of airport travelers reach DCA via Metrorail.[24] Phase 2 of the Metrorail Silver Line extension, which is expected to open in 2022, will provide Metrorail access to IAD and areas beyond.

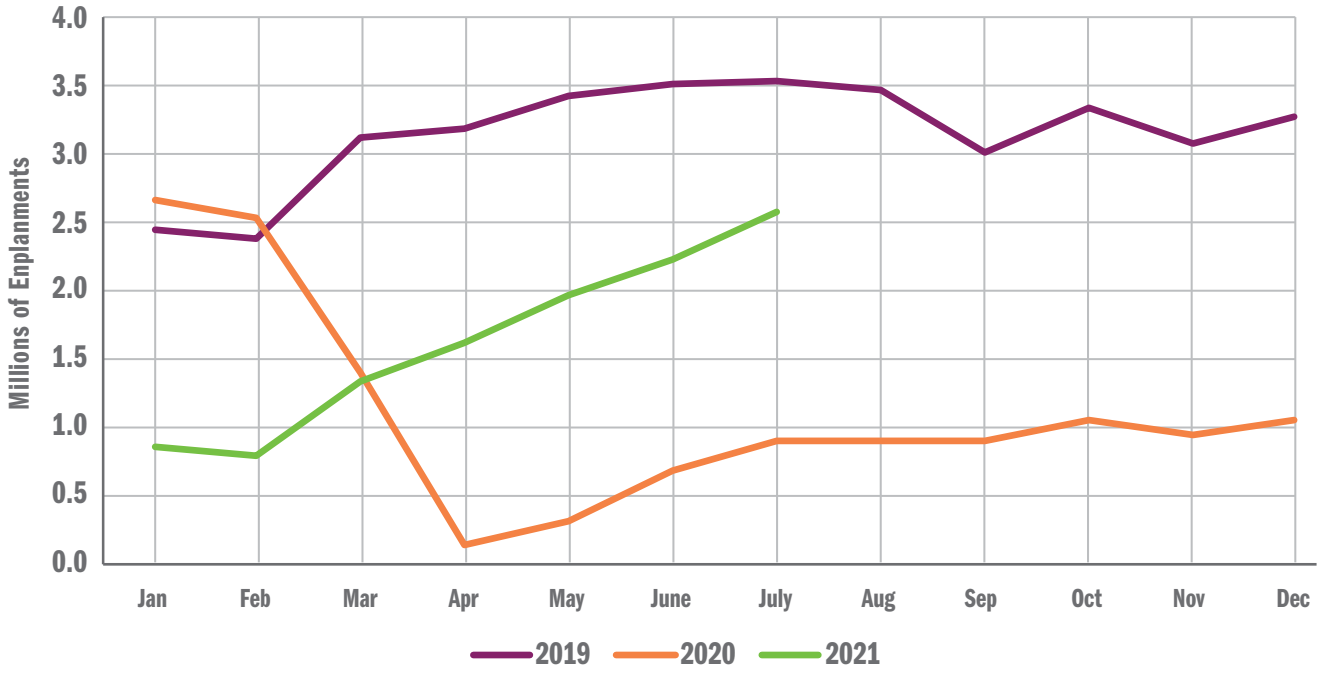
The use of TNCs, such as Uber or Lyft, to access the region's airports continues to grow rapidly. TNC usage is highest at DCA, with 36 percent of passengers, while 22 percent of IAD passengers, and 13 percent of BWI

22 Virginia Polytechnic Institute and State University, D.C. Dockless Bikeshare: A First Look, May 2018.

23 Federal Aviation Administration, Enplanements at all Commercial Service Airports, Calendar Year 2019 Passenger Boarding Data (Final); faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/media/cy19-commercial-service-enplanements.pdf

24 National Capital Region Transportation Planning Board, "Washington-Baltimore Regional Air Passenger Survey, 2019: General Findings," April 2020

Figure 2.19: Monthly Observed Boardings at Three Major Airports, 2019 – July 2021 (Source: Monthly Passenger Boardings, Metropolitan Washington Airports Authority and Maryland Department of Transportation Maryland Aviation Administration; includes revenue and non-revenue passengers)



passengers use TNCs to access the airport. For all three airports, TNC use accounted for 25 percent of ground access trips by airport passengers in 2019, surpassed only by the private automobile, which accounted for 41 percent.[25]

Environmental and Equity Considerations

Many transportation policy topics are interrelated, but few are so closely tied together than environmental and equity implications. Historically, people of color, low-income individuals, and other traditionally disadvantaged populations have experienced unequal treatment and not been included in the decision-making process. Planning has adapted to address that wrong, but there are still challenges ahead.

Transportation Emissions and Air Quality

Transportation planning in the region is heavily influenced by air quality planning, which is a federal requirement. Once the financially constrained element (project list) of the plan is approved by the board, it is tested to ensure that the plan's projects collectively contribute to the air quality improvement goals embodied in the Clean Air Act Amendments of 1990. Using models, TPB staff perform a series of tests to forecast how much air pollution will be generated between now and 2045, and how much the air will be improved by cleaner gasoline standards and other factors.

If the TPB's analysis demonstrates that the plan meets regional air quality goals, federal agencies certify that the plan is "in conformity." In other words, the TPB ensures that the constrained element "conforms" to air quality

25 National Capital Region Transportation Planning Board, "Washington-Baltimore Regional Air Passenger Survey, 2019: General Findings," April 2020

improvement goals. Results of the most recent analysis show that, with respect to ozone season pollutants, specifically, Volatile Organic Compounds (VOC) and, Nitrogen Oxides (NOx), the TPB is in attainment for all criteria but ozone, and the TPB is making plans to be in attainment for that criteria. While not federally required, the TPB also forecasts GHG emissions and takes strides to contribute to achieving the COG 2030 climate mitigation goals (see Chapter 3).

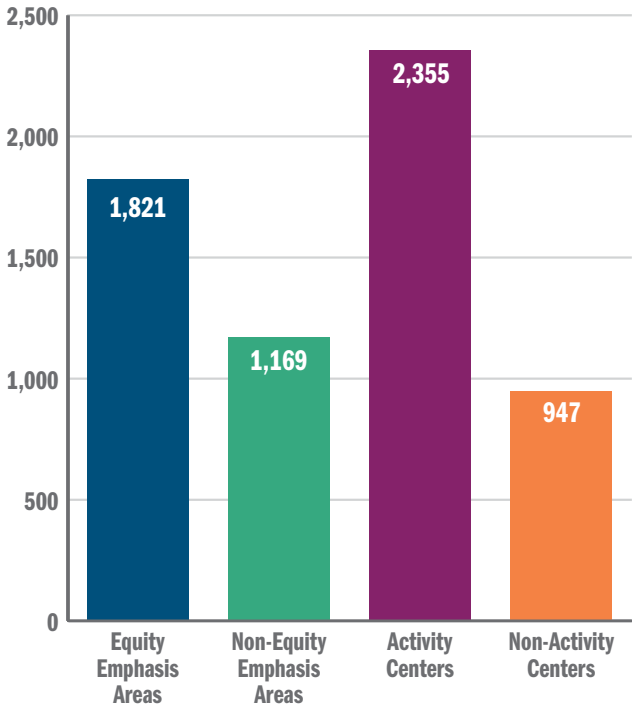
Data analysis provides important context to the experiences of residents of the region. Traffic and the number of vehicles passing near or through communities can lead to prolonged exposure to transportation-related emissions (see Figure 2.20). Increased exposure to certain forms of air pollution can lead to significant health risks. Communities' proximity to congested or high-volume roadways increases the likelihood of localized impacts, especially if elements aimed at mitigating the impacts are not present. Further, national studies and reporting have concluded that communities of color are more likely to bear a greater burden of emissions related exposure.[26]

Like other large metropolitan regions, proximity to congested roadways and high levels of vehicle volume in the National Capital Region are not felt equally. Communities closer to the region's core, interstates, or major highways experience greater exposure than in outer suburban or rural parts. In Activity Centers, proximity and level of traffic is 150 percent higher than in non-Activity Centers. This is likely reflective of high traffic counts on highways and major roads near Activity Centers. From an equity perspective, **EEAs** in the region experience 57 percent greater traffic volume than non-EEAs. The proximity of many EEAs near the region's core and along major roadways leads to the uneven experience.[27] See Chapter 6 to learn more about considering EEAs in planning.

Equitable and Resilient Communities

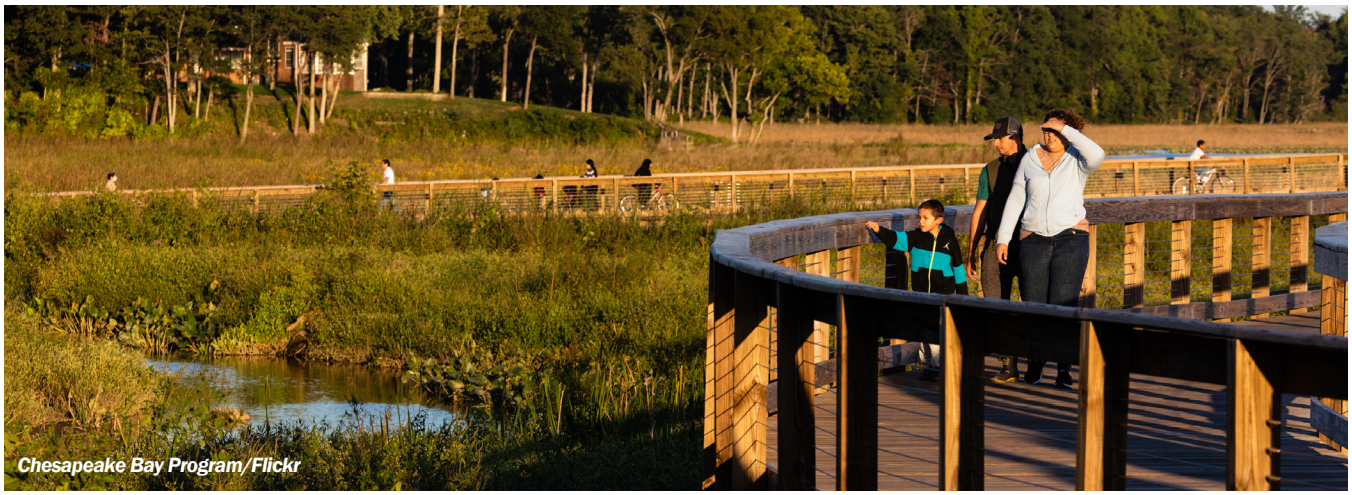
While natural disasters have occurred in the past, scientists expect the intensity, frequency, and duration of these extreme weather events to increase. Agencies will need to consider the impacts of climate change in this region and plan for a resilient and reliable transportation system. Unique needs of the region's more vulnerable populations and their sensitivities to climate impacts will need to be considered. In the COG 2030 Climate Risk Vulnerability Analysis (COG CRVA), COG demonstrated potential climate risks to vulnerable populations by overlaying their climate-risk maps with TPB's EEAs. The COG CRVA found that EEAs are more heavily burdened by extreme heat, more than 60 percent of EEAs lie in FEMA floodplains, and more than 10 percent of EEAs will be affected by a 6-foot sea level rise. The TPB and its member jurisdictions may need to work with communities in exposed EEAs to identify specific impacts and how to address community needs.

Figure 2.20: Proximity to Traffic and Volume, 2020 (Source: TPB Staff Analysis of EPA EJSCREEN)



26 Environmental Protection Agency, 2018, Disparities in Distribution of Particulate Matter Emission Sources by Race and Poverty Status, February 22, 2018

27 Count of vehicles per day (average annual daily traffic) at major roads within 500 meters (or nearest one beyond 500 m), divided by distance in meters. Calculated from U.S. Department of Transportation National Transportation Atlas Database, Highway Performance Monitoring System.



Chesapeake Bay Program/Flickr

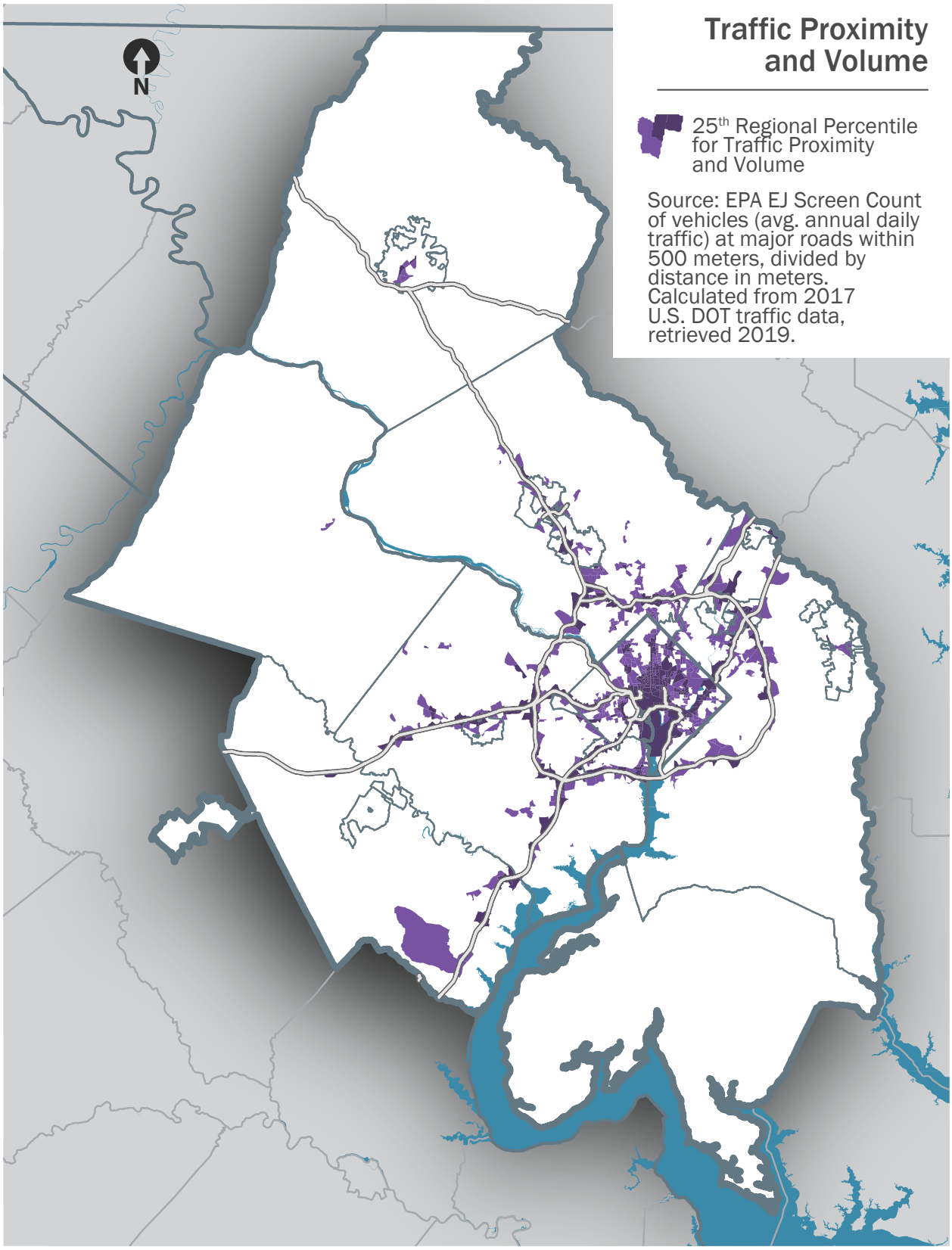
The benefits of solutions, such as clean technologies, must be shared equitably amongst all population groups. The TPB looks to achieve change that is sustainable and equitable for all residents of the region and to improve on the wrongs of the past.

Many residents are aware of environmental concerns facing the region. According to the Voices of the Region public opinion survey, 88 percent of the region's population agree that human actions contribute to at least some climate change; further, 84 percent agree that elected officials need to consider the impacts of climate change when planning transportation in the future. The survey did not ask questions about how to fund climate solutions, but residents are also aware that some environmental solutions can also bring about additional equity considerations. One noted: "If we start working on climate change, transportation is going to get a lot more expensive for a lot more people that need it."

Surveying and public input also notes equity challenges experienced by residents. Two-thirds of residents reported experiencing some form of transportation barrier to getting where they need to go from where they live, with transit-related barriers in service frequency, transfers, or accessibility as the most noted barriers. In addition, pandemic-related questioning presented challenges only experienced by those that need to commute to work. Individuals who self-identified as essential workers were more likely than non-essential workers to note inconvenience and costs considerations of transit and more likely to find the high prices of tolls as a barrier.

The TPB and its members seek to achieve change that is sustainable and equitable for all residents of the region. As the region continues to grow, evolve, and become more aware of climate-related impacts, leaders and planners will continue to meet the policy goals and aspirations that lead to a more sustainable and equitable region. As described by a participant as their ideal scenario: "...the transportation system is so human-friendly [in] design and it's accessible and it's safe, that people will actually choose to rely less on their vehicles...they feel comfortable using the [public] transportation because it's frequent, accessible, safe, and we understand that by doing the rational choice of riding [public] transportation it [not only] responds to our needs but also helps the environment."

Figure 2.21: 25th Percentile of Region Block Groups in Traffic Proximity and Volume, 2017 (Source: TPB Staff Analysis of US EPA EJ Screen Data Retrieved from US DOT Traffic Data)



Aimee Custis/Flickr

3

CHAPTER

Visualizing Our Future Together

When people visualize the future that they want and how transportation is a part of that, people tend to imagine the positive changes that they hope to see. That might be a safer walk to a corner store, an easier commute, or having more options to get around. People might imagine a healthy environment, better, more affordable options for where to live and better access to jobs. Employers and manufacturers, as well as individuals, might imagine more reliable travel times on a well-maintained system that functions efficiently. The TPB has documented the future it visualizes in its policy framework—a set of goals and priorities to work toward in our region.

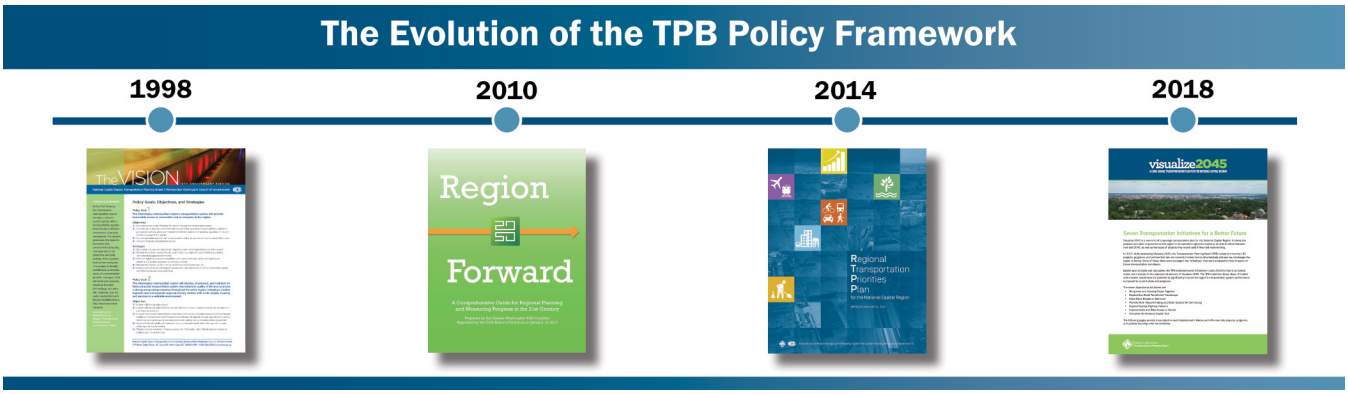
The TPB policy statements and documents that comprise the policy framework communicate the region's transportation goals, priorities, and needs that member agencies are to consider when developing and selecting projects to fund and implement. Through the projects, programs, and policies in Visualize 2045, the TPB and its members take strides to achieve the regional and local goals to make a real difference for the people and businesses that rely on the region's transportation system. In this chapter, learn more about the goals and challenges that we must address as we plan for the future of the transportation system.

THINK REGIONALLY, ACT LOCALLY

The region comes together through the TPB to establish shared regional policy goals. Local jurisdictions and agencies take action, making progress on local and regional goals by funding and implementing projects, programs and policies that move our region forward.

The TPB Policy Framework

The TPB policy framework is a culmination of a more than 20-year evolution that began with a visioning process in 1998. This framework includes comprehensive strategies that promote a strong regional economy and help improve quality of life for all residents. The policy framework consists of the TPB Vision, the Region Forward vision adopted by COG, the Regional Transportation Priorities Plan, and the seven Aspirational Initiatives endorsed by the TPB in 2018. The policy framework also includes the priorities of equity, climate resiliency, and safety as documented in TPB resolutions and in this plan.



TPB's Renewed Dedication to Equity, Safety, Climate Resiliency

In 2020, the TPB approved three resolutions renewing commitments to safety, equity, and climate change. The TPB's equity resolution affirms equity as a foundational principle that will be woven throughout TPB's analyses, operations, procurement, programs, and priorities. The safety resolution established that safety for all modes of transportation is a regional priority. This will be monitored and analyzed through performance-based planning and programming with an emphasis on aspirational safety goals associated with Vision Zero and Towards Zero Deaths.

The TPB endorsed the region's 2020 GHG reduction goals and new climate resiliency goals. These include a regional GHG emissions reduction goal of 50 percent below 2005 levels by 2030 and becoming a Climate Ready Region—making significant progress by 2030. The goals identified the need to incorporate equity principles and expand education on climate change into the TPB members' actions to reach the climate mitigation and resiliency goals. In 2022, the TPB adopted these same regional and voluntary reduction goals for the on-road transportation-sector.

These resolutions will help shape the TPB's work to ensure a more prosperous, accessible, livable, sustainable, and equitable future for all residents. **View the TPB policy framework and resolutions at visualize2045.org.**

> *"The region's residents look to elected officials to consider and take action on the impacts of climate change when planning for the future. The TPB agrees and that this matter urgently needs our attention. Climate considerations, like other goals, need to be integrated into the plan and the planning process. We all want the transportation system to work seamlessly and reliably, that also means planning for a resilient region."*
>
> *— Pamela Sebesky, TPB Chair (2022)*

The TPB Vision (1998)

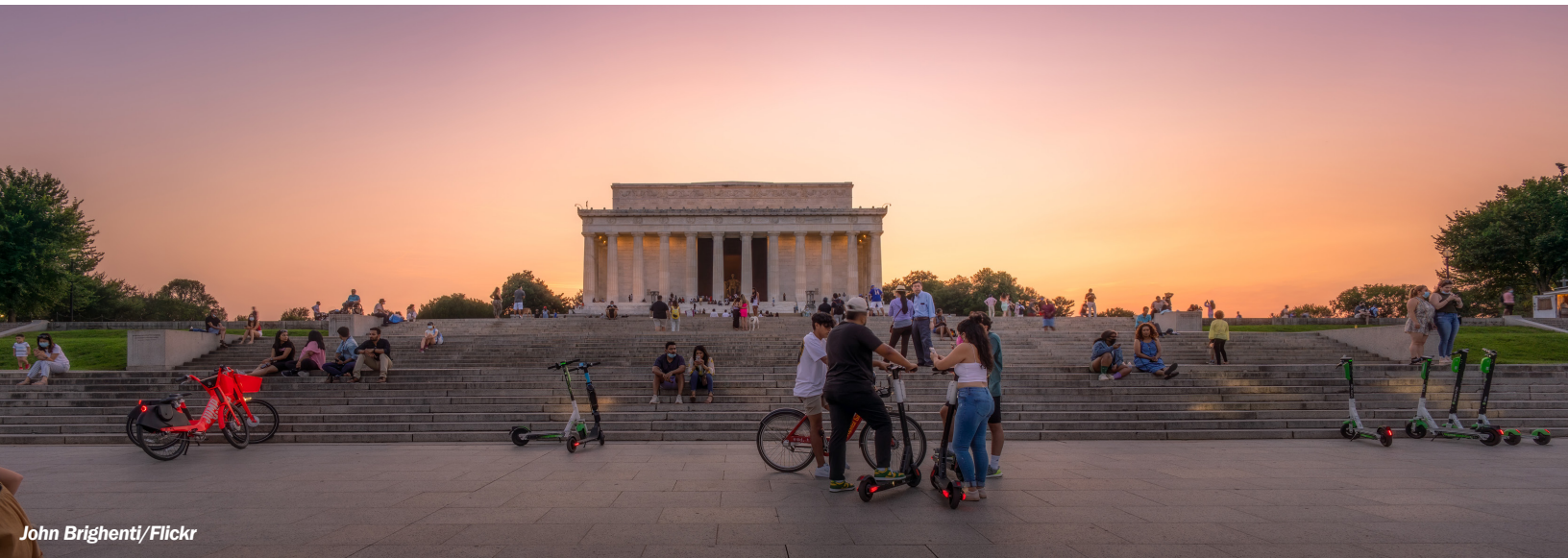
The TPB Vision, adopted in 1998, provides a comprehensive set of policy goals, objectives, and strategies that guide transportation planning and investment decisions in the metropolitan Washington region. The Vision was developed by TPB members and technical staff from throughout the region through a collaborative effort that involved consideration and inclusion of the transportation, land-use, environmental, and economic sectors.

TPB Vision Statement

"In the 21st Century, the Washington metropolitan region remains a vibrant world capital, with a transportation system that provides efficient movement of people and goods. This system promotes the region's economy and environmental quality, and operates in an attractive and safe setting—it is a system that serves everyone. The system is fiscally sustainable, promotes areas of concentrated growth, manages both demand and capacity, employs the best technology, and joins rail, roadway, bus, air, water, pedestrian and bicycle facilities into a fully interconnected network."

The Vision Goals

1. The Washington metropolitan region's transportation system will provide reasonable access at reasonable cost to everyone in the region.
2. The Washington metropolitan region will develop, implement, and maintain an interconnected transportation system that enhances quality of life and promotes a strong and growing economy throughout the entire region, including a healthy regional core and dynamic regional Activity Centers with a mix of jobs, housing and services in a walkable environment.
3. The Washington metropolitan region's transportation system will give priority to management, performance, maintenance, and safety of all modes and facilities.
4. The Washington metropolitan region will use the best available technology to maximize system effectiveness.
5. The Washington metropolitan region will plan and develop a transportation system that enhances and protects the region's natural environmental quality, cultural and historic resources, and communities.
6. The Washington metropolitan region will achieve better interjurisdictional coordination of transportation and land-use planning.
7. The Washington metropolitan region will achieve an enhanced funding mechanism(s) for regional and local transportation system priorities that cannot be implemented with current and forecasted federal, state, and local funding.
8. The Washington metropolitan region will support options for international and inter-regional travel and commerce.



John Brighenti/Flickr

Region Forward (2010)

A Comprehensive Guide for Regional Planning and Measuring Progress in the 21st Century

COG developed Region Forward in 2010 to help guide local and regional decision-making and make the region more Prosperous, Accessible, Livable, and Sustainable. It identifies shared goal areas, one of which is transportation, and numerous objectives and targets for assessing progress toward achieving each of the goals.

- We seek a broad range of public and private transportation choices for our region which maximizes accessibility and affordability to everyone and minimizes reliance upon single occupancy use of the automobile.
- We seek a transportation system that maximizes community connectivity and walkability and minimizes ecological harm to the region and world beyond.
- We seek transit-oriented and mixed-use communities emerging in regional Activity Centers that will capture new employment and household growth.
- We seek a significant decrease in greenhouse gas emissions, with substantial reductions from the built environment and transportation sector.
- We seek a diversified, stable, and competitive economy, with a wide range of employment opportunities and a focus on sustainable economic development.
- We seek to minimize economic disparities and enhance the prosperity of each jurisdiction and the region as a whole through balanced growth and access to high-quality jobs for everyone.

Voices of the Region
ON CHALLENGES

"I think the transportation thing, you have to have more of a region-wide approach, and it has to be not just in transportation departments that can impact this change...So if you can provide more housing, shorten the distance between Point A and Point B, you can decrease the amount of transportation needed. And, the most efficient and best transportation in the environment is just walking. So if you can provide people with places for people to walk, it's like a cascading effect, where you can decrease the needs all across the board."

— Resident of the District of Columbia

> *"Our transportation policy and planning decisions can have significant impacts in our region. With the right focus, we can positively affect the allocation of public resources, economic opportunities, and people's quality of life. As regional leaders, we need to reconsider how we evaluate transportation performance. Rather than travel speed and cost alone, we should be valuing inclusiveness, accessibility, livability, and economic opportunity,"*
>
> *— Reuben B. Collins, II, Esq., TPB Vice Chair (2022)*

The Regional Transportation Priorities Plan (RTPP) (2014)

The TPB adopted the RTPP in January 2014. It focuses on a handful of transportation priorities and feasible strategies with the greatest potential to advance regional goals rooted in the TPB Vision. The goals in the RTPP are frequently referenced in TPB planning activities, including the work of the Long-Range Plan Task Force which shaped what are now the TPB's Aspirational Initiatives. The RTPP goals are also used for the submission forms for projects in the financially constrained element of the plan. Pursuing the priorities outlined in this plan will lead to greater economic vitality and a higher quality of life for those that live in the metropolitan Washington region.

Priorities Identified in the RTPP:

1. **Meet Our Existing Obligations:** Funding for maintenance and state-of-good-repair needs should continue to be prioritized over system expansion.
2. **Strengthen Public Confidence and Ensure Fairness:** Efforts to increase accountability and address the needs of historically transportation-disadvantaged populations should be considered in all stages of project planning, design, and implementation.
3. **Move More People and Goods More Efficiently:** Improvements to the transportation system should seek to do more with less—to make more efficient use of existing infrastructure and promote greater use of more efficient travel modes for both people and goods.

> *"Safety is a top regional priority. As communities install high-visibility crosswalk markings, improve intersection infrastructure, and support changes that result in safer speeds, we make it possible for more people to walk, cycle, or take the bus to get to school, transit, jobs, and neighborhood destinations safely. The TPB is deeply committed to supporting safe, equitable transportation options across the region.."*
>
> *— Christina Henderson, TPB Vice Chair (2022)*

RTPP Goals:

1. **Provide a comprehensive range of transportation options.**

2. **Promote a strong regional economy, including a healthy regional core and dynamic Activity Centers.**

3. **Ensure adequate system maintenance, preservation, and safety.**

4. **Maximize operational effectiveness and safety of the transportation system.**

5. **Enhance environmental quality, and protect natural and cultural resources.**

6. **Support inter-regional and international travel and commerce.**

The TPB's Aspirational Initiatives

In 2018 the TPB endorsed seven initiatives that have potential to improve the performance of the region's transportation system compared to previously adopted long-range transportation plans. The projects, policies, and programs that make up these initiatives were identified based on their ability to make more progress toward achieving the goals laid out in previously adopted TPB and COG governing policy documents. Learn more about these initiatives in Chapter 6, Strategies for a Brighter Future.

National Goals

Through the Performance Based Planning and Programming (PBPP) legislation of Moving Ahead for Progress in the 21st Century Act (MAP-21), the federal government established national goals for transportation that MPOs must consider in their planning process. (Learn more about PBPP in Chapter 8, Planning for Performance). The matrix below shows how the national and TPB's RTPP goals align—they significantly overlap, as do the TPB's Vision goals. The TPB's Visualize 2045 plan responds to both national and regional goals, as well as the local goals of TPB's jurisdictions, through the projects, programs, and policies planned and delivered in the region.

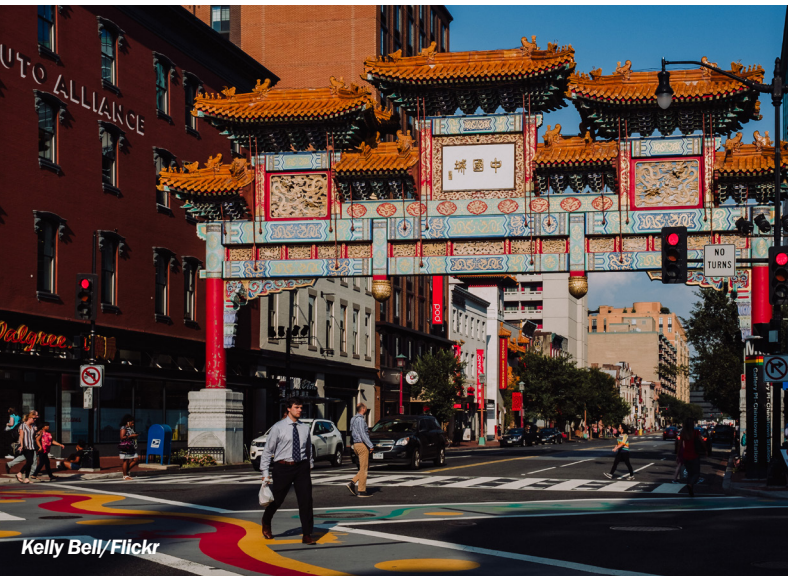
Table 3.1: National and RTPP Goals Alignment

RTPP Goals	National Goals
 Promote a strong regional economy, including a healthy regional core and dynamic Activity Centers.	• *Freight Movement and Economic Vitality*: To improve the national freight network, strengthen the ability of rural communities to access national and international trade markets, and support regional economic development.
 Support inter-regional and international travel and commerce.	
 Ensure adequate system maintenance, preservation, and safety.	• *Infrastructure Condition*: To maintain the highway infrastructure asset system in a state of good repair. • *Safety*: To achieve a significant reduction in traffic fatalities and serious injuries on all public roads.
Maximize operational effectiveness and safety of the transportation system.	• *System Reliability*: To improve the efficiency of the surface transportation system. • *Congestion Reduction*: To achieve a significant reduction in congestion on the National Highway System.
 Provide a comprehensive range of transportation options.	• *Environmental Sustainability*: To enhance the performance of the transportation system while protecting and enhancing the natural environment.
 Enhance environmental quality, and protect natural and cultural resources.	
TPB's overarching vision framework focuses on making the most effective use of every dollar, maintaining the system and delivering high quality projects to enhance the system efficiently and through a fair practices.	*Reduced Project Delivery Delays*: To reduce project costs, promote jobs and the economy, and expedite the movement of people and goods by accelerating project completion through eliminating delays in the project development and delivery process, including reducing regulatory burdens and improving agencies' work practices.

How Do the TPB's Goals and the Federal Requirements Influence Projects, Programs, and Policies in the Region?

The TPB members came to an agreement about priorities for our shared future in the adoption of the TPB's vision and goals. By setting these shared goals, the TPB has looked to the region's transportation agencies to consider both regional and local goals, priorities, and needs when developing and selecting projects, programs and policies to fund and implement.

When submitting projects for inclusion in this plan update, sponsor agencies reviewed and updated existing projects, programs, and policies in the prior adopted plan's constrained element (project list). For all new and existing projects submitted for inclusion in the Visualize 2045 update, the TPB asked sponsor agencies to document how they support regional goals, including equity and climate considerations. The TPB also asked agencies how projects implement the Aspirational Initiatives and respond to federal requirements, such as the federal planning factors. To see a summary of these responses by the sponsoring agencies, please see Chapter 7, Funding the Transportation System. **For complete responses, please visit visualize2045.org/plan-update**. To learn more about where and how the TPB and the public influence projects, programs and policies, see Chapter 1, Figure 1.3.



Kelly Bell/Flickr

Anticipating and Responding to Transportation Challenges

The TPB Vision includes a set of broad transportation-planning goals that provide policy guidance to shape the region's transportation projects, programs and policies. But, achieving the goals for the future transportation system and how it serves our communities is not without significant challenges. This plan discusses those challenges and the TPB's response to address them.

The TPB has identified numerous challenges in its plans and studies. It has developed strategies to address them and has established performance measures to track progress. Challenges create barriers to achieving our shared regional goals and show us where we must focus and prioritize our efforts.

Some of the region's primary transportation challenges include, but are not limited to, concerns such as roadway congestion, including travel time and bottlenecks, transit crowding, insufficient bus service, and unsafe walking and biking. Other challenges include the need for more development where multimodal transportation options can be made available, such as in Activity Centers and near high-capacity transit stations. Ensuring safety for all users on the transportation system is another significant challenge that matters to all.

The TPB recognizes that protecting the environment, including wildlife habitat and water, is essential while developing our region and the transportation that serves it. Mitigating climate change and planning for resiliency is critical to ensure quality of life for all.

With about 81 percent of funding needed to maintain and operate the region's extensive transportation system, this leaves a small percentage of funding for enhancements. Our region's communities and transportation system are both built out to a large degree. With limited funding and space, tradeoffs must made as to what transportation enhancements our region makes, where they are made, and how the region uses the existing space between our buildings. Our challenges must be matched by our

commitment to delivering a transportation system that provides equitable outcomes.

In 2018, the TPB responded to these challenges with the endorsement of the seven Aspirational Initiatives. As more of these concepts are enacted and funded, these strategies can more effectively work together to address our region's challenges and make headway on the region's goals. While the transportation and planning agencies in the region continue to make investments that address these challenges and make progress toward our goals, many challenges remain.

This plan responds to these challenges throughout its chapters. Chapter 2 acknowledges the challenge of planning given the impacts of, and the new questions raised, by the global pandemic. Through the TPB resolutions on equity, safety, and climate resiliency, the TPB has acknowledged the challenges associated with each of these topics. The TPB conducts analysis and lead policy discussions on the evolving challenges we face, including those identified through the federal planning factors and the factors highlighted in Chapter 4.

The TPB recognizes that these challenges impact people's lives and their experience of the transportation system. In Chapter 5, learn more about the Voices of the Region public engagement that the TPB conducted for this plan update to learn more about the public's perception of challenges as well as solutions.

Chapter 6 discusses the planning activities and strategies that the TPB and regional partners are taking to anticipate and respond to the region's transportation challenges. Chapter 7 reviews the funding for the projects in the constrained element of the plan, each project designed to improve system performance. Chapter 8 reports on how the TPB documents its performance planning through the PBPP, the Congestion Management Process (CMP), air quality and system performance analysis. Chapter 9 examines the system performance and recent study findings. It considers the next steps necessary to bring our region together to plan for a brighter transportation future.

Ron Cogswell/Flickr

Voices of the Region

ON CHALLENGES

"I like that these days you have different options like carpooling, Uber, taking the Metro. Even having biking or the electric scooters. So I would say if I didn't have a car only then I'd be riding a bike or hopping on an electric scooter. Or maybe carpooling with a friend or someone on an Uber, Lyft, so I would definitely have those types of alternatives to really help reduce the carbon emissions and helping with the climate change."

— Resident of the District of Columbia

"I think it's important to look at the service levels to all communities, so everybody has an equal chance to either ride the bus or ride the Metro or whatever the transit capability is."

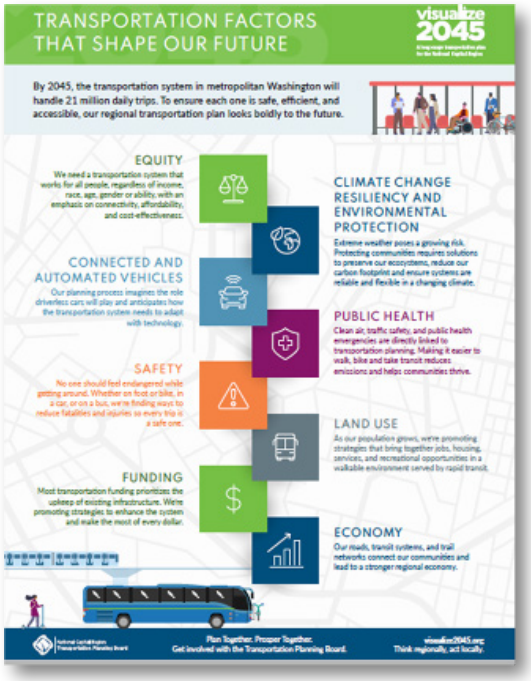
— Resident of Arlington, VA

Fairfax County

4

CHAPTER

What Factors Affect Our Future?



See TPB's infographic on the Future Factors that will impact transportation.

Today's Emerging and Significant Planning Considerations

The future is always uncertain, but the region's agencies work together to manage the transportation system effectively in an ever-changing world. While the TPB examines many planning areas, including the federal planning factors noted in Chapter 1, this chapter highlights emerging and significant factors that can impact the well-being of our communities and impact transportation demand, services, operations, maintenance, planning, and investments. The TPB calls these Future Factors. Learn more about regional planning activities for each of these factors in Chapter 6, Strategies for a Brighter Future.

The Future Factors introduced in this chapter include:

- **EQUITY**
- **CLIMATE CHANGE AND THE ENVIRONMENT**
- **TRANSPORTATION SAFETY**
- **EMERGING TECHNOLOGIES**
- **PUBLIC HEALTH**
- **ECONOMY**
- **LAND USE, POPULATION, AND EMPLOYMENT**
- **FUNDING**

As the TPB plans, it conducts scenario planning and other analyses to examine a range of possible futures and the strategies that could be most effective in them. It is not possible to know everything now, therefore, the region needs to work together to develop potential strategies and solutions that can be re-examined over time. The TPB also engages the public to gain insights as to public perspectives on the factors and how they imagine the future transportation system. The Voices of the Region survey asked: **"What transportation investments should we make today that future generations will thank us for tomorrow?"** Many responses reflected public concerns and hopes relating to the future factors, and suggested preferred strategies to address these factors. This chapter highlights select responses and then provides a summary of the responses.

Ron Cogswell/Flickr

EQUITY

In 2020, the TPB affirmed its commitment to considering equity in everything we do. To consider equity in our work, we need to plan our transportation system to address historic disadvantages due to characteristics such as race, ethnicity, age, and ability. The TPB also needs to consider and mitigate the impacts that the existing transportation system has on disadvantaged populations and ensure all people have easy access to the transportation system.

In response to the 2020 TPB Resolution on equity, the TPB will examine its work through an equity lens and will continue to share information and tools to examine and improve transportation equity in our region.

Montgomery County

Voices of the Region

> **"If bus stops and Metro stations could be more accessible to everyone, including more handicap options. Maybe textured sidewalk near transit stops, for the blind."**


MDOT/Flickr

CLIMATE CHANGE AND THE ENVIRONMENT

The TPB works alongside other sectors and with the public to halt climate change. The TPB also plans for the resiliency and reliability of the transportation system to ensure safe and dependable travel for its users. While the region has always experienced natural disasters, we need to prepare for a changing climate that is expected to increase the frequency, duration, and intensity of extreme weather events. The TPB and its members work to minimize greenhouse gases emissions from the transportation sector and meet air quality standards for the transportation system. The region's transportation agencies continue to plan and implement strategies and transportation options that limit emissions to mitigate climate change and enhance the system's resiliency.

When planning for transportation operations and investments, it is important to consider and mitigate any negative impacts on our environment, from the waters that are part of the Chesapeake Bay watershed to landcover and air. The TPB also partners with COG and its members on issues of environmental consultation and mitigation.

Voices of the Region

> **"I am extremely concerned about climate change. Please do everything you can to reduce emissions. As a farmer, I have no choice but to live in a remote area away from public transport, but I'd like you to build great systems for all who live within reach. And hopefully eventually solar powered and self-driving cars for those of us in the rural areas."**


Beyond DC/Flickr

TRANSPORTATION SAFETY

Safety remains a priority. The TPB and its members are working to reduce transportation fatalities and injuries by conducting analysis to identify high priority strategies and to implement transportation planning processes and projects that prioritize safety for people traveling in our region. Everyone should be able to get around safely. Whether on foot or bike, in a car, or on a bus, we are working together to reduce fatalities and injuries, so every trip is a safe one.

Voices of the Region

> **"Improve crosswalk safety, lighting, and sidewalks/lanes for bikers, walkers, and runners. The Metro is close enough for people to access without buses or cars, but the pedestrian safety concerns are a barrier."**

EMERGING TECHNOLOGIES

Connected and Automated Vehicles (CAVs), also known as driverless cars, utilize technological advancements to enable vehicles to take over some or all the driving responsibilities that a person has traditionally fulfilled. Driverless cars will impact the future but how and when remain uncertain. Other technologies will expand our transportation options, improve operations, and expand the availability of information at our fingertips. We need to anticipate possibilities and identify how the transportation system needs to adapt with technology.


MDOT/Flickr

Voices of the Region

> **"I think the future is electric, autonomous, and flexible...I think the region needs to lay out more guidelines and incentives for private citizens to participate in next generation transportation options; especially solar electricity generation tied to powering electric vehicles, and how to support such things in urban areas with few garages/driveways for dedicated charging stations."**


Beyond DC/Flickr

PUBLIC HEALTH

Considering public health in the transportation planning process is vital to foster healthy communities. It underscores investments in walking and biking and other active travel options. Public health considerations include access to transportation options, access to goods and services, and issues such as air quality and traffic safety. Impacts of COVID-19 have raised new transportation planning considerations. By aligning transportation planning with public health considerations, we can plan for healthier communities and better outcomes.

Voices of the Region

"I would think the investment in ensuring the bus is running on schedule, frequent cleaning especially in and after pandemic and creating a priority lane for a bus would help encourage more passengers, hence reduce the car density on the road."

ECONOMY

Our roads, transit systems, and trail networks connect our communities, support the movement of goods and services, and lead to a stronger regional economy. With a population of more than five million residents today, the metropolitan Washington region consumes and produces a wide variety of goods. These goods, such as produce, technology, home goods, vehicles, and fuel, are delivered by modes such as truck, rail, air, water, and pipeline. Often, freight travels by multiple modes on its journey from origin to the consumer. Warehouse and distribution centers supply and support the freight system. Smooth and efficient goods movement is vital to maintaining a strong regional economy. The TPB prepares for the evolution of the economy which will impact the way employers function, employees travel, and the demand for freight.


MDOT/Flickr

Voices of the Region

"Improve I-270, [there is] congestion all the time even during COVID. [We] need to address the flow so it remains smooth; need to bring subway in the area to Frederick so that is connected with DC. It will reduce traffic and bring business in the area."

Ron Cogswell/ Flickr

LAND USE, POPULATION, AND EMPLOYMENT

Population in the region will reach just over 7.0 million by 2045. Land use and development patterns put pressure on transportation infrastructure to meet the growing demands. As communities continue to grow, it is crucial that we plan to prioritize land uses that bring together jobs, housing, services, and recreation in a walkable environment served by transit. Through coordination and planning, the transportation system and development patterns can support one another more effectively and help metropolitan Washington accommodate significant growth and continue to prosper.

Voices of the Region

> **"I live about 2 miles from a Metro. It would be really nice if there was a bus that ran directly to the closest Metro. Additionally, I wish the Metro ran longer so I could take a Metro home from the bar and not an Uber."**

Beyond DC/Flickr

$ FUNDING

Most of the federal and state transportation funding is allocated to the upkeep and operations of existing infrastructure. As the region continues to grow in population and employment, the TPB anticipates more trips on all transportation modes. While the plan includes capacity expansion, the existing highway and transit systems will need to accommodate most of the increased travel demand. Even with technological improvements and changes in trip demand due to increased telework, the TPB forecasts increases in travel congestion.

To meet the growing demand and provide an efficient and resilient transportation system, we need to make the most of every dollar. The TPB's Aspirational Initiatives represent some of the most effective approaches to improve transportation performance. By implementing these initiatives together, the region can get the most out of the existing transportation system and land-use, as well as system enhancements.

Voices of the Region

> **"I would encourage more investment in public transportation, especially high-speed express trains and buses and much less privatized road...The system should provide safe, efficient and convenient transportation at reasonable costs to all citizens regardless of income level. Also, there needs to be much more investment in the electrical grid and distribution system to support electric cars and the public transportation system."**

visualize 2045

Visualizing Our Future Together:

Voices of the Region

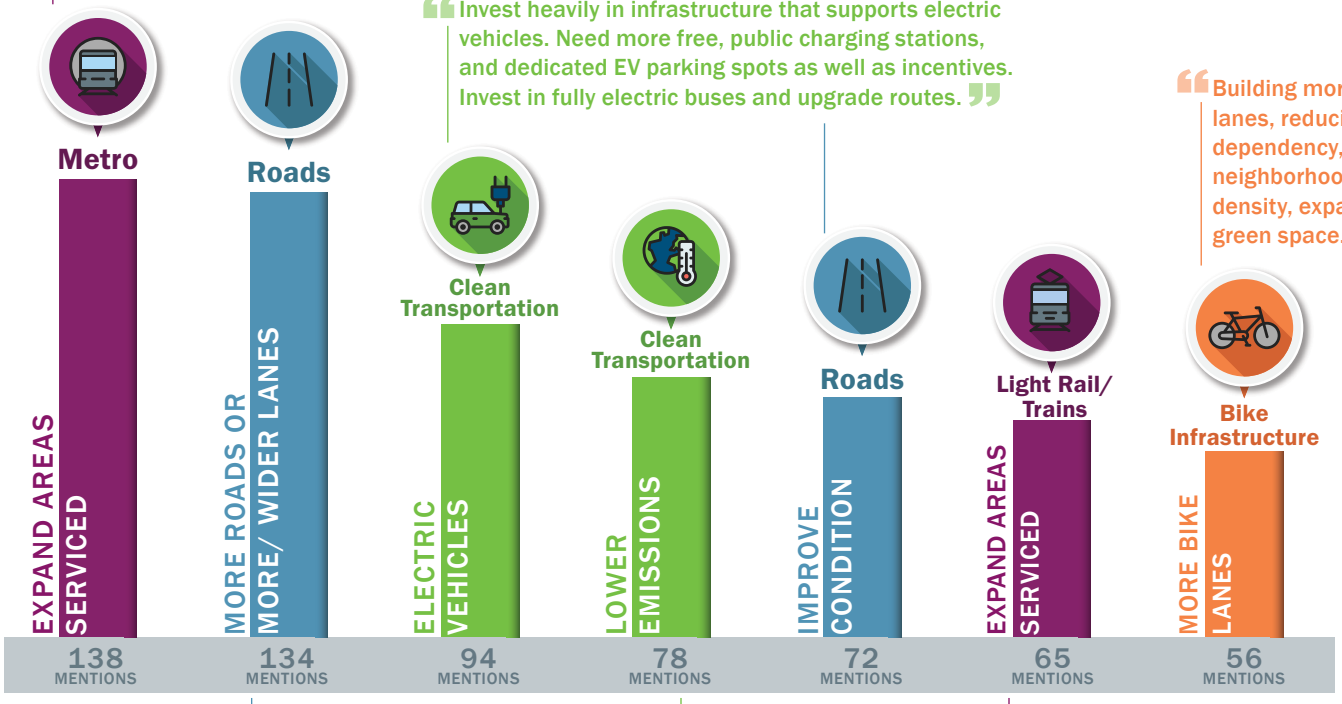
"What transportation investments should we make today that future generations will thank us for tomorrow?"

"Our Metro access in the region is quite inconvenient when major transfers can only happen at the Metro Center...if there are more sub station connections...it would provide more access."

"Improve road infrastructure including aging major bridges, deteriorating road surfaces, and stormwater effects on roads (including washouts/temporary flooding.)"

"Invest heavily in infrastructure that supports electric vehicles. Need more free, public charging stations, and dedicated EV parking spots as well as incentives. Invest in fully electric buses and upgrade routes."

"Building more bike lanes, reducing car dependency, livable neighborhoods, density, expanding green space."



"Expanding roads in congested and soon to be congested (ehem, Potomac Yard with Amazon) areas now before it gets too bad."

"Anything we can do to reduce our carbon footprint would be appreciated."

"Extend rail services beyond the current metro region in areas not yet developed for new subdivisions."

PUBLIC TRANSPORTATION

Respondents primarily looked for further investment in public transportation, including service to the core, the inner and outer suburbs, and more rural areas. They generally looked for lower fares, improved reliability, and better connectivity. They looked for more options, stops, and frequency, as well as expanded service hours. Respondents also indicated an interest in better transit access to airports.

METRO

Regarding Metro, respondents' comments focused on increased investments, improving service, reliability, safety, and maintenance. They were optimistic about completing the Silver Line expansion and adding further service to the outer areas of the region.

BUSES

Regarding buses, respondents noted lower fares and improved service and reliability, including the presence of dedicated bus lanes, frequent service, and express buses. Also mentioned, was a desire for better bus stops including more stops, and safer, better lit stops.

OTHER TRANSITWAYS

Respondents identified an interest in investment in a range of transitways that could serve the region, from the Purple Line in Maryland (under construction as of 2022), and street cars, to more frequent and expansion of service for rail, including services such as light rail, commuter rail and high-speed rail.

RIDESHARING/RIDEHAILING

Respondents noted support for ridesharing and ridehailing options, and suggested more incentives for ridesharing.

ROADS

Respondents noted an interest in improved road conditions and reduced traffic and congestion. Recommendations included more roads and wider lanes. Some proposed use of tolls and others voiced support for no lane restrictions. Others noted more lights and managed operations.

WALKING/BIKING

Respondents suggested further investments in infrastructure to create a safer and more interconnected system for people that walk or ride a bicycle. Recommendations included car-free zones, more pedestrian crossings, and wider sidewalks. They also included more bicycle trails, mixed-use trails, and bike lanes, including lanes separated from traffic.

CLEAN TRANSPORTATION

Regarding clean transportation, respondents reflected a future with lower emissions vehicles including alternative fuels and electric vehicles. They looked for more climate-friendly alternatives, emphasizing more use of clean public transportation and fewer cars.

EQUITY/ACCESS

Regarding equity, respondents looked to improvements that improve accessibility for older adults and people with physical disabilities. They also noted improved access to transportation options, and consideration of the needs of essential workers.

EMERGING TECHNOLOGY

Respondents noted improvements such as CAV technologies and infrastructure. They suggested investments to make technology easy to integrate, including access to safe self-driving vehicles and public transportation and mobility systems that offer a seamless travel experience. Some people saw the future of freight having delivery vans being replaced by delivery drones.

INFRASTRUCTURE

Respondents focused on infrastructure investments that would ensure a well-maintained and safe system that considered the need to accommodate cars across the diverse region, including in suburban and rural metropolitan Washington.

PLANNING/DESIGN

Respondents identified planning and design concepts such as reducing car use and dependence and creating more walkable communities. They noted managing development patterns, considering unique needs of rural areas, and modernizing infrastructure.

5

CHAPTER

How Do We Engage the Public?

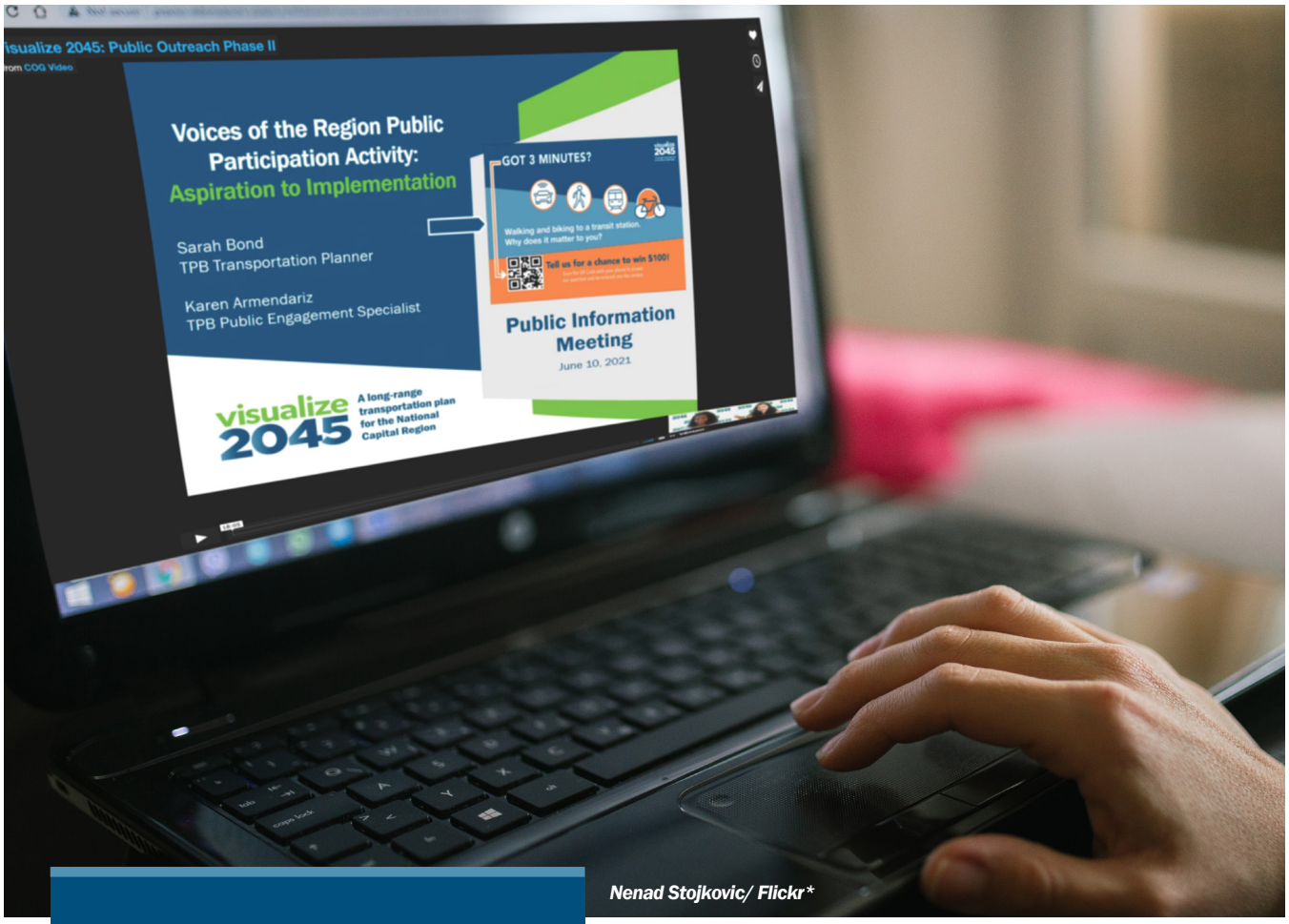
In the midst of the COVID-19 pandemic, the TPB engaged thousands of the region's residents for the Visualize 2045 update. Through the Voices of the Region outreach, which included a survey, focus groups, and poster campaign, the region's residents had a variety of opportunities to offer their concerns for today and aspirations for tomorrow. See the **Voices of the Region Story Map** to learn more. The TPB also conducted two comment periods and other opportunities to participate in the region's planning process. Full reports from the outreach activities are available on the **plan's website.**

Why Engage the Public?

Federal law and regulations require all MPOs in the U.S. (such as the TPB) to conduct public participation activities as part of the development of their LRTP consistent with the TPB's **Participation Plan**, see Appendix H for more information. But the TPB's commitment to engaging with the region's residents extends far beyond what the federal agencies require. The TPB's policy framework has long called for a collaborative planning process that considers and reflects the interests of all TPB constituencies, and seeks to make policy and technical processes that are inclusive of and accessible to all.

Public involvement improves the quality of the regional planning process and makes it much more likely that the concepts and principles of the TPB will ultimately get implemented in a way that makes people's lives better.

The TPB has numerous practices and tools in place for regular public engagement, including an online newsletter (the TPB News), social media, websites, and public comment periods. Two community-based committees regularly advise the TPB: The Community Advisory Committee (CAC) promotes public involvement in transportation planning for the region and provides independent, region-oriented resident advice to the TPB on transportation plans and issues. The Access for



*Nenad Stojkovic/ Flickr**

THE TPB'S PARTICIPATION PLAN

Updated in 2020, articulated the rationale for a robust public engagement process as follows: "The TPB believes that public input into its process is valuable and makes its products better. Regional transportation planning cannot, and should not, be based simply upon technical analysis. The information derived from public involvement is essential to good decision-making."

All Advisory Committee (AFA) advises the TPB on issues and services that are important to low-income communities, communities of color, people with limited English skills, individuals with disabilities, and older adults.

Beyond these regular TPB practices and tools, the update of Visualize 2045 offers special opportunities for intensive and focused public engagement. As the TPB's signature plan, Visualize 2045 weaves together a variety of planning activities that provide planners opportunities to ask the public about the directions the region might take.

Elvert Barnes/Flickr

Voices of the Region
PUBLIC ENGAGEMENT

The Voices of the Region survey data and input, focus group, and Aspiration to Implementation feedback are featured throughout this plan. Look for the magenta boxes with the comment bubble icon to easily identify information from the Voices of the Region.

Asking People's Opinions: 2020 Survey

What do people think about transportation at this moment? How does it impact their lives? What do they want for the future? The TPB began its first phase of the Visualize 2045 outreach in 2020 by asking such questions. This engagement gathered information on the opinions of the region's residents through quantitative and qualitative research methods.

The TPB conducted a statistically valid public opinion survey in the fall of 2020 to collect responses from randomly selected residents across the metropolitan planning area. The survey asked about changes in travel habits during the COVID-19 pandemic and explored what the region's residents want the transportation future to look like over the next 25 years. It also asked about external forces such as climate change, driverless cars, and equity concerns.

This effort obtained 2,407 completed surveys, greatly exceeding the target of 2,000. Participants received letters in the mail that invited them to participate in a web survey that they could access using a unique code included in the letter. Respondents had the option of an English or Spanish version of the survey and were also given the option to complete the survey over the telephone.

What did we learn from the Voices of the Region survey? Here are some high-level findings:

- **COVID-19 had major transportation impacts that may continue.** The survey documented the immediate impacts of the COVID-19 pandemic on transportation. Two-thirds of respondents said their daily travel habits had changed a lot during the global health crisis. Sixty percent of respondents said they had been teleworking during the pandemic, up from 16 percent who said they teleworked before. Moreover, 91 percent of those currently teleworking said they would like to continue to telework, full-time or part-time, one year after the pandemic.
- **Some communities are particularly vulnerable.** The needs of vulnerable populations were also highlighted, especially given the threats of COVID-19. Essential workers said they were far less likely to telecommute during the pandemic (32 percent of essential workers teleworked during the pandemic versus 82 percent of non-essential workers). Decision-makers need to prioritize the safety of these workers, many of which have lower incomes, as the region emerges from the pandemic.
- **Experiences vary in different parts of the region.** The survey revealed distinctions in attitudes among different parts of the region. When asked about congestion, for example, levels of frustration varied. In the outer suburbs 54 percent of respondents said that traffic congestion was a "significant concern and it impacts the quality of my life," compared to 27 percent of respondents in the region's core jurisdictions. In addition, jurisdictions with more acute concerns about congestion also tended to be the places where people were less inclined to say the transportation system meets their needs. These findings highlight the importance of policies to increase transportation options for people throughout the region, particularly for those who are dependent on driving due to the lack of transportation options where housing is more affordable. Providing transportation options and land-use coordination have long been a cornerstone of the TPB's policy framework.
- **Climate change is a reality that needs to be addressed**. One thing the region seems to agree upon is the reality of climate change. In the survey, 88 percent of respondents said they believe that human actions contribute to climate change, and nearly as many, 84 percent, think elected officials should consider climate change when making decisions about transportation. The TPB is heeding this widespread sentiment; this update to Visualize 2045 lays out strategies for reducing transportation-related emissions of greenhouse gases (GHG).
- **There is wide support for TPB policies.** For decades, regional leaders have been supporting common-sense steps to improve travel conditions for the people in the region. For example, there needs to be more transit options, efforts should be made to make it easier to walk and bike, and telework should be supported. The TPB's Aspirational Initiatives embody these concepts and the survey found widespread support. For example, 71 percent of respondents say they would like to see more dedicated bus lanes and 54 percent want bus lanes even if it removes a lane of parking. Dedicated bus lanes are a key feature of Bus Rapid Transit (BRT) systems, one of the TPB's Aspirational Initiatives. Additional findings highlighted enhancements that would prompt people to take transit more often, such as direct, safe and shaded walking routes and shaded bus stops.

*Nenad Stojkovic/ Flickr**

Listening to Real Voices: Focus Groups

Building on the survey, the TPB continued its research by talking with the region's residents to better understand opinions about transportation. In the winter of 2021, the TPB conducted 11 virtual focus groups with 112 people from around the Washington region.

As a form of qualitative research, the TPB conducted these focus groups to better understand people's beliefs, experiences, and perceptions about their daily travel. Each session was created with a specific demographic or geographic focus. The TPB staff prioritized recruiting and selected participants from historically underrepresented population groups to supplement those groups that were less responsive to the survey.

Focus Groups

DEMOGRAPHICS

The TPB staff concentrated on the following demographics for individual focus groups:

- People with low income
- Young adults (18-25 years old)
- Older adults (60+ years old)
- People of color (two sessions)
- People with long-term disabilities
- Spanish-speaking people
- People with a high school degree, GED, or no degree

GEOGRAPHY

Three other sessions, which were broken out by geography, included people from:

- Outer Suburban Jurisdictions
- Inner Suburban Jurisdictions
- Jurisdictions in the Region's Core

The focus groups helped the TPB gather qualitative and in-depth data that contextualizes and informs how different population groups understand and experience transportation through the lens of three topics that relate to TPB's goals: equity, safety, and climate change. Through the lens of these three topics, the focus group discussions provided the opportunity for the participants to discuss and explore transportation issues that correspond to other TPB goal areas such as reducing congestion, improving transportation reliability, and increasing transit frequency and access, and perceptions of safety, equity, and climate. This enabled a nuanced understanding of these policy priorities underscored by tradeoffs such as cost, time, and access to opportunities.

Equity

On the topic of equity, most conversations centered on questions of affordability. Participants emphasized the cost of riding the train and bus, particularly among transit-dependent participants. Some noted that transit systems do not seem to be planned with the concerns of people with real economic needs in mind. For example, they reflected on tradeoffs that must be made. They noted that employers of low-wage jobs often do not provide transit subsidies to lower-income riders. "You have to pick and choose," said one participant. "Do you go to work?...Do you put food on the table?...There's no subsidies for people that make below a certain income and it's truly, truly unfair." Other concerns about affordability focused on housing costs and tolls.

Equity concerns were not limited to discussions about costs. Focus group participants also spoke about temporal or geographic inequities in the availability of transportation services and how that impacts access to opportunities. People that rely on transit for their transportation described the challenge of infrequent bus services, particularly important for service workers who work night hours. In suburban areas, participants spoke about the lack of transit services and dependence on driving.

Safety

Participants in the focus groups addressed the topic of safety from a number of angles, including roadway safety and fears about crime when using transit. Participants in numerous sessions said that walking and biking often feel like life-threatening activities. “No one wants to die on their way to work or their way home,” said a participant from an inner suburban location. “So, if people had truly protected bike lanes—not just like plastic barriers, but truly, truly protected bike lanes—that would be a huge thing.” Participants from the outer suburbs spoke about feeling unsafe when they drive, particularly when encountering aggressive drivers or when driving on poorly lit roads. Others expressed concerns about personal safety while using transit. Suggestions for improvements that transportation agencies could make included better lighting and more security cameras.

Climate Change

The third topic of the focus groups, climate change, was harder for participants to discuss within the context of their personal experiences. Many expressed an understanding that their individual travel choices have an impact on greenhouse gas emissions, but they also noted that environmentally friendly options are limited and often unavailable to all people or in all areas. In such conversations, participants tended to offer suggestions for improving the supply of options, including making transit more frequent and convenient, making housing close to transit more affordable, and improving electric vehicle infrastructure.

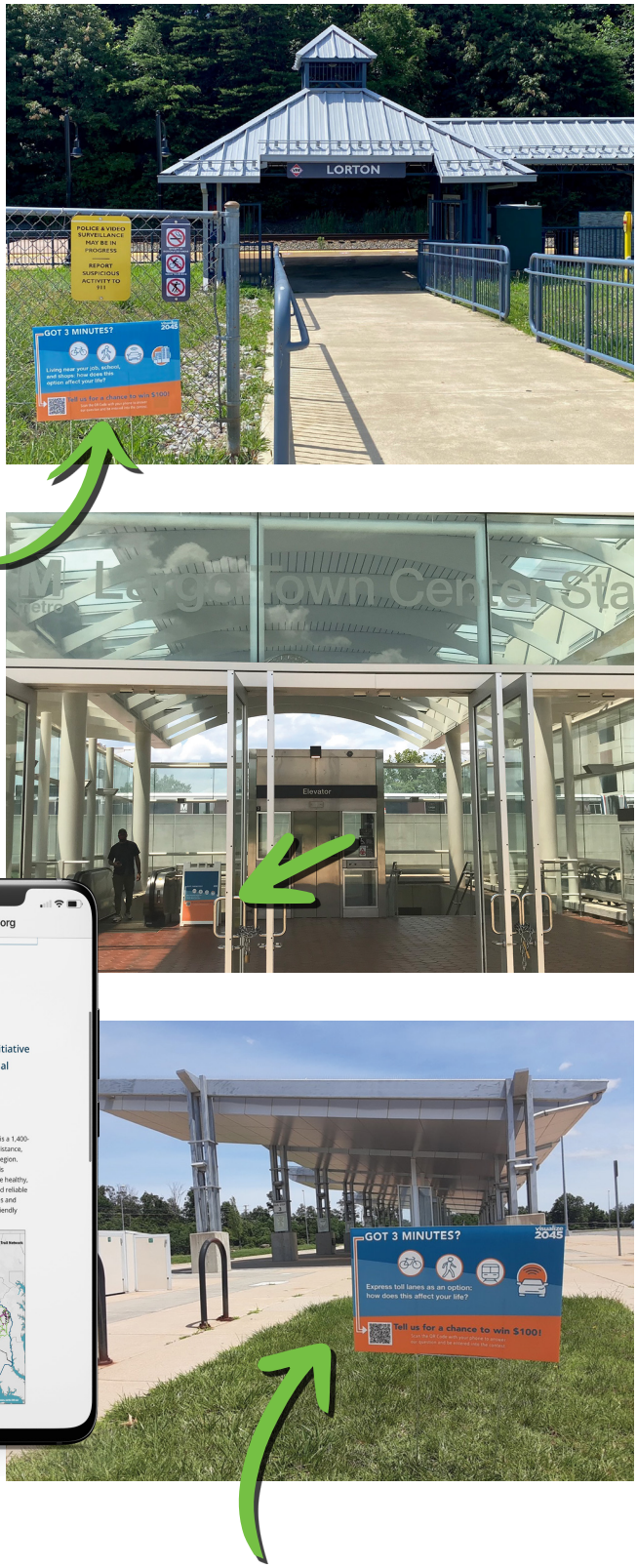
In other cases, participants were direct in saying that climate change was simply not a priority in their already challenging lives. While most participants seemed to accept the reality of climate change, they emphasized that they had more immediate concerns or felt that there was little they could personally do to make a difference for the climate. When discussing large-scale global threats, the COVID-19 pandemic was a bigger worry to many and some said the health emergency caused them to drive more, which they admitted was not good for the environment. One participant from a core jurisdiction said that when a person is in a “gas-guzzling car of whatever kind, you’re in your own little enclosed bubble and you’re safer.”

Beyond DC/Flickr

Open Opportunities for Input: Aspiration to Implementation Activity

In the summer of 2021, public engagement for Visualize 2045 moved into an open period for receiving public input. While earlier phases of outreach were invitation-only, this open phase sought input from anyone who wanted to contribute comments.

As the pandemic was not over, face-to-face engagement techniques were not appropriate for public engagement. Therefore, the TPB staff designed brightly colored posters with questions and QR codes. The posters asked participants to scan the QR code that would link to a website where participants could provide their thoughts on transportation projects, programs, and policies that have recently been implemented around the region. The TPB installed posters and signs in over 40 locations in all of the region's jurisdictions. The locations were strategically chosen to highlight new projects, such as a new BRT line or a trail, that illustrated one of the TPB's seven Aspirational Initiatives. Once on the website, participants were able to watch an informational video about the TPB's Aspirational Initiatives and respond to questions that asked how a specific transportation option has impacted them.



By highlighting physical examples of actual projects, the TPB staff sought to raise awareness of the Aspirational Initiatives. The activity was designed to "meet people where they are" and ask for feedback as they interact with projects that align with the Aspirational Initiatives. The activity also allowed the public to contribute to the TPB's discussion and analysis about these initiatives by providing input about how they impact people's lives in the region and what might be improved or continued to ensure future success. The personal experiences documented through this outreach help to make the case that the regional policies embodied in the TPB's Aspirational Initiatives are already making a difference in people's lives—and could potentially be even more impactful if implementation were accelerated.

Out of 428 total written comments about how these projects types impact people's lives, the themes most frequently mentioned included time management, efficiency, convenience, travel options, access to jobs and school, family and quality of life, health and personal well-being, safety, connectivity and the environment. Sample responses are included in the Aspirational Initiatives overview in Chapter 6.

Formal Comment Periods

In addition to engaging the public in broad outreach related to transportation policies, the TPB solicits public comment during the official public comment and interagency review periods for this plan. The two comment periods include the opportunity to review the technical inputs for the Air Quality Conformity analysis and the results of the analysis, along with the draft update to Visualize 2045 and draft FY 2023-2026 TIP. The comment summaries and comment listing can be found in Appendix I, (to be finalized in June 2022.)

Ongoing Communication

The TPB's outreach and communications work is not limited to the described activities. The **Visualize 2045 website** provides a one-stop shop for all plan documentation and features inviting visualizations, infographics, and videos to explain the plan's many complex components. The TPB News features quick summaries of regional planning activities. In addition, the TPB live-streams meetings on the web and posts recordings for anyone to access. When the TPB conducts meetings in person, any resident is welcome to attend and to publicly address the board at the beginning of every meeting.

Two-way information sharing and engagement is a hallmark of the regional planning process. These practices will continue to be vital as the TPB, its stakeholders, and residents from across the region work together to shape a brighter future for transportation in the National Capital Region.

Photo by E. Tang


VDOT/Flickr

6

CHAPTER

Strategies for a Brighter Future

Regional Planning Activities and Strategies

This chapter describes the planning activities and strategies that the TPB and its partners use to work toward a brighter future where the transportation system serves the needs of all its users. The transportation system connects the region's communities. All parts of the system must work together to provide a wide range of travel options in the National Capital Region that are safe, efficient, and effective for all travelers. Regional planning and strategies inform how we can grow and invest in the transportation system.

The metropolitan Washington region is expected to experience population and jobs growth in the coming decades. To help the region prepare, the TPB leads regional planning and policy efforts that consider the tradeoffs of various strategies and sets the vision for how our communities grow. These efforts inform strategies that help reduce congestion on the roads, improve transit access and reliability, and make it easier for all people to walk and bike, leave their cars at home, or not own a car at all. They make it easier for freight to move through the region to serve the economy, deliver packages to residents and help connect disadvantaged communities to employment, educational, and recreational opportunities. Continue reading to learn more about

WHAT IS A STRATEGY?

A strategy is a way to achieve a goal.

the TPB's planning and regional coordination activities to promote safe, sustainable, and reliable movement for people and goods. Strategies are organized in the following sections:

- **TPB's Aspirational Initiatives** — learn about seven endorsed initiatives that when implemented together will not only improve mobility, accessibility, and air quality in the region but also contribute to the region's GHG reduction and climate resiliency goals.
- **Transportation Options** — learn about the TPB transportation demand management strategies, and planning activities for bicycling, walking, scooting. Find out more about transit planning for local, regional and intercity service, commuter and passenger rail, and learn about planning activities for people that travel in vehicles and by air.
- **Strategies to Address Future and Planning Factors** — learn about a wide range of planning activities to address the factors that must be considered as we plan for the transportation system: safety, equity, land-use, climate mitigation and resiliency, and more.

How Does the TPB Identify Strategies?

As the TPB develops potential strategies, it first considers the current planning context, including the existing transportation system, land use, and social, economic, and environmental conditions. The region has made a substantial investment in thousands of miles of roads, transitways and stations, and bicycle and pedestrian facilities. A primary strategy—protecting this investment through regular maintenance—requires that the region dedicate about 28 percent of the transportation funds to maintaining the state of good repair.

The TPB also considers challenges and opportunities and ensures that strategies to enhance the system are feasible, practical, and implemented in the most effective manner. Strategies are informed by and documented through the numerous TPB planning activities, such as the **Long-Range Plan Task Force** (2016-2017) that led to the TPB endorsement of the seven Aspirational Initiatives, and the 2021 transit service and fare equity study.

EQUITY IN PLANNING

The TPB considers equity in all its work. Each planning area discussed in this chapter highlights equity considerations and discusses ways that TPB considers equity in its planning practices.

By bringing the region together for regional conversations and setting priorities, the TPB developed and continues to assess strategies to reduce transportation emissions and plan for the resilience of the transportation infrastructure in the face of climate change, including the strategies in this chapter from the TPB's most recent study, the Climate Change Mitigation Study of 2021.

The TPB also documents numerous strategies through the federally required Performance-based Planning and Programming approach (PBPP) and Congestion Management Process (CMP), which are explained more in Chapter 8. The TPB and member agencies seek ongoing input from the public and regional partners on challenges and approaches to ensure strategies meet the needs of the people and businesses that rely upon the transportation system.

The TPB coordinates many different types of transportation planning and programs that bring together regional leaders to tackle real-world challenges and take action to make progress toward the vision for the future. Through a consensus-building process informed by the TPB's Technical Committee and sub- and advisory committees, public engagement activities, and objective analysis, the TPB establishes strategies to address the transportation challenges faced today and in years

to come. This chapter provides information about the roles of the TPB committees and strategies to provide a comprehensive range of travel options that address congestion, improve access and mobility for all, mitigate climate change, and protect our natural environment.

How Does the Region Implement Strategies?

Based on each TPB member's unique context, TPB's member agencies implement strategies through transportation and land-use projects, programs, and policies that are informed by the coordination, outreach, surveys, studies, and analysis that TPB conducts through its role as the region's MPO. Some strategies may be implemented by actions of the public, private sector, or non-profits. Learn more about the planning process and implementation in Chapter 1, About the Plan.

UNDERSTANDING THE PLAN

For each project submitted to the plan, the project sponsors indicate how the project helps to advance TPB's goals. They document if each project enhances, promotes, or supports each transportation option, planning area, and federal planning factor. The TPB summarizes these responses in the "Visualize the Future" sections for each topic in this chapter and in Chapter 7.

Each project may enhance, promote, or support more than one transportation option or planning priority. To see a summary of projects and how they help implement the TPB's vision, goals, Aspirational Initiatives, and respond to the planning factors, please see Chapter 7, Funding the Transportation System. **For complete responses by jurisdictions, please visit the Visualize 2045 website.**

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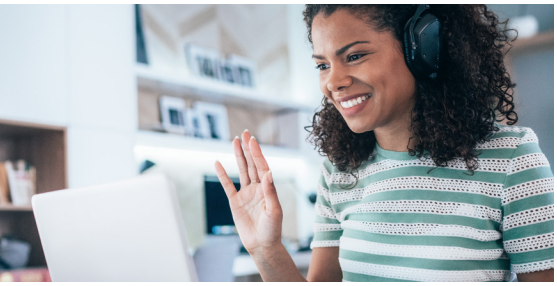
Elvert Barnes/Flickr



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TPB's Aspirational Initiatives

In 2018, the TPB adopted seven transportation initiatives. Each initiative incorporates policies and transportation solutions that the TPB has championed for years as documented in the CMP. These strategies are most effective when working together by providing more options on a well-integrated and reliable transportation network. As the TPB members prioritize funding and enact these strategies, the region has the potential to significantly improve its transportation system performance. With the update to Visualize 2045, the region will make progress on these initiatives that improve mobility, accessibility, and air quality in the region while contributing to the region's GHG reduction and climate resiliency goals.

Arriving at and promoting implementation of the initiatives:

The TPB led a study that engaged a long-range plan task force to establish consensus on regional policy priorities, which led to the 2018 endorsement of the Aspirational Initiatives, listed below:

- **Bring Jobs and Housing Closer Together** by concentrating more housing and jobs in central locations such as Activity Centers and near high-capacity transit station areas to make it possible for more people of all incomes to live near employment and other frequent destinations. This can enable trips to be shorter and reduce auto trips as people will be able to choose from a range of travel options.
- **Expand Bus Rapid Transit and Transitways** throughout the region to provide people not only more transit options but also a reliable and fast bus service for work and non-work trips.
- **Move More People on Metrorail**, by providing more frequent services with longer trains and expanded stations that are accessible by nonmotorized modes.
- **Provide More Telecommuting and Other Options for Commuting** to take advantage of the many jobs suitable for teleworking and to provide employees with transit and nonmotorized travel benefits and disincentivize commute parking.
- **Expand Express Highway Network** strategically, in an environmentally sensitive manner, to create a network that connects much of the region, featuring express bus systems and allowing carpools and vanpools to be exempt from tolls.
- **Improve Walk and Bike Access to Transit**, as investments that remove barriers to walking and biking to transit stations to reduce auto travel and help fully utilize the investments already made in high-capacity transit.
- **Complete the National Capital Trail Network** to create an extensive network of trails that provides walk and bicycle access to jobs and other activities by connecting communities across the region to Activity Centers.

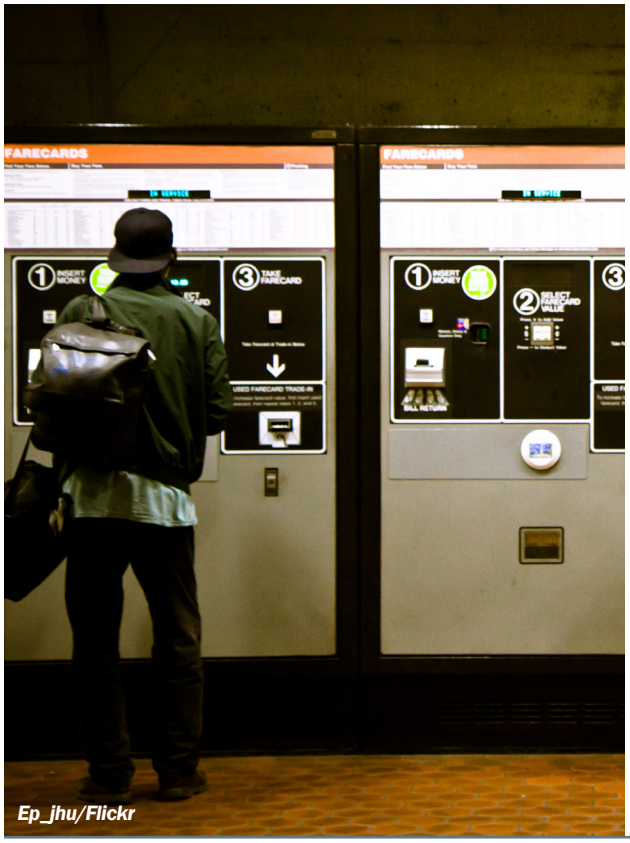
Following the endorsement of the initiatives, the TPB's staff visited the TPB's technical agencies to discuss the initiatives, learn what the agencies were undertaking that advanced the initiatives, and to identify opportunities for the TPB to support implementation of the initiatives. The TPB promotes the Aspirational Initiatives by providing communications tools such as brochures, infographics and animated videos about the initiatives so that people can learn and share information about the concepts behind these initiatives and the benefits they can bring to the region. See these videos and graphics here:

Download the Infographic

Watch the Animated Video (English and Spanish versions)

The TPB also conducts analysis and develops technical tools, data, products, and programs to support the implementation of initiatives in response to the TPB Resolution R10-2019 which directed staff to conduct activities related to the implementation of three of the Aspirational Initiatives. Learn more about these activities throughout this section.

Mike Maguire/Flickr



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Equity Considerations

Where and how the Aspirational Initiatives are implemented can have an impact on equity outcomes in our region. To assist implementing agencies consider equity in the planning process, the TPB makes the Equity Emphasis Areas (EEAs) available as a planning tool to examine demographic patterns in the region. For example, EEA locations can be used to plan and prioritize areas to improve walk and bicycles access, transit movements, and routing. The TPB also conducts studies and outreach that consider equity across a range of subjects and encourages the findings to be considered when planning for investments that promote the initiatives. The following pages describe the initiatives and offer data and perspectives from the TPB's focus groups and Aspiration to Implementation activity to provide insights on how the initiatives relate to equity concerns. The benefits of the initiatives, when implemented together regionwide, can address some of the top equity concerns raised during the focus groups, such as safe walk and bike access to transit, housing affordability near a range of transportation options, transportation access, travel time, and reliability.

ASPIRATIONAL INITIATIVES FOR A BETTER TRANSPORTATION SYSTEM

visualize 2045
A long-range transportation plan for the National Capital Region

THE CHALLENGE

By 2045, metropolitan Washington will be home to 1.3 million more people and 1 million more jobs.

Available funding for transportation and the types of planned improvements can't do enough to prevent significant increases in congestion and travel delays.

Transportation Dollars

81% Maintenance and Operations

19% Improvement Projects

THE SOLUTION

TPB's Visualize 2045 plan prioritizes initiatives that make the most of every dollar, offering everyone in the region more options for where to live and how to get around. Here's how:

Concentrate land use in Activity Centers where housing, jobs, and transit are close to each other

Circulate people in Activity Centers via safe, accessible travel options for work and play

Connect Activity Centers via high-capacity regional transit and express highways

Aspirational Initiatives

- Bring jobs and housing closer together
- Increase telecommuting and other options for commuting
- Improve walk and bike access to transit
- Expand bus rapid transit and transitways
- Complete the National Capital Trail Network
- Move more people on Metrorail
- Expand the express highway network

THE IMPACT

Improved quality of life

- Vibrant, mixed-use communities
- More and affordable housing options
- More time with family and friends

More ways to get around

- Equitable, accessible, safe choices
- Shorter trips
- Options to walk, bike, drive, and take transit to work and play

Improved economic competitiveness

- More reliable and reduced travel times
- More efficient movement of goods
- Greater access to employment opportunities

Source: TPB

Der Berzerker/Flickr

Beyond DC/Flickr

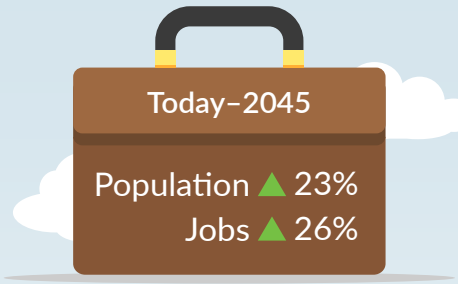
BRING JOBS AND HOUSING CLOSER TOGETHER

visualize 2045
A long-range transportation plan for the National Capital Region

THE CHALLENGE

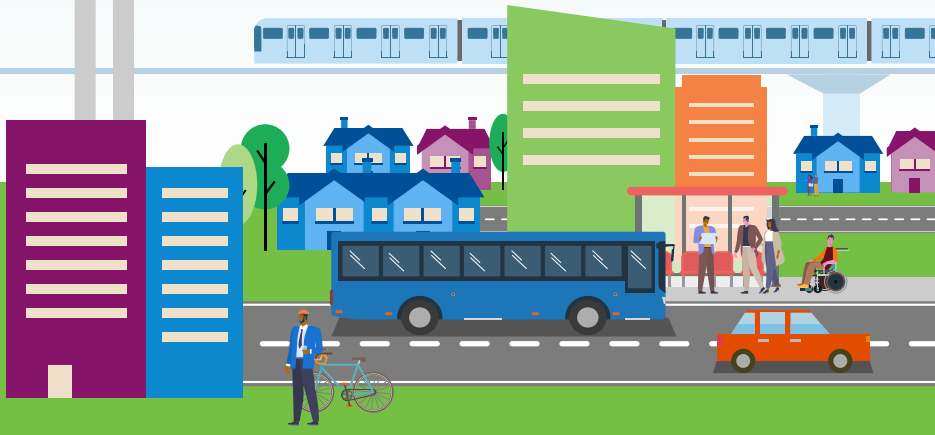
People travel from their homes to find jobs and opportunities. But jobs and housing are often not near each other, leading to longer commutes. A lack of travel options and affordable housing near jobs leads to congestion and delays.

As the region grows, how can we improve travel for all?



Since 2010, the region has focused on building **new homes in Activity Centers**, where housing, jobs, and transit are all close to each other.

But, Activity Centers are home to just **29% of the population**, despite containing **66% of the jobs**.



THE SOLUTION

Here's how we can reduce congestion for everyone, while expanding housing options for people who want to live closer to where jobs are.

- **Create and support policies** that encourage building more housing
  - 320,000 new units needed by 2030
  - 75% to be affordable and near Activity Centers and transit
- **Improve travel options** in and between Activity Centers

This approach works! More choices mean less congestion.

How we get around is changing

Drive Alone	▼ 13%
Take Transit	▲ 7%
Use Active Travel	▲ Doubled
Telework	▲ Tripled

(Change in each travel type's share of daily commutes, 2001–2019)

THE IMPACT

Source: TPB

Reduced traffic and emissions from transportation

Expanded travel options and shorter trips

Vibrant communities where people can live, work, and play

A stronger economy and improved quality of life

Bring Jobs and Housing Closer Together

What is it?

- **More housing and jobs in central locations.** There will be new opportunities for people to live or work near high-capacity transit (HCT) stations and in Activity Centers—places where jobs and housing are concentrated and it's easy to walk, bike, or take public transit.
- **Taking advantage of underused Metrorail stations** and focusing growth in HCT station areas. Local planning efforts would encourage housing and job growth close to Metrorail stations that aren't as busy as others and have available space nearby for new construction.
- **Coordinated local policies.** This initiative asks regional leaders to coordinate local policies through zoning and revisions in local plans, allowing more people to live closer to jobs.

Visualize the Future:

- **Fewer, shorter trips in cars.** More housing close to Metrorail stations and in Activity Centers would let more people walk to work and transit. That means fewer cars on our region's roads. And that would significantly reduce congestion, making driving more reliable for those who commute by car.
- **Reduced traffic from commuting from outside the region.** Our region doesn't have enough housing for our expected growth. By building more housing, we can encourage more people to live in our region instead of commuting in and out every day.
- **Increased economic opportunity.** More jobs would be available to more people within a short distance from home—which is particularly important for the car-free and workers with low income.
- **Vibrant communities.** Imagine being able to walk and bike to work, school, errands, and fun. It's good for our health and for the environment. More household growth concentrated in central locations would help us achieve that future.
- **New housing** in Brookland in the District of Columbia demonstrates the concepts of this initiative. In Maryland, new housing planned for and under construction near the Purple Line stops exemplifies this concept. In Virginia, developments planned around the new Silver Line and the North Woodbridge Small Area Plan represent the concepts of this initiative.

TPB's Role

The TPB calls upon regional leaders to promote policies that "Bring Jobs and Housing Closer Together," especially focusing growth in Activity Centers. And, TPB Resolution R4-2022, focuses on building transit-oriented communities (TOC) throughout the region around HCT station areas using Equity Emphasis Areas as a key planning concept and tool to inform decision-making and action. Learn more in the Land Use section of this chapter and visit **TPB's interactive HCT/EEA website** to explore information for planners, policymakers, and other area leaders as they design TOCs and weave equity into planning decisions.

Voices of the Region

Elvert Barnes/Flickr

Focus Groups

Findings from the Focus Groups indicate that a diverse range of people find value in being able to live near work and having safe, reliable, and affordable transportation to employment. Issues of equity were raised on topics such as travel time, cost, and reliability of transportation that makes access to work difficult. Focus Group participants described tradeoffs that they have needed to make, such as taking a lower-paying job because of transportation barriers. By adding more housing that is affordable to people with lower incomes and the general workforce near high-capacity transit in Activity Centers, the TPB's member agencies can address some of these barriers and reduce the tradeoffs that people must make in their daily lives.

Aspiration to Implementation

TPB asked: "How does having options to live near your job, school, and shops affect your life?"

"Having options to live near my job and school is very impactful on my life. It means that I not only have multiple options on where I can potentially work, but the initiative ensures I can make it to school on time and safely. I go to school at George Mason University, and since there is so much reliable transportation namely the Metro and (Fairfax) Cue buses in the area, it makes it easy for me to make it to class and when I study with friends or need to meet a professor."

"It makes all the difference in the world, I'm lucky enough to live within walking distance of a Metro station and it opens up a whole new world for me. Not having to rely on a car for transportation to both my job and also a fun weekend in DC is such a blessing—avoiding traffic and toll fees is always a joy!"

"I currently live in DC and I love having restaurants, and all kinds of places near me. I work in Reston, so it's very convenient too, that both my home and workplace are close to Metro stations. If my workplace was not close to public transportation, I would definitely consider switching jobs. I cannot wait for the Reston Town Center station to open!"

Expand Bus Rapid Transit and Transitways Regionwide

What is it?

- **A dramatically expanded transit service.** Bus rapid transit, or BRT, is an enhanced, high-frequency service that makes use of transitways and brings together other enhancements that can move more people faster and more reliably than traditional bus services. Express bus, streetcar, and light rail systems would be available for more people in more places throughout the region.
- **Targeted rail projects.** Streetcar and light rail routes would provide targeted connections within the regionwide system, serving high-density locations and promoting economic development.

Visualize the Future

- **Bus agencies in metropolitan Washington provide over 164 million trips annually**, and most people live within 1/4 mile of a bus route. But increased traffic means trips are getting slower and less reliable. Enhancements such as dedicated lanes and transit signals that prioritize bus travel can improve mobility.
- **A diversity of transit options.** Imagine having access to express transit, even if you live or work far from a Metrorail or regional rail station. Providing more BRT and transitways in corridors not well served by a Metrorail station can address equity concerns in our region by providing more people, including people living in EEAs with better access to fast, frequent and reliable low-cost transit. BRT buses would operate in their own separated lanes with payment systems and level boarding to get people on and off quickly. Level boarding that does not require stairs or a lift to ride the bus will create an improved experience for people with limited physical abilities.
- **More access to jobs.** Along with new transit comes access to new opportunities. BRT, light rail, and streetcars would not only connect the region's many Activity Centers—our economic engines—but would also help people move around within them. More transit would provide new travel options for scores of people who currently struggle to get to and from work.
- **Better access for people who walk and bicycle to transit.** New buses and rail encourage walking and bicycling. To maximize the benefit of new transit services, we need to make sure people can get to and from stations on sidewalks, paths, and bike lanes safely.
- **Metroway that connects Alexandria and Arlington, VA** was the first BRT system in our region, launching in 2014. In 2020, Montgomery County, MD, began service on its first Flash BRT line and has plans for several more BRT lines. DDOT is continuing to advance transitways such as the H&I Street Bus Lanes project and the 16th St NW Transit Priority project. Agencies are studying additional BRT potential for the region, expect to see more studies and plans for BRT and transitways, and more projects moving to implementation.

TPB's Role

The TPB has conducted studies that provide analytical backing for the regional benefit of BRT and transitways. The TPB Regional Public Transportation Subcommittee discusses local BRT project features and implementation approaches. The TPB also gathers public opinion through its Voices of the Region outreach and promotes the initiative through **animated videos and infographics**.

Voices of the Region

Survey

Findings indicate that 71 percent of respondents support dedicated bus lanes, and 54 percent support dedicated bus lanes with the removal of on-street parking. When asked about possible changes or improvements to the trip aboard the bus that would make them more likely to ride the bus, the most popular option was if "buses arrived on a reliable schedule," (40 percent) followed by if "buses traveled more quickly" (26 percent) and if "buses were less crowded" (23 percent). By expanding BRT and transitway regionwide, these improvements would be realized.

Focus Groups

Discussions illuminated that travel time and reliability were critical issues for the participants, many of which were people from lower-income or historically disadvantaged groups. The features of BRT, such as transit signal priority, dedicated lanes, and level boarding would provide for increased reliability and less travel time. The higher frequency of buses would mean less waiting and less impacts from "missing the bus".

Aspiration to Implementation

TPB asked: "How does having faster and more frequent bus service affect your life?"

Participants identified benefits including being able to get to important appointments and work without needing a car, getting to work on time, escaping bad weather, and getting home on time:

> "It makes my commute to work, the grocery store, nightlife, and Metro faster, more feasible and convenient."

> "I would be able to visit family more often and it would be easier."

> "Personally, improvements like until-midnight BRT service as far north as Watkins Mill Rd on MD 355 and on routes like MD 586 would give me a lot of extra flexibility for most trips and would likely weigh heavily on my decision to remain car-less long-term."

BUS RAPID TRANSIT AND TRANSITWAYS: FAST-TRACK YOUR TRIP

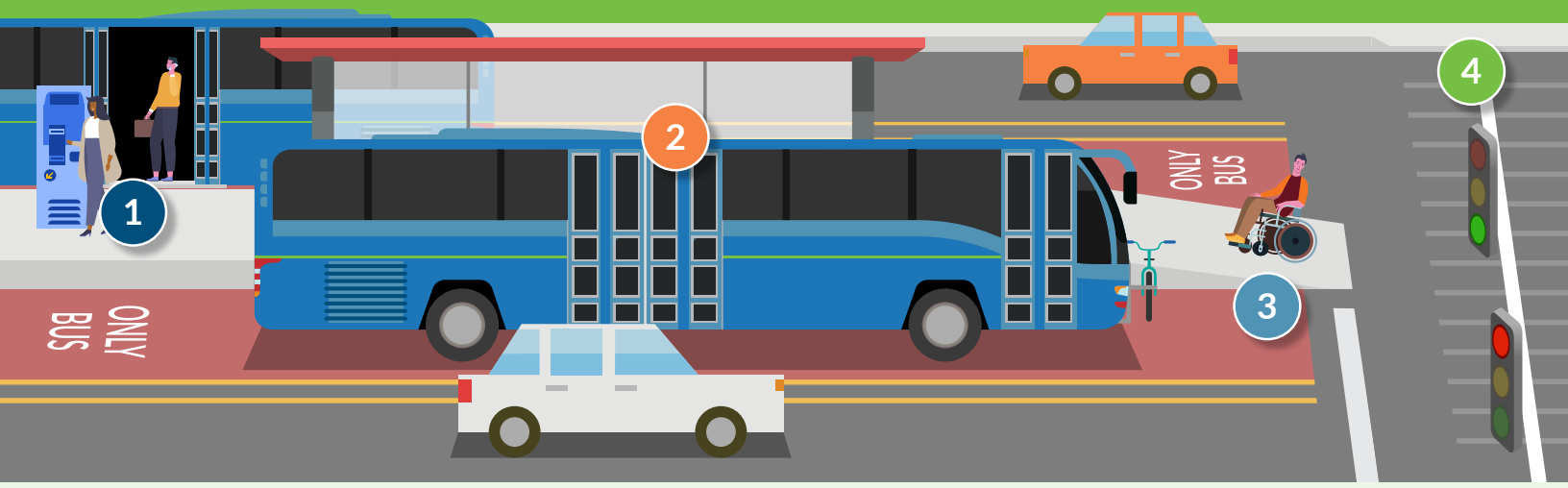
visualize 2045
A long-range transportation plan for the National Capital Region

Bus agencies in metropolitan Washington provide over **164 million trips annually**, and most people live within 1/4 mile of a bus route. But increased traffic means trips are getting slower and less reliable. Enhancements such as dedicated lanes and transit signals that prioritize bus travel can improve mobility.

Bus rapid transit, or BRT, is an enhanced, high-frequency service that makes use of transitways and brings together other enhancements that can move more people faster and more reliably than traditional bus services.

HOW IT WORKS

1. Improved stations have **offboard fare collection** and **platform-level, all-door boarding**.
2. **Frequent, reliable service** shortens wait times.
3. Transitways with **dedicated lanes** provide faster trips.
4. **Transit signal priority** and **queue jumping** let BRT buses go first at traffic lights, reducing delay.



WHY IT MATTERS

- More reliable, faster trips
- More affordable travel options
- Expanded access to jobs and opportunities
- Improved mobility options
- Fewer greenhouse gas emissions

BRT and Transitways in Your Neighborhood

Location	Description
Metroway BRT: Arlington and Alexandria, VA	5.6 miles connecting the Pentagon City and Braddock Road Metrorail stations
Flash BRT: Montgomery County, MD	14-mile stretch of U.S. Route 29
Transitway: District of Columbia	3 miles along 16th Street NW

Beyond DC/Flickr

Elvert Barnes/Flickr

Move More People on Metrorail

What is it?

- **Making strategic investments to get more people moving through the center of the region on Metrorail.** There would be more trains and lines, and stations would be expanded. The focus would be on the downtown core of the region to accommodate more riders where stations and trains are overcrowded.
- **Longer trains.** In the near-term future, eight-car trains (instead of six-car trains) would run on all lines at all times.
- **Expanded stations.** Stations at the heart of the system would be expanded to handle new riders with less crowding. These changes would include expanded mezzanines and new fare gates and escalators.
- **Other Metrorail enhancements** such as new stations and services.

Visualize the Future

- **Dependability.** With major investments to bring Metrorail to a state of good repair, imagine more trains, running more often, with stations that have space for more people. The expanded capacity would make the Metrorail system more reliable and efficient.
- **Region-wide impacts.** Enhancing capacity on the existing system would benefit the whole region. Currently, the 26 stations in the region's core are the destination or transfer point for 80 percent of all rail riders system-wide. When those links are clogged, travel everywhere is affected.
- **Alleviate congestion.** These projects would not only affect transit riders. By making it easier to get on the train, we can ease congestion on the roadways and improve travel time for trips people take daily, whether on Metrorail or by car.
- **World-class system.** The economic benefits to the people and businesses in our region by helping them conduct their daily business travel with ease. Enhanced capacity on Metrorail would improve access to jobs and strengthen our competitive advantage in the global economy.
- **More cars, more stations.** In addition to the eight-car trains that will be added to the Metrorail system, another example of a project in the constrained element that will help to move more people on Metrorail is the new Potomac Yard Station in Alexandria (CE1978).

TPB's Role

The TPB has long championed Metrorail as a critical service in the region. At key moments, the TPB has come together to push for increased regional transit funding. The TPB promotes Metrorail service improvements that will help people in our region get where they need to go reliably, conveniently, and with limited carbon footprint.

Voices of the Region

Survey

When asked about possible changes or improvements to rail transit that would make them more likely to ride, the most popular choice was for "trains [to come] more frequently" (chosen by 40 percent), followed by if "trains were less crowded" (35 percent). These two choices are closely related, and the improvements to Metrorail captured in this initiative would realize both of these preferred improvements.

Focus Groups

Discussions regarding Metrorail focused on affordability, not only of the fares but of housing that is proximate to Metrorail. This finding demonstrates how the initiatives will be most effective when implemented together, including working toward focusing housing development that is affordable near high-capacity transit, while also providing other fast reliable transit in areas not close to Metrorail.

Aspiration to Implementation

TPB asked: "How does having frequent Metrorail and eight-car trains affect your life?"

Participants noted that these impacts would mean they'd take Metro instead of other options, citing an improved quality of commute, less waiting, more flexibility, and environmental benefits:

> "Makes it much more likely that I'd use the Metro as my go-to transportation choice."

> "Having access to reliable Metrorail is necessary for my daily life and allows me to commute to work without stress. It also allows me to have an active social life on the weekends, as I have friends who live all around the DMV."

> "More frequent service would mean much less waiting for me to get to work or to go to meetings, or in DC for dining out, baseball, and other events."

> "Frequency is freedom. Life is so much easier when you aren't planning around a schedule and makes up for the everyday unexpected issues that might delay you."

> "It means I can take Metro to work instead of driving, which cuts down on greenhouse gases and the hassle of parking. It also means I can find a spot on the train at rush-hour in the morning."

> "It not only saves me from headaches from having to figure out how to get places when it's not peak hours, it also makes it easier for me and my friends to commit to more environmentally sustainable choices and lifestyles."

Provide More Telecommuting and Other Options for Commuting

What is it?

- **Reducing solo car trips.** This initiative would expand programs to increase the number of people who telework, find carpools, or use transit. These programs can be implemented by employers, government programs, or both.
- **More workers teleworking.** As a result of employer-based incentives and new telework habits developed during the COVID-19 pandemic, the amount of people that will telework in the future will likely be higher than before the COVID-19 pandemic. Regional survey responses about telework preferences indicate that this is a reasonable expectation in years to come. In addition, workplaces would let employees come to work early or late some days to avoid traveling during rush hour.
- **Subsidies for not driving.** Employer-funded transportation benefits would be more supportive of non-SOV options. Many more employees would receive transit and carpool subsidies from their employer. Workers who currently receive free parking could receive the cash value of that benefit to pay for transit or other commuting options (known as parking cash-out.)
- **Reduced parking incentives at work.** Local governments and employers would stop subsidizing the cost of parking in the region's Activity Centers, where jobs and housing are concentrated. This would encourage more people to carpool or take transit. The new parking prices would vary based on distance from central business districts. Areas that currently do not charge for parking would charge lower amounts than those that already charge.

Visualize the Future

- **Getting cars off the road.** Imagine a future with fewer cars clogging the road, polluting the air and emitting GHG that contribute to climate changes. This initiative would take many cars off roads due to the number of people telecommuting and using alternate modes on any given day. Without needing to build any new roads or other infrastructure, this initiative greatly lessens congestion due to the vast reduction in people traveling alone in cars at any given time.
- **Reduced emissions.** Vehicle emissions would consequently decrease, greatly benefiting the region's air quality and environment.

TPB's Role

The TPB's Commuter Connections program is a regional network that provides commuter services and information to area residents and employers in the metropolitan Washington region to reduce traffic congestion and emissions caused by single occupant vehicles (SOVs). To support implementation of this initiative the Commuter Connections staff produced telework and flexwork materials including sample agreements and policy templates, FAQs, best practices for teleworking, and updated information on alternative work schedules. Find these on the **Commuter Connections website**. Learn more in the Travel Demand Management (TDM) section of this chapter.

Voices of the Region


Tyler Ingram/ Flickr

Survey

The survey asked all respondents that were currently telecommuting about their future telecommuting preferences. If given the choice to return to a work location once the COVID-19 pandemic is over, two-thirds said their preference would be to telework some days and commute to their work location some days (65 percent). One quarter wanted to telework full time (26 percent) and only 9 percent wanted to return to their work location full-time. Those who wanted to telecommute some days were asked how many days they would ideally want to stay home. Half wanted to telework three-four days (49 percent) and 41 percent wanted to telework for two days.

Focus Groups

Discussions touched on travel demand management including transit and telework. Some participants noted that the COVID-19 public health crisis allowed people in the outer suburbs to experience working from home. The majority of the participants said they appreciated the chance to avoid traffic and road safety issues that are commonplace for people from the outer suburbs. However, participants also said they feared that an increase in teleworking will reduce the pressure on transportation agencies to connect the outer suburbs to the rest of the region with expanded transportation choices.

Aspiration to Implementation

TPB asked: "How does having options to work from home affect your life?"

"The pandemic has forced a good deal of work to be done by telework. While not everyone can benefit from it, many white-collar workers can. Flexible telework allows me to structure my days more creatively to get both work and personal affairs done more efficiently."

"It has greatly benefited my life. I am more patient because I am spending less time in traffic, more efficient because I'm not rushing to finish to beat traffic to get home. And, I'm saving money by not purchasing as much gas for my car."

"I will save 4 hours of daily commute and no more before and aftercare payment. Better life for my children who no longer need to be up early to be dropped off."

Expand Express Highway Network

What is it?

Congestion-free toll roads where transit and carpool or vanpool with 3+ people ride for free. Dynamically priced lanes would be added to existing highways throughout the region. Traffic on these lanes would be free of congestion because of dynamic pricing—toll rates increase during the most congested times of day. And higher tolls would reduce demand on the lanes, keeping traffic free flowing.

Building on an emerging toll road network. Managed lanes exist today on new facilities in Maryland and Virginia. We are already seeing that toll and carpool lanes are the most likely way that we will be able to fund needed road projects in our growing region, even as we seek to reduce our dependence on driving. They would also encourage carpooling by exempting cars with 3+ people from the tolls.

New opportunities for transit. A new network of express buses would travel in the express lanes, connecting people and jobs throughout the region. The revenues generated from the tolls would be used to operate the new extensive regional network of high-quality bus services.

Visualize the Future

- **Less congestion, faster trips.** The expanded express lane system would reduce average travel times and congestion. Driving would be more reliable and predictable.
- **Speedy bus service.** Operating in free-flowing traffic would ensure reliable bus service. For people who cannot regularly afford to drive in toll lanes, express buses would provide an attractive and dependable way to take advantage of the congestion-free express lanes.
- **Expanded access to jobs.** Express lanes would expand economic opportunity, making it easier for commuters to know with certainty that they can get to work on time on a regular basis.

Examples of expressways in the region include the express lanes on I-66, funds from tolls on these lanes have raised substantial funds to support transit in northern Virginia. The Maryland 'Op Lanes' (the largest initiative of the MDOT SHA's statewide Traffic Relief Plan) planned for I-495 and I-270 are another example of dynamically managed lanes. This plan update includes three different segments of the proposed Op Lanes: (1) managed lanes on I-495 from George Washington Memorial Parkway to MD 187 and on I-270 from the I-495 to I-370, (I-270 southern segment) to be constructed by 2025; (2) managed lanes on I-270 from I-370 to I-70, (I-270 northern segment) to be constructed by 2030; and (3) managed lanes on I-495 from MD 187 to the Woodrow Wilson Bridge, referred to as the eastern segment, included as a study, not construction.

TPB's Role

The TPB has long championed congestion relief, documenting analysis and strategies in its CMP. Congestion impacts people and business traveling today. With forecasts for an additional 1.3 million people and nearly 1 million jobs by 2045, the challenge is not only to reduce congestion and transportation emissions but to mitigate growth in congestion and delay resulting from additional demand. Expressways that incentivize carpools and vanpools and expedite transit service, while using dynamic tolling to manage congestion, are one strategy that can help the region meet its goals.

Voices of the Region


MDOT/Flickr

Survey

The survey asked all respondents how big of a concern traffic congestion is to them personally. Over two-thirds of respondents (69 percent) say that congestion is a concern that impacts the quality of their lives, with 44 percent saying it is a significant concern. More than half of residents of the outer suburbs said congestion was a significant concern, which is significantly higher than residents of the Core (54 percent versus 27 percent).

Focus Groups

The expanded express highway network, working in coordination with the other initiatives, is a congestion-relieving tactic. Dynamically managed lanes, as supported by the TPB, would permit buses to operate at improved speeds and allow carpools and vanpools to ride for free. Nonetheless, the participants of the Focus Groups who identified as frequent drivers expressed significant concern about the cost and fairness of tolls noting that driving from the inner suburbs to the core of the region is an inequitable experience for those with limited income.

Aspiration to Implementation

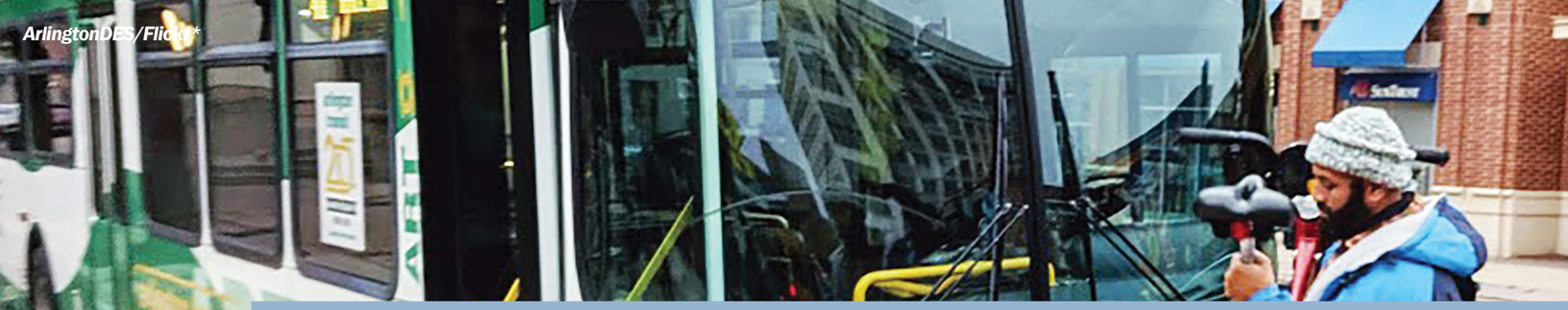
TPB asked: "How does having express toll lanes as an option affect your life?"

Responses regarding this initiative's impact were more varied, with several people feeling unsure about the strategy, others expressing equity and cost concerns, and others noting the benefit of reliable travel times, reduced congestion, and optional tolls:

> "Makes drives around DC area more certain in terms of how much time they will take."

> "Do not add toll lanes. This makes the expense of driving to work even higher—cutting back on how much I make per day. This especially effects people with hourly positions who aren't making that much per hour."

> "Allows me to decide how important it is to save time when traveling."


ArlingtonDES/Flickr*

Improve Walk and Bike Access to Transit

What is it?

More and better paths to transit. Our region doesn't have enough safe options for walking or bicycling to transit stops and stations. Often, there are barriers in the way, such as a lack of safe sidewalks or crosswalks, or a major road that cannot be crossed. If you live or work within a half mile of a rail or BRT station, you should be able to walk or roll to the station within 10 minutes on average, or easily bike to the station.

Removing barriers for walkers and bicyclists. Sidewalks would be built or repaired, crosswalks and bike facilities would be installed, and new trails would be constructed. Walking or biking would be comfortable and convenient.

Visualize the Future

- **Safe and comfortable.** Imagine having easy and safe access to transit, free of worry from gaps in sidewalk networks, poor lighting, or lack of safe crossings. Throughout the region, many more people would have safe and easy access to high-capacity transit—not only would this mean that people's personal safety while walking or biking to transit stations would improve—but it would also mean more people would choose to use transit because it would become a much more attractive option to them.
- **Providing key links.** First- and last-mile connections would provide access to jobs and other destinations with shorter commute times. Such cost-effective measures can improve Metro ridership and stimulate the economy. More people taking transit would take more cars off the roads, improving the environment and helping to reduce congestion for those who drive.
- **Easily move around your community.** Diverse economic activities would thrive if people can easily move around their communities. Older adults, people with disabilities, and transit-dependent populations would have more opportunities to get around without a car. Communities would benefit from increased street life and renewed vibrancy.

TPB's Role

With board direction to support implementation of this initiative, the TPB staff conducted the Transit Within Reach project that prioritized locations with the greatest need and opportunity to improve pedestrian and bicycle access to transit. These "Transit Access Focus Areas" (TAFAs) are distributed across the TPB's jurisdictions, serve a variety of transit systems, and all are located within a half mile of one of the region's Activity Centers. Forty-three out of 49 TAFAs are in Equity Emphasis Areas, which have high concentrations of low-income population and communities of color. In 2020, through Resolution R4-2021, the TPB adopted the TAFAs and asked TPB member jurisdictions to prioritize projects, programs, and policies that will implement improvements in the TAFAs.

To further advance its work with TAFAs and more broadly to promote implementation of the initiative, the TPB has established the Transit Within Reach Program to move small high-impact projects into preliminary design or preliminary engineering (30 percent). **See an interactive map and listing of the TAFAs online at: mwcog.org/maps/map-listing/tafa/.** To support and advance transit-oriented communities (TOCs) the TPB staff developed an **interactive web map** to build understanding and awareness of high-capacity transit (HCT) station areas, or areas around Metrorail, commuter rail, light rail, streetcar, bus rapid transit, and multimodal stations. Agencies and organizations can use the map to identify opportunities for enhancing housing and transportation connectivity in areas served by transit, with consideration given to benefits to disadvantaged populations by considering connectivity to and within EEAs.

Voices of the Region


Kelly Bell/Flickr

Survey

The survey asked which improvements or changes would make respondents more likely to walk, bike, or use an e-powered or mobility device to go to the train station or bus stop. The most popular choice was "if there were sidewalks and safe crossings all the way there" (36 percent), followed by if "my route to the train or bus was quicker or more direct" (27 percent). This shows that residents may experience a certain number of obstacles to getting to transit in a direct or safe way; for example if there are streets that are difficult to cross to get to a bus stop. This initiative recognizes the importance of these improvements to people in the region and how safety and connectivity impact how people choose to travel.

Focus Groups

The Focus Group findings revealed that improving bicycling and walking to transit can have positive impacts on equity goals, improving transportation access for people with lower incomes and historically disadvantaged communities. For the participants of the Focus Groups, the sense of feeling like a second-class citizen was emphasized in the conversation about feeling safe while walking or biking to transit. Participants felt like they have the bus stops and Metrorail stations that they needed but did not think that they had the methods to get there safely. The primary safety concern was being able to safely walk or bike to bus stops and transit stations, especially after coming from work at night. Some participants noted that to walk or bike to transit in the future they need to have the infrastructure—such as bike lanes, connected trails or bikes lanes, and protected bike lanes to use during night—in place to make them feel safe to do that. People in the inner suburb focus group noted the cost of getting to transit stations as a concern. People explained that they lived in areas in which biking and walking to transit did not feel safe. As a result, people had to take a bus to get to the train station. The cost of taking the bus plus the train made their commute cost high to the point that it was no longer feasible. Similar to the experience from people with low incomes, people from the inner suburbs also said that they are forced to decline jobs because the commuting cost would exceed the income that they would bring home.

Aspiration to Implementation

TPB asked: "How does having an easy walk or bike ride to your bus or train affect your life?"

"Knowing that my walk to my transit stops is reliable lets me plan my commute with confidence. The fact that my house is near a station or stop also makes it easier to use public transportation when the weather is bad. That consistency lets me keep transit and climate change in my mind."

"It affects my ability to make it to places such as doctors appointments and getting groceries. I am thankful that there is at least a bus system in this area and the Metro isn't too far away, but traveling sometimes involves walking on the side of highways that don't have any or adequate sidewalks, which feels very unsafe...Having more sidewalks and paths that are pedestrian friendly would make it easier to get to places in Virginia, from towns, to even stores."

"Having an easy walk or bike ride means that I'm more likely to go out to the movies, eat out, sit in the parks, and meet my neighbors. It means fewer trips done by car to see friends and get to work and less pollution in my neighborhood and in the region overall. It helps me stay fit and mobile even with post-COVID health issues. It helps me improve my mood, being able to move my body as part of my travel or commute."

Complete the National Capital Trail Network

What is it?

The National Capital Trail Network is a long-distance, continuous network of low-stress, mostly off-road bicycle and pedestrian trails that will serve the entire metropolitan Washington region. The network will be over 1,400 miles long when complete, with 645 miles already built.

Visualize the Future

Access for People of All Ages and Abilities. People will be able to get on these trails and be confident that they can go as far as they like, from one end of the region to the other, on a facility network that minimizes stress and supports safety.

Access to Opportunities. When complete, the trail would connect 136 of the region's Activity Centers, where jobs, housing, and transit are concentrated. Over 4 million people and 2 ½ million jobs will be located within a half mile of the network. People will be able to bike or walk to jobs, school, or entertainment.

Access to Nature. The trail network will provide healthy, low-stress access from cities and neighborhoods to parks and rural areas.

TPB's Role

Through regional analysis and member input, staff produced a framework for the National Capital Trail Network, a long-distance, continuous network of low-stress, mostly off-road bicycle and pedestrian trails that will serve the entire Washington region. Approved by the board in 2020, the network will be updated over time. **See an interactive map of the National Capital Trail Network as approved 2020 online at mwcog.org/maps/map-listing/national-capital-trail-network/.**

Voices of the Region

Survey

The Voices of the Region survey asked respondents which improvements would make them more likely to use a bicycle. While 42 percent said that no change would make a difference to them, the top substantive choices were related to bicycle infrastructure: If "bicycle lanes and routes were more direct and complete" (34 percent), followed by if "bicycle lanes were separate from vehicles by a barrier" (32 percent) and if "there were bike lanes or trails near my home" (31 percent). This initiative responds to each of these preferences, by better linking communities via a network of trails separated from vehicle traffic.

Focus Groups

Findings revealed that a connected network of trails is desired for both recreation and transportation, improving access and pedestrian and bicyclist safety. Participants noted trails are lacking in parts of the region.

John Brighenti/Flickr

Aspiration to Implementation

TPB asked: "How does having a connected network of regional trails affect your life?"

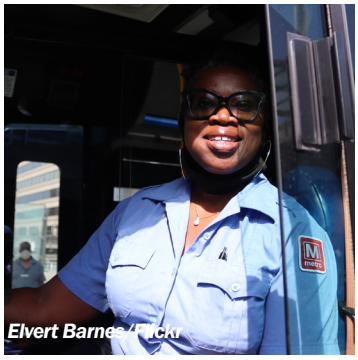
> "It is a great initiative which will definitely help to develop the area more functionally and enhance the living resources in the neighborhood, as particularly we like to have walks with my 4 year old son with development delay and explore the new unknown destinations and be closer to the nature."

> "Safe, well-maintained regional trails impact me massively. Cycling is my preferred mode of transportation, so more trails- especially trails that lead to centers of business, shopping, and dining-means I'm spending less time on the beltway, reducing emissions, and improving my health. As an overweight guy, I cherish any opportunity to fit some exercise into a busy schedule."

> "Currently I use the trails mainly for fitness and recreation. I would prefer to use my bicycle for transportation whenever possible, and I use the trails when available. Some of the trails connect areas in better, safer ways to where I'd like to go, but there are some routes they do not cover that are dangerous to ride by bike. I would like to see more routes designed for efficient commuting in my area, not just recreation."

> "It helps me get to where I need to go through an alternative commute while enabling me to live a healthier and happier life."


MDOT/Flickr


Elvert Barnes/Flickr


Joe Flood/Flickr


Kelly Bell/Flickr

How to Support the Aspirational Initiatives

TPB: Members can consider how and where in their jurisdiction or agency's planning and policy processes the jurisdiction or agency can take action toward the Aspirational Initiatives. While barriers such as funding silos and long project development timelines are legitimate constraints, when possible, seek opportunities to prioritize or expedite projects, programs, and policies that align with the initiatives.

Technical Staff: Staff to TPB members can consider how initiative concepts can help to solve local and regional challenges. Staff can use the EEA tools and findings from other TPB studies and research to inform the development of projects, programs and policies. Staff can review, share, and consider the implications of the Voices of the Region's findings to inform or enhance project, policy and program development.

The Public: Members of the public can participate in the local planning process through avenues such as local surveys, focus groups, social media, and community planning and budget meetings. The public can participate in local meetings about new development and transportation projects. They can support initiatives that they find important and emphasize what project features and outcomes are most important to them. People can write to local leaders to show support for the initiatives and projects that align with the ideas behind these initiatives such improving bike and walk access to transit. A few specific examples include:

- Show support for new BRT and transitways plans projects in your jurisdiction. Support funding the projects and project features that make these projects successful, such as level boarding, dedicated lanes and transit signal priority.
- Support new transit-oriented development and affordable developments in your jurisdiction to help make room for more people in our region.

Organizations: Share the TPB's Aspirational Initiatives with stakeholders. Promote or support implementation of the initiatives that align with the agency's mission.

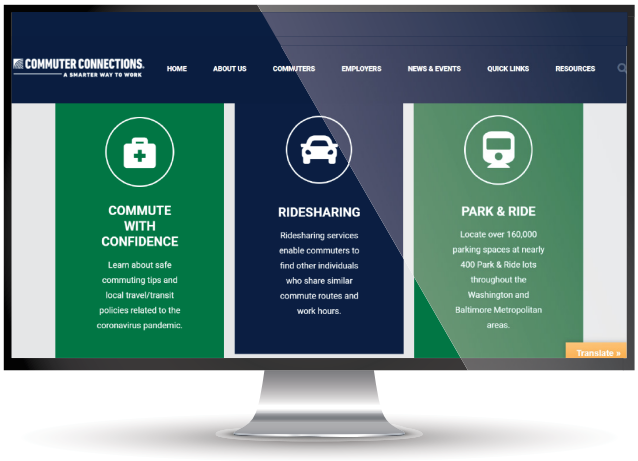
Everyone: Share the animated videos and infographics that the TPB has produced to communicate the concepts and benefits of the Aspirational Initiatives. **Find these at Visualize2045.org.**

Transportation Options

As a growing and diverse region, metropolitan Washington needs a transportation system that provides a wide range of ways to get around. Through the TPB, transportation agencies in the region work together to provide more convenient and affordable transportation options, allowing each person to choose what works best for them. This update to Visualize 2045 emphasizes the need for transportation options, programs, and policies that will help the region work together to address climate change, improve safety, and advance equity in the region. Strategies include the integration of the transportation system and access to more transportation choices, such as riding transit, walking, or biking, so that everyone can connect more easily to activities, services, and opportunities.

Transportation Demand Management

Many of the strategies in this section represent Transportation Demand Management (TDM) approaches intended to help people find and use alternatives to driving alone. TDM uses marketing, incentives, and employer-based programs to reduce congestion and improve air quality. Commuter Connections is the TPB's TDM program. The Commuter Connections regional network provides commuter services and information to area residents and employers to reduce traffic congestion and emissions caused by single occupant vehicles (SOVs). The outreach mission creates awareness of SOV alternatives and their resulting benefits, to build the Commuter Connections network as an umbrella resource that provides support services to network organizations and individuals who currently drive alone, and to facilitate those who are seeking to change SOV behavior by providing information about commute alternatives. The Commuter Connections network primarily promotes activities including ridesharing, using transit, bicycling, walking, teleworking, and employer services.



Equity Considerations

Providing travel demand management means increasing access to travel options and telework that can expand the number of jobs that a person might be able to access within the region and help employer or government TDM incentive programs to reduce travel costs. Shorter and non-SOV commutes can reduce emissions and provide health benefits to commuters. While many lower-paying jobs do not have telework as an option, promoting telework in the region helps reduce congestion for those that need to drive or take transit to go to and from work.

TPB's Role

Commuter Connections is the major demand management component of the TPB's congestion management process (CMP) that helps support regional air quality goals. Its products and services are provided to member agencies through central program administration, implementation, and monitoring of tasks outlined in the annual Commuter Connections Work Program. Approximately 30 independently run programs are members of the Commuter Connections network. Each has its own funding sources, budgets, goals, staff, and operational strategies. Many of the operational logistics are carried out at the local level and

coordinated regionally through subcommittees and ad-hoc groups, which meet regularly and as needed. Commuter Connections network members also assist employers to start or expand commuter benefit programs. The TPB staff provides regional resources such as telework and "flexwork" policy templates that employers can use to tailor their worksite programs. Regionwide incentive programs such as Guaranteed Ride Home, CarpoolNow, Flextime Rewards, 'Pool Rewards program, and incenTrip can help nudge commuters out of their SOV mode into ridesharing, transit, and active transportation modes of travel. This allows for each jurisdictional program to have its own strategic TDM plan based on local resources and needs. The Commuter Connections Subcommittee provides overall technical review and input into program services. **More information about Commuter Connections can be found at commuterconnections.org.**

Visualize the Future

The Commuter Connections program is generally regarded as among the most effective commuter assistance programs in the nation in terms of reducing vehicle trips and vehicle miles traveled. During the COVID-19 pandemic, surveys show there was a significant increase in telework, walking, and biking, while there was a decrease in transit and driving. While short-term impacts of the pandemic were significant, the long-term impacts on travel behavior are unknown The TPB will continue to monitor system usage through its various programs, including the 2022 State of the Commute Survey and will forecast transportation system usage based on objective information and sound planning assumptions. Looking to 2045, when another 1.3 million people and nearly one million jobs will be added to the region, the importance of managing transportation

Bossi/Flickr

demand will only increase. Enabling people to not drive alone in the future will make the region's air cleaner and will help meet the 2030 GHG reduction goals of the COG Climate and Energy Action plan (endorsed by the TPB in 2020), and will help reduce congestion on the roads.

The sponsors for the projects in the constrained element identified 42 projects as implementing the Aspirational Initiative that focuses on transportation demand management: Provide More Telecommuting and Other Options for Commuting. The sponsors also identified hundreds of other projects that improve or expand alternatives to driving, a key feature of transportation demand management. See a summary table by project type in Chapter 7, Funding the Transportation System. Projects examples in the constrained element that promote TDM and descriptions of benefits from project sponsors include the White Flint District East and West (CE5985 and CE5986) in Montgomery County that supports expanding BRT and providing access to BRT and Metrorail.

Ongoing Challenges

TDM faces many challenges in influencing commuters to choose other ways to get to work. Concerns related to public health following the COVID-19 pandemic might impact people's attitudes when choosing to drive or take transit. Commuters may not understand the value of carpools or vanpools because they may have trouble quantifying how much time they spend commuting. As commuters seek housing that they can afford, they may not find sufficient affordable housing near high quality transit options. Employer policies may also encourage driving by offering free parking and low gas prices may encourage more people to continue to drive alone.

Digital Creators/ Flickr

Table 6.1: Commuter Connections Program Daily Impacts (2018 – 2019)

Measure	Reduction
Vehicle Trips	137,000
Vehicle Miles of Travel	2,648,000
Nitrogen Oxides (NOx)	0.5 Tons
Volatile Organic Compounds (VOC)	0.4 Tons

The Policy Context

Impact of the Aspirational Initiatives

Transportation Demand Management is the basis for the telework and other commute options initiative that implement priority TDM and CMP strategies.

Planning Factors

- Protect and enhance the environment, promote energy conservation and improve the quality of life.

RTPP Goals

- Provide a comprehensive range of transportation options.

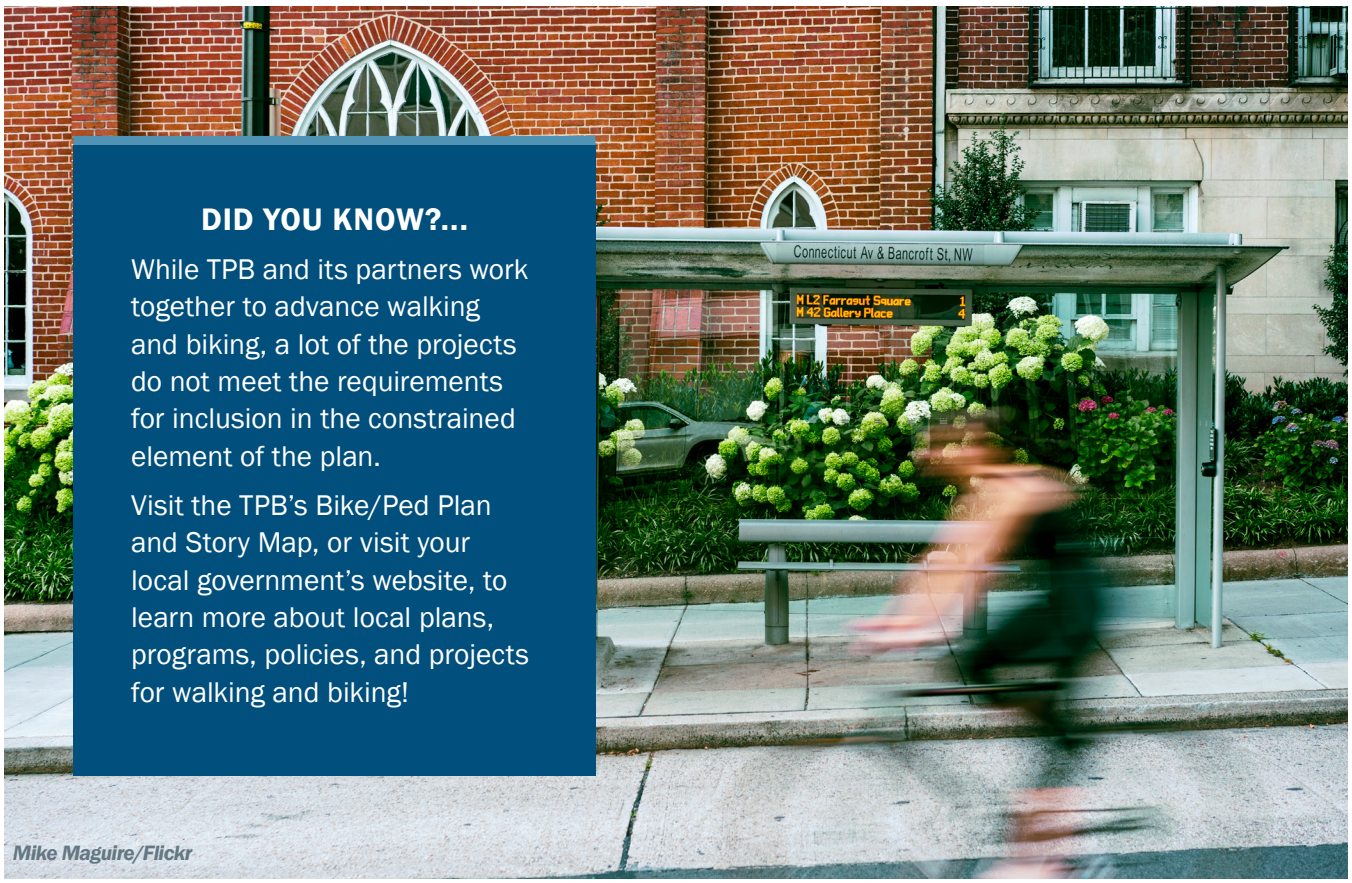
Bicycles, Pedestrians, and Micromobility

The metropolitan Washington region is a national leader in bicycle and pedestrian-oriented community design. Bike sharing, protected bike lanes, bike trails, and bike parking have been critical to the success of new developments such as the Wharf in the District of Columbia and Potomac Yard in Alexandria. Projects like the National Capital Trail Network, a 1,400-mile trail network, which is one of the TPB priority initiatives, are knitting existing disconnected trails across the region into a true network. Projects such as the Washington Boulevard Trail, the Bethesda Trolley Trail, and the Rhode Island Avenue Trolley Trail are linking residential and commercial areas to nearby parks, transit and other community assets. As of 2019, about 3.3 percent of work trips in the region were on foot, scooter, or bike.[28]

Currently, there are over 800 miles of bike paths and over 400 miles of bike lanes in the region. Since 2014, the region has added roughly 350 miles of paved bike paths and bike lanes to the network, or roughly 60 miles per year. Walking and biking are forecast to increase at much higher rates than any other mode of travel. Where trails can be added alongside rail and utilities, further expansion is possible. See the performance analysis summary in Chapter 8, Planning for Performance. An additional 2,445 miles of bicycle and pedestrian facilities are planned through 2045, including over 1,200 miles of shared use paths, 600 miles of standard bike lanes, and 190 miles of protected bike lanes.

Equity Considerations

Some income and historically disadvantaged populations live in areas that have high levels of walking but substandard or missing pedestrian and bicycle facilities.



DID YOU KNOW?...

While TPB and its partners work together to advance walking and biking, a lot of the projects do not meet the requirements for inclusion in the constrained element of the plan.

Visit the TPB's Bike/Ped Plan and Story Map, or visit your local government's website, to learn more about local plans, programs, policies, and projects for walking and biking!

Mike Maguire/Flickr

28 Commuter Connections 2019 State of the Commute Survey Report published June, 2020

Pedestrian and bicyclist fatality rates are higher in Equity Emphasis Areas (EEA), small geographic areas that have concentrations of low-income and/or minority populations.

The Bicycle and Pedestrian plan includes 293 pedestrian and bicycle projects that will be in an EEA: 72 percent of EEAs will get at least one project. These projects can improve the transportation access and safety for the historically disadvantaged populations living in EEAs. The plan includes projects judged to have regional significance but does not include most sidewalk projects. The National Capital Trail Network will pass within half a mile of 136 of the region's 141 Activity Centers, as well as 308 of the 351 EEAs, connecting them to jobs, shopping, parks, and other amenities.

TPB's Access for All Committee provides input into the design and operations of trails and sidewalks, particularly relating to the resolution of conflicts between bikes, e-scooters and pedestrians with disabilities.

TPB's Role

As long-time regional priorities, biking and walking are highlighted in the TPB's Vision, RTPP, and in Visualize 2045. As more jurisdictions have added micromobility options, the TPB staff has hosted bikeshare and e-scooter workshops to coordinate and share information. In 2012, the TPB adopted a regional Complete Streets policy that helped build a consensus that the transportation system should provide safe and adequate accommodation for all users. Today, all three states and 91 percent of the local jurisdictions in the region have a Complete Streets policy. The effects can be seen throughout the region as new road projects routinely include bicycle and pedestrian facilities.

The 2015 Bicycle and Pedestrian Plan for the National Capital Region identifies the capital improvements, studies, actions, and strategies that the region proposes to carry out by 2040 for major bicycle and pedestrian improvements in state, local, and agency plans. An updated plan is due for public release in Spring 2022. **More information about the plan can be found at mwcog.org/BikePedPlan.**

Ted Eytan/ Flickr

DDOT DC/ Flickr

The Policy Context

Impact of the Aspirational Initiatives

Completing the National Capital Trail Network and focusing investments in Transit Access Focus Areas will help complete networks and improve connectivity for people who choose to walk, bike, or use e-scooters to get to transit and other destinations.

Planning Factors

- Increase the safety of the transportation system for motorized and nonmotorized users.
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.

RTPP Goals

- Provide a comprehensive range of transportation options.
- Promote a strong regional economy, including a healthy regional core and dynamic Activity Centers.
- Maximize operational effectiveness and safety of the transportation system.

The TPB's Bicycle and Pedestrian Subcommittee oversees the maintenance of the regional Bicycle and Pedestrian Plan and advises other TPB planning areas and initiatives. The subcommittee advised on the plan for the National Capital Trail Network, which the TPB adopted in 2020. The subcommittee also helps state and local agencies share information and coordinate their bicycle, pedestrian, and micromobility planning efforts.

The TPB provides technical assistance grants to its member agencies and partners to design and construct projects that improve pedestrian and bicycle access. The TPB's activities include "Street Smart," a cost-effective regional media campaign that draws attention to the human impact of unsafe driving. Through Commuter Connections programs such as Bike-to-Work Day, COG and the TPB promote bicycling as a commuter option.

Visualize The Future

In the future, as agencies complete projects in Transit Access Focus Areas, complete the National Trail Network, and construct other projects that improve connectivity, people in the region will have even more options to travel throughout the region by foot, bike, or scooter. More trails, sidewalks, and ways to get around safely and comfortably will inspire more people to choose biking, walking, and micromobility options. It will also minimize congestion by taking cars off the roads, improve the environment, and provide a healthy way to travel.

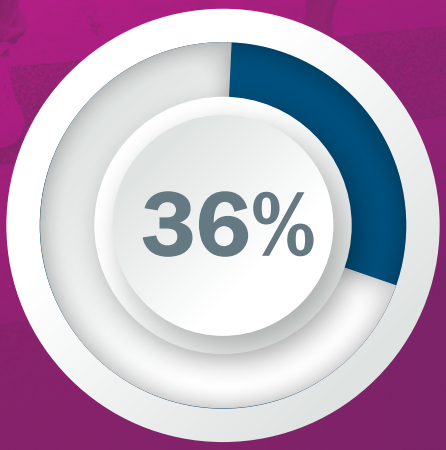
The sponsors for the projects in the constrained element identified numerous projects that promote, enhance, or support improved active travel, including 211 projects that make it easier to walk and 205 projects for people that bike or use micromobility options such as e-scooters. They also identified 162 projects that implement the initiative "Improve Walk and Bike Access to Transit" and another 32 that implement the initiatives to "Complete the National Capital Trail Network". For example, in the District of Columbia, the Pennsylvania Ave SE (CE3654) project will build bike lanes past the Eastern Market Metrorail Station. Also, in the District of Columbia, the project to Reconstruct New Jersey Avenue NW from H Street to N Street (CE3399) improves safety, neighborhood connectivity, and mobility for all modes. The project includes a protected intersection to improve safety for cyclists. Beyond the constrained

Jeff Vincent/Flickr

Voices of the Region

A FEW KEY SURVEY RESULTS:

When asked which improvements or changes would make them more likely to walk, bike, or use an e-powered or mobility device to the train station or bus stop, the most popular choice was "if there were sidewalks and safe crossings all the way there" (36%), followed by if "my route to the train or bus was quicker or more direct" (27%).



36% of respondents would consider using a shared e-scooter or e-bike to take short trips (less than one mile) to transit or other destinations.

Younger respondents were significantly more likely to select "Yes" relative to senior respondents (56% vs 9%).

element, transportation agencies are moving forward numerous projects through the Transportation Alternatives program. The TPB provides technical assistance through the Transportation and Land-Use Connections (TLC) and Transit Access Focus Area (TAFA) programs to advance this planning area, including funding the Suitland-Silver Hill Neighborhood pedestrian and Bike Access Improvement Project in Prince George's County, MD.

Ongoing Challenges

The boom in walking and bicycling has been largely confined to the urban core and a few places in the inner suburbs. Much of the region is built around driving, but the implementation of Complete Streets policies and the National Capital Trail Network is providing more networks and connections for people that choose to walk and bike. Safe and adequate accommodation for people that walk and bike is a challenge in low-density communities. At the same time, the growth of new micromobility modes can create conflicts with pedestrians.

Jack Prommel/ Unsplash

Beyond DC/Flickr

Transit

The region boasts one of the premier public transit systems in the country. Metro moves hundreds of thousands of people—commuters, students, and tourists each workday on rail, bus, and paratransit. See Chapter 2, "Where are We Today?" for usage statistics. Commuter rail services in Maryland (MARC) and Virginia (VRE) and dozens of local bus and other transit providers move many thousands more. Together, these transit services play a critical role in providing affordable transportation options, sustaining economic vitality, providing high-quality alternatives to driving, building communities, and reducing environmental impacts. Transit ridership has been significantly impacted by the pandemic, with changing travel patterns and services, and the rise of telework, long-term impacts are not yet known. Learn more in Chapter 2.

Transit planning in the region involves all transit agencies and jurisdictions as well as various regional organizations. WMATA operates Metrorail, Metrobus, and MetroAccess, which together carry close to 85 percent of all public transportation trips in the region. WMATA has its own planning documents, and in 2020 concluded a regional effort to reimagine bus service in the region, the "Bus Transformation Project." DDOT, the MDOT MTA, and the Virginia DRPT also engage in transit planning, such as MDOT MTA's 2020 **MARC Cornerstone Plan**. Local jurisdictions and operators develop more detailed plans for transit service, typically published as Transit Development Plans or Transit Strategic Plans. A summary of these plans is included in Appendix J. Other regional organizations plan for transit, including the NVTC, which is leading development of the proposed VA-7 BRT line and providing transit operating funds, and the NVTA, which conducts multimodal planning and funds transit capital projects.

Equity Considerations

Many essential workers depend on transit to reach their jobs, and in turn, many of these people are also from population groups (e.g., people of color, low-income households, non-native English speakers) and communities that face historical disadvantage and marginalization in access to transportation. This was of critical importance during the pandemic when transit services were drastically reduced in March 2020. As transit service was restored in 2021, there is greater focus on ensuring restoration and improving access to public transportation for these groups.

In 2021, the TPB commissioned a white paper and analysis of transit service in the region and the needs of the population during the pandemic but also looked at needs beyond the pandemic to when normal transit service is restored. The analysis assessed bus service (route coverage, frequency, time of day, and span of service) during the pandemic for those living in the region's EEAs, historically disadvantaged populations, and low-wage workers. It also compared current service to pre-pandemic service. The analysis examined how equitably service is distributed and identified gaps in that service that could be filled to improve equity.

The key finding from the white paper analysis was that overall, marginalized groups have more access to transit when compared to the region as a whole:

- 65 percent of people of color, and 74 percent of low-income households are within a one-quarter mile of a bus stop, compared to 60 percent of the region as a whole.
- 44 percent of people of color, and 54 percent of low-income households have access to high frequency (every 15-minute or better) service in the morning peak period, compared to 41 percent of the region as a whole.

However, when looking at low-wage workers, only 61 percent are within one-quarter mile of a

Voices of the Region

A FEW KEY SURVEY RESULTS:

Improvements to the Transportation Infrastructure

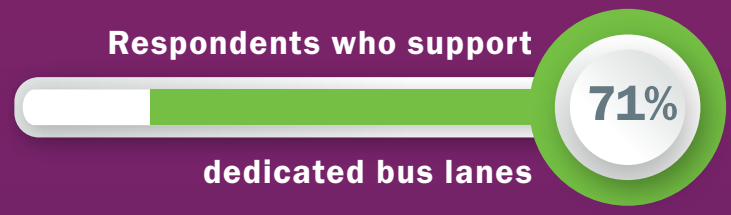
Over half of regular transit user respondents indicated real-time bus information at bus stops would be the largest factor to make them more likely to take a bus. Users also identified shade (43%) and adequate lighting (27%) as important factors. Reliable on-time performance would be the most significant improvement to their bus ridership experience.

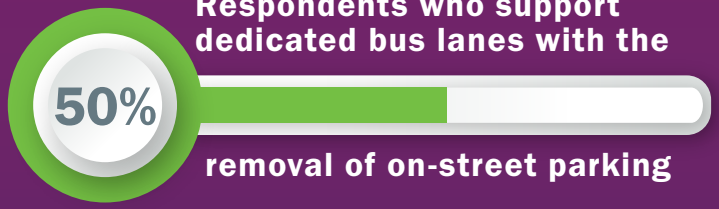
To improve rail transit, survey respondents prioritized more frequent (40%), and less crowded (35%) trains.

Future Transportation Investments

Improved/expanded public transportation service was one of the most often mentioned transportation investments that future generations would thank us for tomorrow.

BROADER OPINION RESPONSES:





bus stop, and this figure drops to 31 percent for high-frequency, peak period service. This illustrates that these populations have significantly less access to bus service when compared to the overall population.

TPB's EEAs have a higher percentage of residents within a one-quarter mile of a bus stop for every analyzed sub-group, often by a factor of 20 percentage points. However, this is compared to the entire region, which is overall less dense than the EEAs.

TPB'S Role

The TPB, as the MPO for the National Capital Region, closely coordinates with the states, local jurisdictions, transit agencies and other organizations in the planning and programming of public transportation improvements. Transit projects using federal funds or those that are regionally significant are included in the LRTP, the TIP, and in modeling and analysis used to meet federal surface transportation and environmental requirements. Transit service is a key component included in the regional travel demand model used to forecast future travel demand and meet air quality requirements.

Beyond federal requirements, the TPB interfaces with its members on issues related to public transportation, including governance, funding, equity, the environment, safety, and other areas of interest. The TPB's Regional Public Transportation Subcommittee was formed by resolution of the TPB on January 17, 2007, as the Regional Bus Subcommittee. Its mission is to provide a permanent process for the coordination of bus planning throughout the metropolitan Washington region, and for incorporating regional bus plans into the LRTP. The subcommittee reports to the TPB Technical Committee on issues and interests of the region's public transportation providers.

In response to the federal Surface Transportation Act Moving Ahead for Progress in the 21st Century (MAP-21), and the requirement for increased representation of public transportation on MPOs, the TPB passed a resolution in September 2014 declaring itself in compliance with MAP-21. It also called for further dialogue and the reconstitution of the TPB's Regional Bus Subcommittee as the Regional Public Transportation Subcommittee (RPTS) to include all regional providers of public transportation. The mission, goals, and membership of the reconstituted subcommittee were approved by the TPB Technical Committee. The TPB develops an annual "State of Public Transportation" report to communicate public transportation provider interests to the TPB.

The Policy Context

Impact of the Aspirational Initiatives

Expanding BRT and transitways throughout the region with improved bicycle and pedestrian connections would provide more people access to high-capacity transit and additional connectivity to destinations throughout the region, including making existing and future intercity bus stations more accessible for all. Expanding Metrorail core capacity would provide logistical ease and comfort for those traveling by Metrorail to and from the region's numerous destinations served by Metrorail, including intercity bus stations.

Planning Factors

- Enhance travel and tourism.
- Increase the accessibility and mobility of people and for freight.
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.

RTPP Goals

- Promote a strong regional economy, including a healthy regional core and dynamic Activity Centers.
- Support inter-regional and international travel and commerce.

Mario Sessions/Unsplash

Visualize the Future

Sponsors for projects in the constrained element identified numerous projects that promote, enhance, or support transit, including 67 that enhance or expand Metro infrastructure, 30 for commuter rail, nine for streetcar or light rail, and 30 for BRT, 92 for commuter/express bus, 102 for Metrobus, and 205 for local bus. Hundreds of projects support the TPB's policy priority of walking and biking, which can improve access to transit.

The project sponsors identified 162 projects that implement the initiative "Improve Walk and Bike Access to Transit" and another 47 that implement the initiatives to "Expand Bus Rapid Transit and Transitways". Example projects and benefits identified by the sponsors include the H&I Street Bus Lanes transitways project (part of T3212) which provides increased reliability in transit options for commuting to and through the downtown core bringing jobs and housing closer together. The 16th St NW Transit Priority project (T6638) will add bus lanes on a major bus route increasing the speed and reliability of bus lines utilized by thousands of riders every day. In Prince William, Virginia, the VRE Broad Run expansion (CE2420) will promote high-capacity transit by expanding service on the VRE Manassas line and improving station access. In Montgomery County, MD, the US 29 Bus Rapid Transit Phase 2 project (CE3765) will expand BRT, improve access to Metrorail at Silver Spring Metrorail Station, and "Improve Walk and Bike Access to Transit". **For more examples, see Chapter 7 or retrieve the full policy documentation on the Visualize 2045 website.**

Regional planning and investment in customer centers, transit facilities, and a modern rail and bus fleet are needed to ensure that transit service is an efficient, effective, and attractive transportation choice. In the long-term, a renewed emphasis on transit-oriented communities will provide expanded mobility for all travel options. Transit providers are also investing in electric buses and other clean technologies that will have environmental benefits. As Bus Rapid Transit (BRT) routes are added to the region's transit network, jurisdictions and agencies need to work together on integration, compatibility, customer information, and overall coordinated regional transit planning. Going forward, the region needs to identify and plan for transit fleet and facility needs to meet forecasted population and employment growth and regional goals for reducing vehicle-miles traveled (VMT) per capita and increasing transit mode share.

Primary objectives include:

- Improved quality of service for customers is the number one priority, including information, accessibility, security, and safety.
- An integrated network of regional bus service, including commuter bus and routes connecting regional hubs.
- Regional transit, intermodal transfer centers, and intercity bus centers are needed at Activity Centers and regional hubs to provide customers with access to jobs and amenities and to connecting transit services.

Ongoing Challenges

Beyond implementation of the Aspirational Initiatives, more detailed and complementary opportunities exist for investment in public transportation. Funding transit at the levels needed for reliability and frequency in all areas is an ongoing challenge, as are the capital investments needed to maintain the systems in a state of good repair and to expand capacity. Continuing investments are focused on improving bus access to regional hubs and Activity Centers through bus priority treatments along major arteries and at the access points, including transit signal priority (TSP), queue jumps, and bus-only or transit/HOV lanes. In addition, central bus storage/layover sites are of importance for downtown DC, as well as inner suburb Activity Centers such as Rosslyn and Silver Spring, where there is strong demand for transit service. Hundreds of local, commuter, tour and intercity buses need locations to layover at transit hubs; a critical need in providing efficient, on-time service. Other investments are in bus stop rationalization and improvements along with curbside management so that transit connections are safe, easy, and accessible for mobility needs customers. Finally, fleet facilities for maintenance and storage are needed in locations that match service needs.

Beyond DC/Flickr

Intercity Travel: Buses and Rail

Intercity buses connect the metropolitan Washington area to New York City, Philadelphia, and other major cities or destinations. These buses serve thousands of person trips daily.

In addition to privately operated bus services offered by companies such as Greyhound, Megabus, and Peter Pan. Virginia funds The Breeze intercity buses, with the initial 2017 route serving Blacksburg, Staunton, and Front Royal. New routes from Dansville via Lynchburg and Charlottesville and from Martinsburg via Richmond were added in 2021—all connecting into Union Station in downtown DC. The region also benefits from multiple commuter bus options that provide car-free travel to and from major employment centers.

The region has a major terminal for intercity Amtrak passenger rail traveling up and down the East Coast as well as west to Pittsburgh and Chicago, southwest to Atlanta, and south to the Carolinas and Florida. While many travelers are heading north, Lorton, VA, is the northern terminus for Amtrak's Auto-Train service to Sanford, FL (Orlando). In addition, Virginia is investing significantly in improving rail service in the state, both leading the new Long Bridge project across the Potomac River as well as purchasing the right-of-way for construction of additional tracks on the DC-Richmond corridor and expanding service to other parts of the state and onwards to North Carolina.

Equity Considerations

Intercity fares are mostly at market rates, with some discounts for frequent travelers. Public support for intercity travel has primarily been through investment in terminals. However, Virginia's support for The Breeze service offers a model for expansion of intercity bus services to additional destinations at reasonable prices. Other opportunities to provide intercity travel options to low-income residents should be explored.

TPB'S Role

The TPB's Regional Public Transportation Subcommittee, whose mission is to provide a permanent process for coordinating public transportation planning throughout the region, discusses coordination with intercity travel operations and customer needs. The TPB conducts planning activities to support intercity bus planning, most recently, it conducted a count in 2016 to inform the 2017 report: **Intercity Bus Traffic and Patronage in the Metropolitan Washington Region**.

Ongoing Challenges

As the region continues to experience population and economic growth, there will be additional competition for station locations and staging areas for intercity buses, commuter buses, and tour buses in Activity Centers. The development and implementation of a regional strategy for intercity bus terminal and storage is needed to provide support for the bus industry, public and private.

Visualize the Future

The sponsors for the projects in the constrained element identified 36 projects that promote, enhance, or support intercity bus, and 14 projects that support travel on Amtrak. For example, the project sponsors for the expansion of the Long Bridge with the Virginia Passenger Rail Authority Rail Capacity Projects (T6727) and the Alexandria 4th Track Project (T6673) indicated that the projects will double the long-term capacity for passenger and freight rail traffic and improve the reliability and connectivity of rail service. This expansion will contribute to a more cohesive railroad network connecting the areas between Richmond, VA, and Baltimore, MD.

An expanded network of intercity bus and rail travel options could provide for increased mobility outside of the private automobile, providing more options for youth, seniors, and traditionally underserved groups that do not have access to or are not comfortable using private automobiles for long-distance trips. Plans for Union Station in the District of Columbia to expand the station and increase rail and intercity bus options could be complemented by investment at other intercity terminals and services. As more expressways are implemented in the region, buses using the managed lanes will benefit from faster and more reliable travel, reducing travel time and delays.

Ivan Radic/Flickr

Voices of the Region

A FEW KEY SURVEY RESULTS:

Congestion Concerns for Outer Suburbs

More than half of residents of the outer suburbs said congestion was a significant concern (54%), compared to (27%) of residents in the region's core.

REAL PEOPLE WITH REAL VOICES:

"I think more and more people are going to be moving farther out, especially if telework continues for most people. More people are going to move out where the housing is more affordable, and I hope that the planning board people are going to be thinking about how to make those areas more accessible with the buses, with the trains, what people are talking about. Just realizing that more and more of these places that seem farther away need to be connected as more people move out there."

— Resident of Ashburn, VA

Driving and Riding in a Vehicle

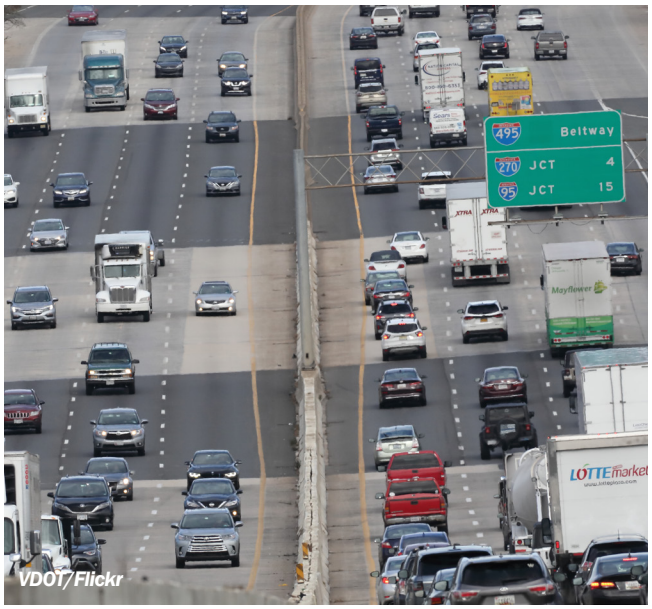
The region's extensive highway and road network provides connectivity for people and goods to destinations across the region. Every day, millions of people travel on our region's roads to access jobs, schools, and medical care, as well as shopping, entertainment, and recreational opportunities. Roads also carry most goods delivered to homes, schools, businesses, and stores in the region. The TPB encourages people who travel in vehicles to share the ride through carpooling when possible. In the last decade, rideshare and ridehail services have grown creating new opportunities for people to share rides, or use a vehicle as-needed rather than investing in a vehicle, but these services could also encourage more trips in cars. The 2017-2018 Regional Travel Survey reports nearly three times the amount of taxi and ridehail travel in 2017-2018 compared to the 2007-2008 survey. The TPB continues to monitor the impact of these services on transportation demand and travel choice, especially given recent short-term disruptions to travel trends due to the COVID-19 pandemic. Long-term impacts of the pandemic remain uncertain.

The responsibility for planning and investing in the region's roadways is shared by state, county, and local transportation planning agencies. Generally, each road has an owner that is responsible for how that roadway functions, including roadway performance and congestion, maintenance, safety, and alignment with Complete Streets policies. Maintaining facilities in a state of good repair is a critical, if unsung, emphasis of transportation agencies' future investments, whether bridge or pavement conditions, traffic signals, lighting,

signage, or other infrastructure. While all roads in the region form the network that connects our communities, only those projects of regional significance that are required for inclusion in the region's air quality analysis or that use federal funding are included in the constrained element.

Equity Considerations

Each part of the transportation system plays a unique role in connecting people to life's destinations. The region's roadways provide access to jobs, education, and recreation from the suburban residential and employment areas that are not presently served by high-capacity and frequent transit. While the region's transportation agencies continue to enhance transit, walking, and biking options, for some people, traveling by vehicle is their preferred or most practical and economic choice for commuting to work, school, caring for family or participating in other life activities. The relationship of affordable housing and transportation choices is closely linked, as much of the region's housing that is more affordable tends to be in suburban and non-urban areas that lack frequent and rapid transit, which leads to a reliance upon driving. Carpooling can create economic opportunities for traveling on HOV or carpool-eligible lanes.



VDOT/Flickr

TPB's Role

While encouraging a range of multimodal solutions and travel demand management, the TPB is committed to improving conditions for people that travel by vehicle. The TPB has a long history of developing potential strategies that members implement around the region to improve the driving experience, from maintaining roads and bridges in a state of good repair for safety and comfort, to managing congestion through a range of strategies that improve travel time and reduce delay that TPB documents in its Congestion Management Process (CMP). Through its safety program, the TPB also helps to improve the safety for all people using the transportation system. Learn more about the TPB planning activities to reduce congestion, improve roadway safety, and maintain roadway quality, including the federally required Performance-Based Planning and Programming Process and Congestion Management Process in Chapter 8 and in the Safety and Operations and Management sections of this chapter.

Visualize the Future

People, roadways, and vehicles may become more connected and safer through ongoing planning, investment, land use coordination and transportation system technologies including the connectivity of vehicles and transportation infrastructure and increased vehicle automation. Learn more about how TPB is preparing for the uncertainty around potential benefits and challenges of these technologies in the Emerging Technologies and Operations section of this chapter.

The sponsors for the projects in the constrained element identified 243 projects that promote, enhance, or support improved travel for people that drive or ride in vehicles to get around and 74 projects that support the movement of high-occupancy vehicles. The sponsors identified 32 of the projects in the constrained element as implementing the Aspirational Initiative "Expand the Express Highway Network" which promotes transit and carpooling or vanpooling with 3+ to ride free on expressways.
See the complete responses for all project at visualize2045.org/plan-update.

Example projects in the constrained element that support vehicle travel include the I-295/Malcolm X Interchange Project (T5723) that will improve access to major employment centers (US Department of Homeland Security, Joint Base Anacostia-Bolling) and improve safety for motorists. Also, the US 15 Corridor project (CE3567) north of the City of Frederick, located within the more rural portion of Frederick County, MD, will serve a population with a lower income level, reduced access to medical care and, in some cases, less access to transportation. Improving the network will help those living locally to have a safe and reliable transportation system that is essential to travel to and from work.

In Virginia, the construction of a new interchange on I-70 (CE2250) in Fairfax County will open the area to new development allowing those that live locally to have job opportunities close to home and a safe and reliable transportation system. The Franconia-Springfield Parkway (CE1833) will improve a heavily utilized route to the Franconia-Springfield Transit Center that is used by buses and personal vehicles. This project will also contribute to the development of an interconnected transportation system that enhances quality of life and promotes a strong and growing economy in Fairfax County and throughout the entire region. In Prince William County, the project to widen Route 28 (CE3219) supports a local Small Area Plan to advance the Aspirational Initiative to "Bring Jobs and Housing Closer Together" and supports future regional plans for BRT or enhanced transit services on the corridor.

Ongoing Challenges

As the region plans for another forecasted 1.3 million people and nearly 1 million jobs in the region by 2045, there is a need to improve the efficiency of the available roadway system since there are limited options for expansion. As TPB policy priorities focus on Transportation Demand Management strategies, as documented in the CMP, the region's transportation agencies will need to invest and plan for roadways that support travel by people walking, biking, taking transit, and driving. Roads will need to accommodate the freight movement necessary for the livelihood of the region's communities. Roads will need to provide access and mobility to all people. They will need to be resilient and reliable to serve the additional transportation demand and challenges that may come with increases in extreme weather.

The Policy Context

Impact of the Aspirational Initiatives

Expansion of the express travel network would provide several benefits for people driving or riding in vehicles, including reducing congestion and incentivizing travelers to either carpool or travel by transit vehicle.

Planning Factors

- Increase the safety of the transportation system for motorized and nonmotorized users.

RTPP Goals

- Maximize operational effectiveness and safety of the transportation system.
- Provide a comprehensive range of transportation options.
- Support inter-regional and international travel and commerce.


Prince William County

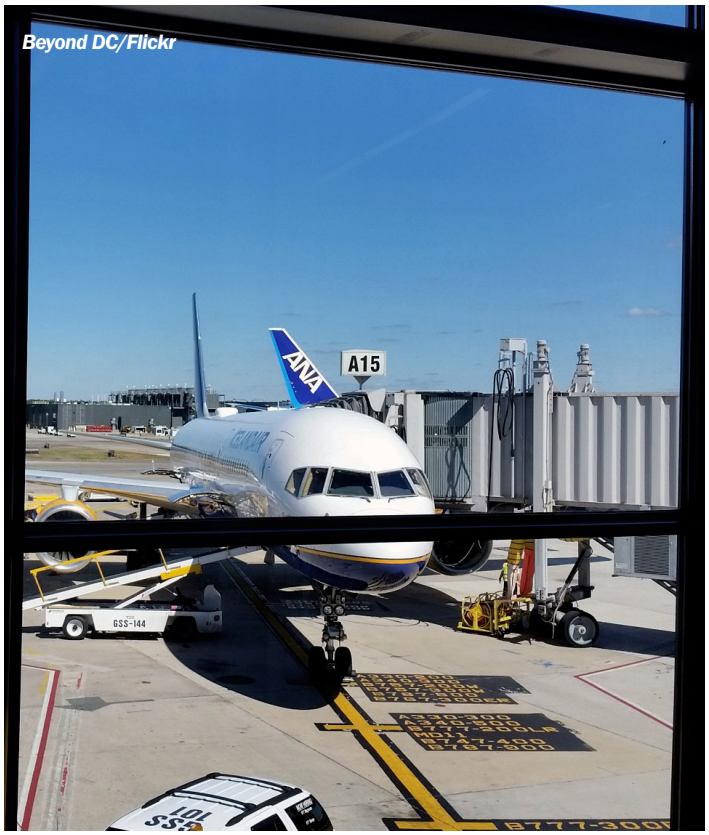
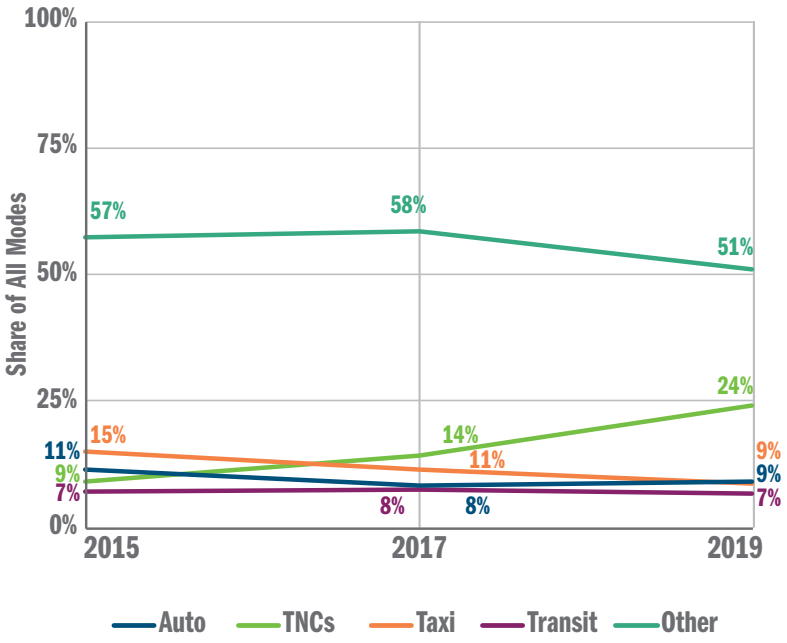


Figure 6.1: Mode of Access to Airport for Departing Passengers, 2015, 2017, 2019 (Source: Regional Air Passenger Survey, TPB Continuous Airport Systems Planning)



Airport Systems Planning

In a typical year, more than 37 million people and 400,000 tons of freight cargo pass through the region's three major airports: Ronald Reagan Washington National (DCA), Washington Dulles International (IAD), and Baltimore-Washington International Thurgood Marshall (BWI). In all, the airports directly or indirectly support more than 450,000 jobs and some $50 billion in annual economic activity. Due to the COVID-19 pandemic, the region experienced a 65-percent decline in the number of people traveling through DCA, IAD, and BWI—down from 37 million in 2019 to 13 million air passengers in 2020. The TPB Aviation Technical Subcommittee and associated TPB staff continue to monitor the impacts that COVID has had on the industry.

Through its Continuous Airport Systems Planning (CASP) program, the TPB supports the planning, development, and operation of airport facilities and the transportation facilities that serve the airports in a systematic framework for the region. This work includes monitoring local air travel patterns, forecasting future air passenger and air cargo needs, and developing plans for improving how people and goods get to and from the region's airports, including the anticipated completion of the Silver Line.

Equity Considerations

A region with equitable and resilient air systems is one that is logistically and financially accessible to all individuals who must reach the airport in a timely fashion, including airport workers. Many airport workers do not earn incomes that enable them to own a private vehicle and are thus reliant on the current public transit system, which has geographic as well as schedule-related limitations for these individuals reaching their place of work in a safe, timely, and affordable manner.

TPB's Role

The CASP program is developed, implemented, and monitored under the oversight of the Aviation

Technical Subcommittee, which is responsible for coordinating airport system planning with the regional transportation planning process. The airport system planning process begins with a regional air passenger survey and is followed by forecasts of future air passenger travel and the ground travel of these air passengers to and from the airports. These forecasts, in turn, influence the Regional Airport System Plan update. Figure 6.1 shows some of the information that the TPB gathers on ground travel to the region's airports. **More information about the airport system planning process can be found at mwcog.org/CASP**.

Visualize the Future

The sponsors for the projects in the constrained element identified 24 projects that promote, enhance, or support air passenger travel. According to the Federal Aviation Administration (FAA) 2019 Passenger Boarding data and 2045 Terminal Area Forecasts, overall enplanement (boarding air passengers) at BWI, DCA, and IAD are projected to increase by 46 percent between 2019 and 2045. 2019 was selected as the base year in this calculation because it represents pre-pandemic conditions. When considering the significant decreases in enplanements resulting from the pandemic during 2020, enplanements at all three airports would increase 317 percent between 2020 and 2045 due to the unusually low base year number.[29] As the region's airports continue to recover from the COVID-19 air travel downturn, the TPB's airport systems planning and coordination efforts will continue to make access to air travel easier for air passengers, airport employees, and freight shippers alike. One significant change will be the upcoming expansion of Metrorail's Silver Line beyond Dulles Airport.

Ongoing Challenges

The COVID-19 pandemic is a global aviation industry challenge. The recovery process continues to be monitored by TPB staff and communicated to TPB member jurisdictions and other key stakeholders who are deeply invested in the recovery of the economic engine of the region's commercial airports. Additionally, the advancement of technological disruptors, such as connected and automated vehicles, flying taxis (such as Uber Elevate), and unmanned aerial vehicles (e.g., drones) continue be factored into long term regional airport systems ground access planning efforts. Finally, with the forthcoming expansion of Metrorail's Silver Line to Dulles Airport, upcoming air passenger surveys must be designed in a way to accurately measure the impact of the Metrorail extension.

The Policy Context

Impact of the Aspirational Initiatives

The express travel network would provide several benefits for airport ground access connectivity, including reducing congestion and incentivizing travelers to either carpool or travel by transit vehicle.

Expanding Metrorail capacity would increase logistical ease and comfort for those traveling by Metrorail to and from airports.

Planning Factors

- Enhance travel and tourism.
- Increase accessibility and mobility of people.
- Increase accessibility and mobility of freight.

RTPP Goals

- Provide a comprehensive range of transportation options.
- Support inter-regional and international travel and commerce.

29 Base Year; Source: FAA, Enplanements at all Commercial Service Airports, Calendar Year 2019 Passenger Boarding Data (Final) faa.gov/airports/planning_capacity/passenger_allcargo_stats/passenger/media/cy19-commercial-service-enplanements.pdf. Forecast Year: Source: FAA Terminal Area Forecasts, faa.gov/data_research/aviation/taf/media/TAFSummaryFY2020-2045.pdf

Strategies to Address Future and Planning Factors

Mike Maguire/Flickr

Equity and Inclusion:

The TPB has been long committed to ensuring transportation-disadvantaged populations are actively included in the planning process. The TPB works to meet and exceed federal requirements by first engaging these populations on regional issues, and secondly, evaluating the financially constrained element of Visualize 2045 for disproportionately high and adverse impacts on low-income and minority populations. The TPB proactively ensures that people with limited English skills and those with disabilities can fully participate in and benefit from TPB-related work.

TPB's Role

In 2020, the TPB approved a resolution reestablishing its commitment to equity and anti-racism. The TPB's equity resolution affirms that equity, as a foundational principle, will be woven throughout TPB's analyses, operations, procurement, programs, and priorities. As such, this chapter's discussion of strategies now includes a discussion of equity considerations and planning activities.

In 2017, the TPB adopted "Equity Emphasis Areas" (EEAs, Figure 6.2) as a tool to examine demographic patterns in the region and to analyze Visualize 2045 (2018) for disproportionate and adverse impacts on historically disadvantaged populations. EEAs are small geographic areas that have concentrations of low-income and/or minority populations based on Census data. More information including an online interactive map of the EEAs helps inform the region about spatial patterns for various population groups: **mwcog.org/EEAs**.

The TPB uses EEAs to analyze the financially constrained element of Visualize 2045 by looking at the forecasted performance of the transportation system for the year 2045, comparing accessibility and mobility measures for the EEAs versus the rest of the region. The EEAs are also used as a tool in other COG and TPB planning activities. The data have been made available to local jurisdictions to assist them in considering equity in initiatives, such as housing, education, health care, and parks. The EEAs are a criteria for selection of projects that receive TPB programmatic funding.

The TPB also has a proactive public involvement process to ensure the concerns of historically disadvantaged populations are being heard. Through the Voices of the Region public engagement, the TPB expanded its public opinion and outreach efforts to inform this plan and other regional planning activities. Chapter 5 describes this process, including the important role that the Access for All Advisory Committee plays, advising the TPB on transportation issues, programs, policies, and services important to traditionally underserved communities. Appendix H provides a deeper discussion on these topics. The regional makeup of these communities can be seen in Figure 6.3. Finally, COG's Title VI Plan provides necessary policies and practices to ensure non-discrimination, and is available at **online**.

Figure 6.2: Equity Emphasis Areas

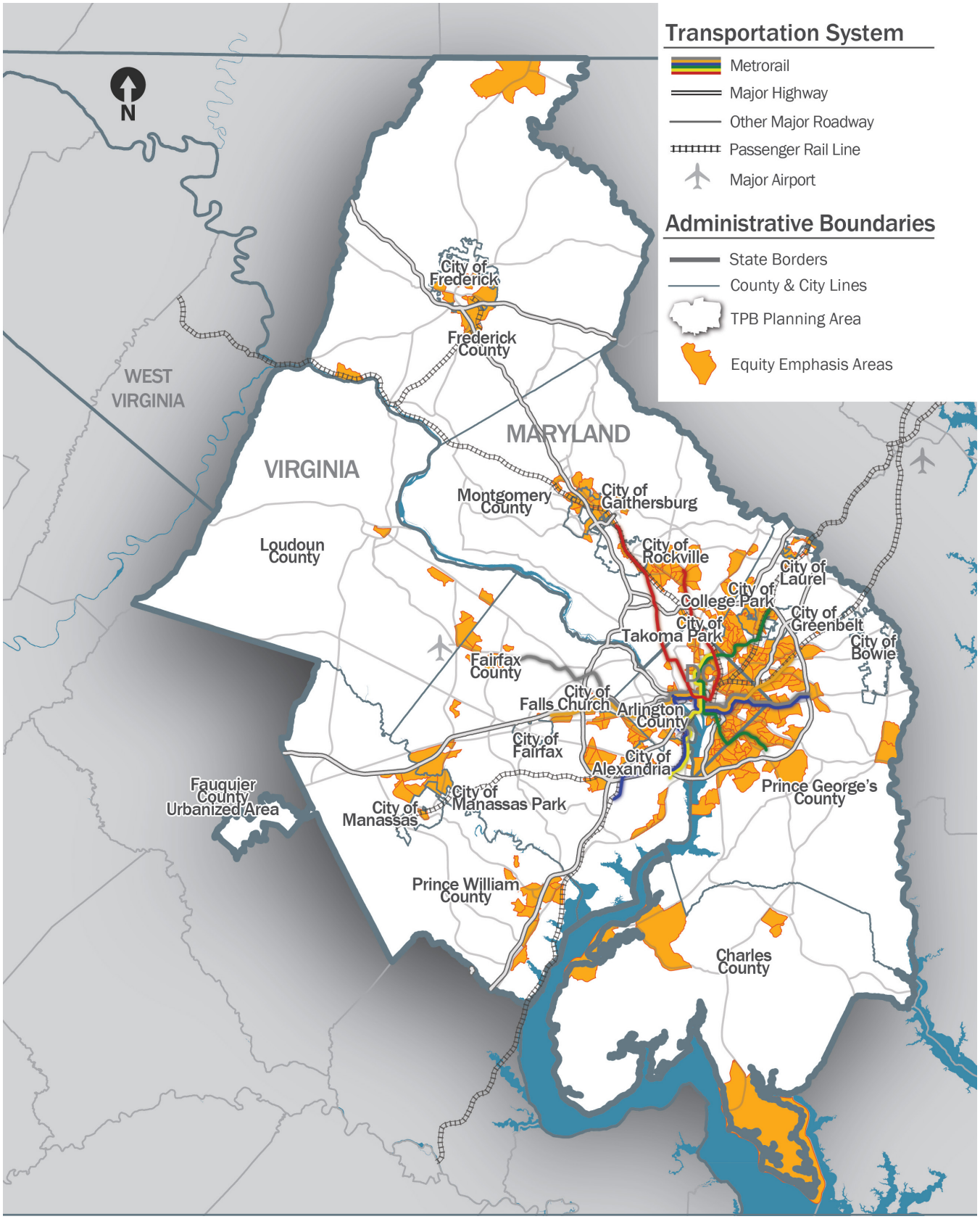
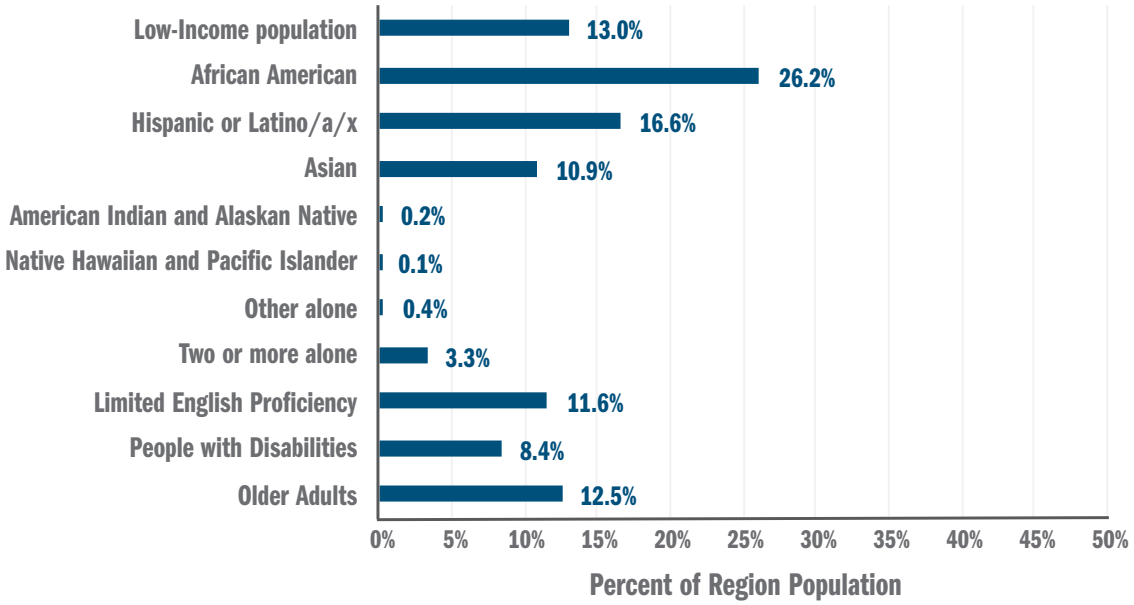


Figure 6.3: Regional Demographic Profile of Transportation — Disadvantaged Populations in the Washington Region, 2019 (Source: 2015 – 2019 U.S. Census American Community Survey)



Voices of the Region

LOW-INCOME PERSPECTIVE

Respondents with low-income who commute were significantly more likely to walk to work or school during the pandemic, relative to non-low-income respondents. They were also significantly less likely to telecommute. Respondents with low income were significantly more likely to ride the bus if the stops or stations were cleaner, the buses were less crowded, and the fare was cheaper.

"In terms of addressing equity, frankly because I have a place of privilege I don't have an equity concern for myself, but the reality is that there are too many resources going to people like me and where I live and not enough going to places that are heavily bus-dependent, or heavily transportation-dependent, or even for drivers."

— Resident of Montgomery County, MD

Visualize the Future

The TPB looks to have the region's future transportation system function in a way that is fair, equitable, and has addressed the wrongs of the past. While equity may mean something different to each individual, all people should feel safe and have a comprehensive range of affordable options to get where they need to go. The TPB will continue to view all its work through an equity lens and support its members in doing the same by providing policy guidance, tools, and data to support decision-making.

Building on the Environmental Justice analysis that is conducted after the completion of each plan, as part of the solicitation of technical inputs for this plan, the TPB asked project sponsors several questions about if the projects serve EEAs and how they consider issues of equity. Project sponsors indicated that 109 projects in the constrained element of this plan are in EEAs, and 129 projects

The Policy Context

Impact of the Aspirational Initiatives

Together, the initiatives would provide more transportation options in the region improving affordable transportation access to jobs and other life destinations. The EEAs may be used by state and local agencies, at their discretion, to consider equity in any of the initiatives and are a criteria considered in the prioritization of TAFA and other grants that implement the access to transit initiative. When complete, the NCTN will serve 308 of the 351 EEAs. Optimizing land-use to "Bring Jobs and Housing Closer Together" could improve accessibility for people living in the EEAs.

Planning Factors

- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.

RTPP Goals

- Promote a strong regional economy, including a healthy regional core and dynamic Activity Centers.
- Enhance environmental quality and protect natural and cultural resources.

connect an EEA to a regional Activity Center. These projects should help improve the transportation options in EEAs for people that live in and near them, and help people move among EEAs and regional Activity Centers, where there are higher concentration of jobs and other life destinations.

The TPB also asked project sponsors to provide responses as to how each existing and new project further supports or advances equity as described by the TPB July 2020 resolution.

For example, The project to create an Overpass of I-495 at Tysons Corner Center (CE3157) is in an Activity Center and is near an EEA. The project improves connectivity and accessibility to transit for people with low income and minority populations. The proposed improvements for the US 301 Corridor in Waldorf (CE2239) including a grade-separation at MD 5, would support the connection of an EEA with various activity and employment centers in Waldorf, Charles County, and throughout the metropolitan Washington area.

To see a total of all projects that serve or are in EEAs, see Chapter 7. **Retrieve the full policy documentation with responses and narratives for each project on the Visualize 2045 website.**

Ongoing Challenges

Making a real difference in people's lives to improve equity in the region and righting wrongs of the past is not an easy objective; it requires concerted action across numerous disciplines, jurisdictions, and agencies. Also, in a dynamic and growing region such as the metropolitan Washington area, demographics shift and change, often quickly, and it's a challenge to keep demographic data up to date. This makes analyzing the future impact of the financially constrained element of Visualize 2045 on transportation-disadvantaged populations even more challenging. Forecasting the impacts of the projects in the constrained element on these populations in the future is an inexact science. The TPB is committed to using the most current methods of analysis, the latest demographic data, and public engagement methods to help inform the region about the transportation needs of all population groups, and to creating a fair, accessible, and inclusive transportation system.

Coordinated Human Transportation Services Plan

TPB and COG strive to improve mobility for persons with disabilities, older adults, and other transportation-disadvantaged populations. The TPB is the designated recipient of the Federal Transit Administration's (FTA) Enhanced Mobility of Seniors and Individuals with Disabilities program administered by COG. Under the guidance of its federally required Coordinated Human Transportation Services Plan (Coordinated Plan), the matching grant program funds projects seeking to improve access to transportation for older adults and people with disabilities. The plan was last updated in 2018 and is being updated in 2022.

Equity Considerations

As expressed by members of the Access for All Advisory Committee and recorded in the Coordinated Plan, older adults and persons with disabilities experience transportation challenges not shared by the general public. The principles of the Coordinated Plan, including the right to mobility, customer focus, elimination of service gaps, and maximizing efficiency of service delivery, aim to guide the TPB's work toward increasing equity for these traditionally disadvantaged population groups. Further, using Equity Emphasis Areas, consideration of low-income and racial and ethnic populations is embedded in the Enhanced Mobility Program's project selection criteria.

TPB's Role

The Coordinated Plan highlights unmet transportation needs for people with disabilities and older adults, identifying strategies to meet those needs. These needs encompass accessibility, availability, affordability, and awareness of mobility options. The Coordinated Plan includes priority projects that can help the region better serve targeted groups. This information and identified priority projects inform the selection process for Enhanced Mobility program grant funding. The TPB's Access for All Advisory Committee provides input and participates in the development of the Coordinated Plan.

Since 2014, the TPB has conducted four Enhanced Mobility solicitations and awarded more than 92 projects totaling over $34 million. These grants give more options to people who would otherwise have limited mobility. **More information on the Coordinated Plan and Enhanced Mobility can be found here**.

Visualize the Future

The TPB's Human Service Transportation Coordination work moves the region toward a more inclusive transportation system and true "access for all." While the unmet needs for transportation-disadvantaged populations are broad and wide-ranging, the Coordinated Plan helps inform the region about current conditions

and can guide discussions about future transportation opportunities. In some cases, technological advancements in mobility help address the needs of transportation-disadvantaged populations.

A few examples of projects that the TPB funded in 2022 include: a project to continue and expand the Fairfax Mobility Access Project (FXMAP) which seeks to enhance awareness of transportation programs and develop training programs to teach how to use them, develop and implement new transportation options, and coordinate services. Another example is funding for two replacement buses and associated operating expenses for transportation to and from Easterseals' Adult Medical Day program that provides activities, socialization, nutritious meals, management of chronic conditions, and clinical oversight for older adults and adults with disabilities in Prince George's and Montgomery Counties. TPB also funded two wheelchair accessible minivans and two 15-passenger buses, and associated operating expenses, for the Arc of Greater Prince William/INSIGHT, Inc, to be used to transport adults with developmental disabilities to and from employment, mobile work training groups, adult day program sites, medical appointments, and community integration activities.

Ongoing Challenges

A variety of transportation options and strategies are needed to meet the wide-ranging challenges faced by older adults, people with disabilities, and those with limited incomes. As the region's population continues to age, addressing the unique mobility needs of older drivers may include helping them transition from driving to other modes of transportation and communicating the various mobility options available to them.

Also important is ensuring that people with disabilities can use pedestrian infrastructure, public transit, and tailored transportation options such as door-to-door services. Inclusive planning involves having continued discussions with community groups and transportation-disadvantaged populations. Engaging them can help optimize app-based services and CAV in a way that is more universally accessible and contribute to planning where technology can help address the unique mobility challenges of older adults and people with disabilities. The TPB staff have presented on CAV topics to the AFA to get their insights on opportunities and challenges and have used the committee feedback to inform the CAV principles.

The Policy Context

Impact of the Aspirational Initiatives

The transit-focused initiatives that promote transit access, BRT, and Metro could help address the unmet transportation needs of people with disabilities and older adults.

Optimizing the region's land-use and building more housing in Activity Centers would provide more easily accessible services for transportation-disadvantaged populations.

Planning Factors

- Increase the accessibility and mobility of people and freight.
- Increase the safety of the transportation system for motorized and nonmotorized users.

RTPP Goals

- Provide a comprehensive range of transportation options.
- Maximize operational effectiveness and safety of the transportation system.

John M/Flickr

WORKING TOGETHER

Our region is working together to mitigate climate change and prepare our transportation system to be resilient to changes in climate.

Climate Change Mitigation and Resiliency

Weather is the current state of the atmosphere in an area, climate is the long-term weather pattern. Climate change refers to long-term changes to the climate due to global warming. Climate change is real, largely caused by human activity, and is having a noticeable impact on the natural and built environment globally, including warming the atmosphere, ocean, and land. The changes are being driven by greenhouse gases (GHG) (e.g., carbon dioxide, methane, nitrous oxide) that are emitted from various activities, including the burning of fossil fuels.

Climate change impacts transportation infrastructure and services by increasing the intensity, frequency, and duration of extreme weather, which can mean more fallen trees, flooding, and damage to roads, rail, and other infrastructure. Impacts on transportation infrastructure could disrupt service, such as flooding interrupting bus routing and timing, or affect state of good repair due to increased frequency of extreme weather.

To prevent severe climate change globally, the region needs to do its part to substantially reduce GHG emissions (climate change mitigation) and prepare for the effects of climate change (resiliency/adaptation). In 2008, the COG Board adopted regional GHG reduction goals for 2012 (10 percent below a "business as usual" forecast), 2020 (20 percent below 2005 levels), and 2050 (80 percent below 2005 levels) for the metropolitan Washington region. In 2020, the COG Board adopted an interim GHG reduction goal for 2030 (50 percent below 2005 levels). The various sectors contributing GHGs include built environment (residential and commercial building energy), transportation, agriculture, and waste (water and solid). The transportation sector includes both on-road transportation (e.g., cars, trucks, buses) and nonroad transportation (e.g., marine vessels, aviation, rail, and off-road vehicles, such as farm and construction vehicles). In 2020 COG developed a Climate and Energy Action Plan (CEAP) that examined a set of actions in various sectors, which if implemented, could reduce the region's GHG by 50 percent below 2005 levels by 2030. The TPB has endorsed both sets of GHG reduction goals.

Mitigating Climate Change

TPB's Role

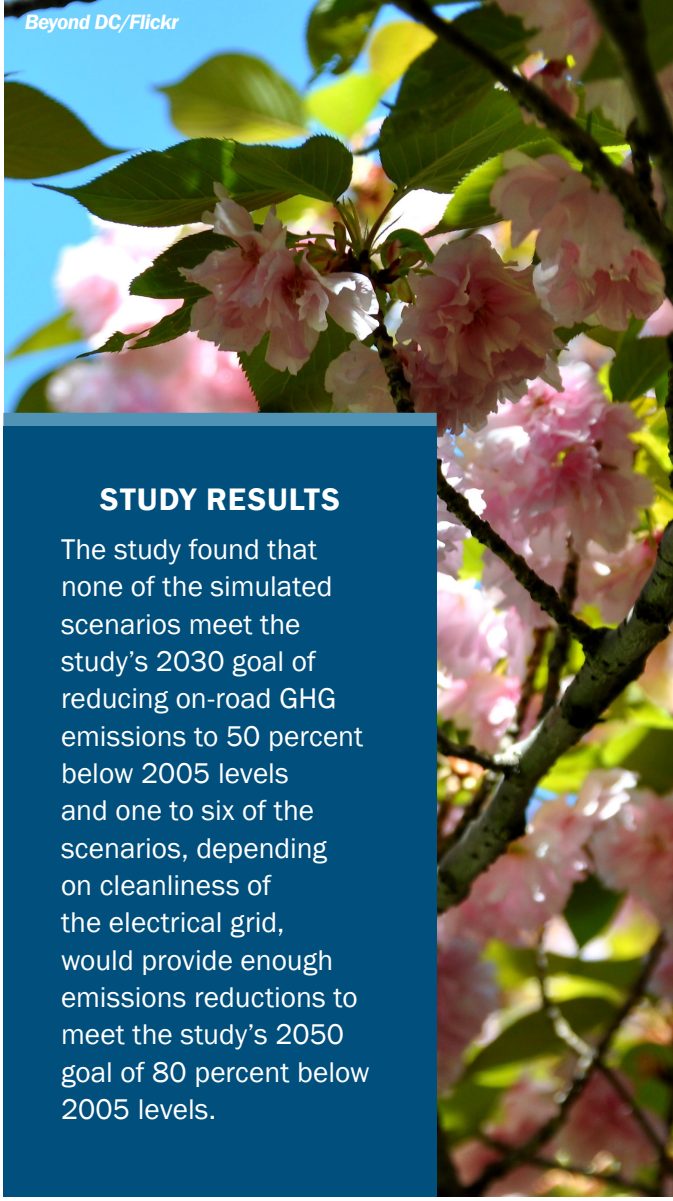
The TPB policy framework has long included goals regarding protecting the natural environment. The TPB takes action to respond to all of its goals, including conducting studies to identify the most effective strategies that members can incorporate into planning activities. Recent studies have focused on safety, transit equity, and climate mitigation and resiliency.

COG and the TPB have worked extensively with their member agencies and partners on approaches to mitigate climate change and prepare the region for impacts of climate change. Since 2010, the TPB has estimated the changes in on-road GHG emissions due to motor vehicles using the roads in its LRTP. For the 2018 LRTP, by 2045, GHG emissions were forecasted to be 23 percent below 2005 emissions levels, or 16 percent below 2018 emissions levels. The TPB has conducted several studies to explore specific strategies that could reduce on-road GHG emissions. Learn more **online** or in Appendix M that summarizes the 2021 study.

Climate Change Mitigation Study (CCMS) of 2021

While the regional GHG goals are multi-sector and not sector-specific, the TPB recognizes that on-road transportation contributes a large share of regional GHG emissions, over 30 percent. The TPB has long sought to reduce GHG emissions from on-road transportation sector. To this end, and to respond to the TPB's endorsement of the region's interim 2030 GHG reduction goal, the TPB undertook the CCMS.

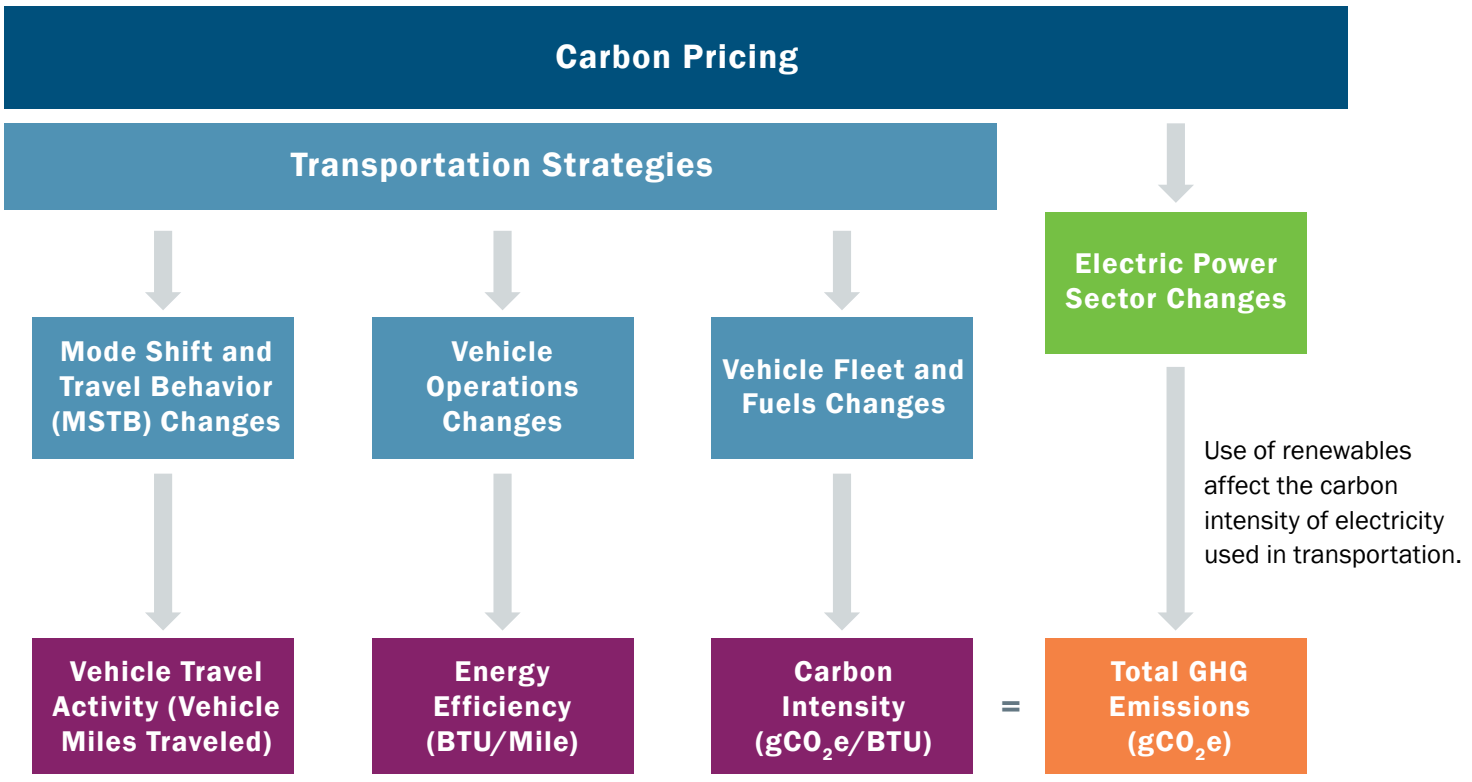
The study sought to answer the question "What would it take to reduce on-road transportation-sector GHG emissions by 50 percent by 2030 and by 80 percent by 2050, compared to the 2005 level?" by conducting a scenario analysis that estimated the GHG impacts of numerous on-road transportation strategies and combinations of strategies. Figure 6.4 illustrates the ways in which transportation strategies impact on-road transportation GHG emissions, coming from motor vehicles. This study defines on-road transportation GHG emissions as emissions coming directly from motor vehicles, including tailpipe and evaporative emissions plus emissions from electricity associated with the use of zero-emission vehicles (ZEVs), such as electric vehicles (EVs). This study did not explicitly analyze carbon pricing but recognized it might support other strategies.


Beyond DC/Flickr

STUDY RESULTS

The study found that none of the simulated scenarios meet the study's 2030 goal of reducing on-road GHG emissions to 50 percent below 2005 levels and one to six of the scenarios, depending on cleanliness of the electrical grid, would provide enough emissions reductions to meet the study's 2050 goal of 80 percent below 2005 levels.

Figure 6.4: Strategies and Pathways for Reducing GHG Emissions from Transportation



Scenarios

After a review of past TPB and COG studies and an extensive literature review, the study team developed a set of scenarios for analysis. The scenarios were examined to understand which actions would significantly reduce GHG in the transportation sector, without regard to whether the strategies were within the TPB's purview, and without regard to cost, politically feasibility, or public acceptance.

The scenarios explored in this analysis included a broad array of strategies under **three primary pathways** for reducing GHGs from on-road transportation sources:

1. **Vehicle Technologies and Fuels:** Strategies to shift the fleet of motor vehicles to electric vehicles (EVs) and increase the share of lower carbon fuels (e.g., biofuels).
2. **Mode Shift and Travel Behavior (MSTB):** Strategies to reduce auto vehicle travel, typically measured by vehicle miles of travel (VMT), by shifting travel from driving alone to more efficient modes, such as transit, ridesharing, bicycling, and walking; reducing auto vehicle trip lengths, such as through land-use strategies; or reducing trip-making entirely, such as through telework.
3. **Transportation Systems Management and Operations (TSMO):** Strategies to optimize the efficiency of travel by reducing vehicle travel delay and/or encourage more eco-friendly driving patterns (such as avoiding excessive breaking and acceleration).

The study also considered three different scenarios for how the electric grid could be powered, including a carbon-free grid scenario.

Voices of the Region

A FEW KEY SURVEY RESULTS:

When asked what improvements would make a person more likely to walk, bike or take an e-powered or mobility device to the train station or bus stop, more than 6% of respondents said a more shaded route to the bus stop or station. That increased to 13% for respondents under 30.

Key Findings

Achieving the TPB study's goals of a 50 percent reduction in on-road GHG emissions (from the 2005 level) by 2030 is extremely ambitious, and none of the scenarios were estimated to achieve this goal. Less than a decade away, there is very little time to get to the level of vehicle technology adoption and VMT reduction required to meet this goal. On-road transportation, however, can contribute substantial GHG reductions to help support the region's GHG reduction goals. Already, the TPB's system performance analysis shows that while VMT is increasing, per capita VMT and GHG are decreasing, due to how people travel, vehicle technologies, and fuel efficiency improvements.

Several scenarios (generally those with a combination of strategies) achieved the level of on-road GHG reductions assumed in the technical analysis that supported COG's 2030 CEAP, which demonstrated that the region could meet the overall 2030 goal. In 2050, with the reference case electrical grid, the analysis showed that the 2050 goal is met with only the most aggressive scenario. Under assumptions about a cleaner electrical grid, four to six of the ten scenarios were able to achieve the 2050 goal. Achieving an 80 percent reduction in on-road GHG emissions (from the 2005 level) by 2050 is possible with vehicle technology advancements and a clean electrical grid. Mode shift and travel behavior strategies support GHG reductions but are less impactful for GHG reductions when nearly all on-road vehicles are EVs, and the electrical grid is carbon neutral.

Bossi/Flickr

Types of Analysis

This study involved two different types of analysis:

ANALYSIS 1:

- Three "top-down" scenarios were developed and analyzed to identify by how much vehicle miles traveled (VMT) would need to be reduced, or what level of ZEV adoption would be needed, to meet the 50 percent and 80 percent reduction goals by 2030 and 2050, respectively.

ANALYSIS 2:

- Ten "bottom-up" scenarios were developed to assess how much GHG reduction might be expected with implementation of different sets of strategies to determine which scenarios could meet the 2030 and 2050 GHG reduction goals. (See the CCMS report for details.)

Elvert Barnes/Flickr

2022 TPB Greenhouse Gas Reduction Goals and Strategies

At its June 2022 meeting, the TPB adopted **Resolution R18-2022** detailing new GHG reduction goals and strategies specific to the on-road transportation sector, as detailed below. This decision was informed in part by TPB and COG climate work, the findings of the TPB Climate Change Mitigation Study of 2021, TPB member considerations of the feasibility of each strategy, a TPB member survey, and discussions during two climate change mitigation work sessions in 2022.

Goals

The TPB adopted regional, voluntary, on-road transportation-sector-specific goals to reduce GHG emissions 50% below 2005 levels by 2030 and 80% below 2005 levels by 2050. These goal levels are numerically identical to the regional, non-sector-specific goals, and are also more aggressive than the contributions that had been assumed from the on-road transportation sector in COG's 2030 Climate and Energy Action Plan.

Strategies to Implement

The TPB adopted seven greenhouse gas reduction strategies that have the potential to reduce on-road transportation GHG emissions:

- Improve walk/bike access to all TPB identified high-capacity transit stations.
- Increase walk/bike modes of travel - Complete the TPB's National Capital Trail Network by 2030.
- Convert private and public sector light, medium and heavy-duty vehicles, and public transit buses to clean fuels by 2030.
- Deploy a region-wide robust electric vehicle charging network (or refueling stations for alternate fuels).
- Add additional housing units near TPB-identified high-capacity transit stations and in COG's Regional Activity Centers.
- Reduce travel times on all public transportation bus services.
- Implement transportation system management and operations (TSMO) improvement measures at all eligible locations by 2030.

Strategies to Explore

The TPB identified seven other greenhouse gas reduction strategies, also focused on on-road GHG emissions, which merit further discussion and study, so that they may be considered for possible future inclusion into the region's planning priorities:

- Take action to shift growth in jobs and housing from locations currently forecast to locations near TPB-identified high-capacity transit stations and in COG's Regional Activity Centers to improve the jobs-housing balance locally.
- Make all public bus transportation in the region fare-free by 2030.
- Make all public rail transportation in the region fare-free by 2030.
- Price workplace parking for employees – only in Activity Centers by 2030 and everywhere by 2050.
- Convert a higher proportion of daily work trips to telework by 2030 and beyond.
- Charge a new fee per vehicle mile of travel (VMT) by motorized, private, passenger vehicles in addition to the prevailing transportation fees and fuel taxes.
- Charge a "cordon fee," per motorized vehicle trip for all vehicles entering Activity Centers by 2030.

Impacts of the CCMS on Regional Planning and Strategy Implementation Considerations

The strategies in the scenarios were not limited to strategies within the TPB's purview, and were developed without regard to cost, politically feasibility, and public acceptance. To mitigate climate change, action and cooperation will be required all levels of government—local, state, and federal. Mitigation also will also require actions by the private sector and the public.

Additionally, the study also did not examine strategies for their interrelationships with other sectors. For example, telework could reduce personal vehicle trips, VMT, and associated GHG; but it could possibly increase GHGs from energy use, depending on energy source, when people work from home across the region as they would use additional lights, and heating and cooling of homes. Many strategies across sectors will need to be implemented together to see significant progress toward the 2030 and 2050 goals.

Implementation actions must consider social and economic effects, such as potential social and economic costs of teleworking, implications on regional competitiveness (positive or negative), and the impacts of costs imposed through pricing strategies (road pricing, parking pricing, fuel taxes, or carbon taxes) on households.

Strategies must also be examined for their potential impacts on transportation revenues and expenditures. For example, reducing transit fares and shifting to EVs would both lead to losses of traditional revenue sources for transportation (transit fares and gas taxes). Additionally, transit enhancements require significant, long-term spending. The funding gap from revenue loss and additional cost from investments would need to be reconciled. Furthermore, agencies would need to identify upfront costs for widespread vehicle electrification and costs associated with incentive programs and policies. Funding would also be needed to cover costs associated with education and awareness programming for each strategy.

Equity Considerations

As the region plans to implement strategies that can reduce GHG from the on-road transportation, there are many implications for equity that need to be considered. Some of these include:

- **Vehicle electrification:** EV planning needs to include strategies to ensure access to EVs and charging infrastructure, which could be difficult for some population segments (medium- and low-income, multifamily residents, renters, and for car-owners that park on-street).
- **Teleworking:** May not be applicable for workers in many service industries. An increase in teleworking could also have potential impacts on service-focused businesses, which often employ low-income workers (e.g., restaurants and other in-person services).
- **Parking pricing, cordon pricing, and VMT fees:** Costs can disproportionately affect low-income households and may be regressive. Fees can be designed with equity in mind, accounting for factors such as household income (e.g., credits for low-income households), and use of funds for transit and equity-focused services.

Voices of the Region

A FEW KEY SURVEY RESULTS:

Residents in the region are concerned about climate change and transportation.

The "Voices of the Region" survey found that 84% of residents agree that elected officials need to consider the impacts of climate change when planning for transportation in the future, with 72% strongly agreeing with the statement. People under 30 years of age especially agreed (92% somewhat or strongly agreeing) that elected officials should consider climate change impacts in planning.

Photo by Amanda Farber

Planning for a Resilient Region

Disruptions to the region's transportation system can have many causes, one is natural hazards, such as severe storms. The past decade has seen an uptick the intensity, frequency, and duration of these natural hazards as the climate has begun to change. In our region, some of the hazards include extreme heat or cold, extreme storm events, and flooding of all kinds: coastal flooding, flooding from rivers and streams, and flash floods that can occur away from bodies of water.

Metropolitan Washington has long dealt with these natural hazards, but recent trends due to climate change are making it more crucial for the region's leaders to plan for resilience. As the region's population and infrastructure investments grow, these hazards pose risks to our people, environment, and economy. Congress has recognized this need nationwide, adding resilience and stormwater as factors that transportation agencies must consider when planning.

TPB's Role

The TPB endorsed the COG resilience goal of "becoming a Climate Ready Region and making significant progress to be a Climate Resilient Region by 2030." It also confirmed need to incorporate equity principles and expand education on climate change into its members' actions to reach climate mitigation and resiliency goals.

In 2021, the TPB conducted a **study to support regional planning for resilience** and implementation of resilience actions items documented in the COG 2030 Climate and Energy and Action Plan. The study is summarized in Appendix L. While the term "resilience" can have many applications, the study used the federal transportation agencies' definition "the ability to anticipate, prepare for, and adapt to changing conditions and withstand, respond to, and recover rapidly from disruptions."

The study included a point-in-time **inventory of resiliency activities** underway in the region to document the many ways in which the region's agencies are planning for transportation resiliency. These include, but are not limited to setting goals, conducting analysis, developing strategic plans, adding specialized staff and updating project selection criteria to consider resilience. The study resulted in a **report** that synthesizes the research findings, documents regional vulnerabilities to natural hazards, discusses strategies for resilience, addresses equity in resiliency planning and the identifies potential TPB roles in future resilience planning efforts.

The TPB coordinates with other sectors when planning for a resilient future. For example, improving the region's tree cover can help mitigate impacts of localized transportation pollution, lessen the "heat island" effect and related health impacts of long-term exposure to air pollution, and enhance the overall quality of life for residents. COG's Department of Environmental Planning is actively engaged in advancing policies and solutions to stabilize and improve the region's tree canopy and land cover. The COG Regional Tree Canopy Subcommittee, dedicated to the management of the tree and forest canopy in the region, published in 2018 a **Tree Canopy Management Strategy**, a framework of policies and recommendations that can be used to address challenges and threats to urban forests.

Equity Considerations

Planning for resiliency is not just a technical analysis activity but one with real-world implications and consequences for the region's residents. The TPB is working to understand the potential equity impacts of natural hazard risks and how agencies can take action.

Natural hazards impact people and communities differently, and many traditionally marginalized populations may be particularly vulnerable to the impacts, such as:

- **Greater exposure:** Extreme heat impacts are stronger in highly urbanized areas with abundant pavement and little green space, known as the urban heat island effect. The effect tends to be highest in neighborhoods with a lot of rental properties and households earning lower incomes.
- **Higher sensitivity:** Vulnerable populations can include older adults or those with medical conditions that may make them more susceptible to harm during a climate event. For example, these populations are more likely to suffer from heatstroke during a heat wave.
- **Less adaptive capacity:** Underserved communities may lack resources needed to adapt to climate shocks and stressors, such as air conditioning, air filters, or the ability to easily evacuate and relocate if necessary.

Ongoing Challenges

Some strategies that can contribute to climate mitigation and resiliency are unlikely to benefit all; this could precipitate long-established structural equity issues. During the COVID-19 pandemic, some jobs were classified as "essential" including government, health care, grocery store, public works, and others. During the surge of pandemic-fueled teleworking, regional surveying found that only 32 percent of employed individuals that self-identified as "essential workers," could use telecommuting, compared to 81 percent of workers without this classification. "Essential" workers may not have the choice to work from home to limit their carbon footprint or avoid extreme weather in the region.

Also, transit improvements and the regional priority to focus new growth around HCT station areas need be paired with the protection and production of affordable housing located near the stations, the region's core, and Activity Centers to make "green" and reliable travel options available to all people.


Arlington DES/Flickr

Another challenge is funding the necessary improvements to mitigate and prepare for climate change. As about 81 percent of funding must be directed to maintaining and operating the existing transportation system, little funding is available for enhancements. Like it has done to address other goals, such as safety, the region will need to integrate climate mitigation and resiliency considerations into all aspects of planning, programming, project development, and operations to get the most benefit out of every dollar.

Visualize the Future

A resilient transportation system will be one where users of the transportation system have a range of options that help them limit the carbon footprint of travel. As people walk and bike to destinations, including transit stops, the presence of shade provided by tree cover can provide for a cooler trip. In the face of severe weather, communication systems will alert travelers of potential hazards, enabling people to make safe choices about when, where, and how to travel. Planning for the infrastructure and operational systems will enable the system to withstand, respond to, and recover rapidly from disruptions while continuing to serve the travel needs of people traveling in and through the region. Project sponsors identified 185 projects in the constrained element that contribute to the reduction of GHG emissions and 93 projects that contribute to resiliency and stormwater management.

Environmental Consultation and Mitigation

The TPB's environmental consultation and mitigation activities provide resources and opportunities for environmental and historic preservation agencies at the state and local levels to engage in the regional long-range transportation planning process.

Through TPB and COG committees and the public participation process, the TPB conducts a consultation effort during the development of the transportation plan that engages, as appropriate, state and local agencies responsible for land-use management, natural resources, environmental protections, conservation, and historic preservation. The consultation process includes a comparison of the transportation plans with state conservation plans or maps and inventories of natural or historic resources.

The TPB also must include a discussion of possible mitigation activities that may have the greatest potential to restore and maintain environmental functions, (see Appendix G). The areas where mitigation efforts can be focused include neighborhoods and communities, cultural resources; wetlands and water resources; forested and other natural areas; endangered and threatened species; and air quality. State and local transportation agencies examine, document, and implement any needed environmental mitigation actions at the individual project level.

Possible environmental mitigation activities may include avoiding impacts altogether; minimizing a proposed activity/project size or its involvement; rectifying impacts (restoring temporary impacts); employing special features or operational management measures to reduce impacts; and compensating for environmental impacts by providing suitable, replacement or substitute environmental resources of equivalent or greater value, on- or off-site. Some more specific examples of commonly used mitigation activities at the project level in the region include minimizing noise impact with sound barriers, replacing or restoring wetlands, improving stormwater management, replacing or restoring forested areas, and minimizing the idling of heavy construction vehicles.

A new interactive map provides a regional-level resource to inform the relationship between the transportation and environmental concerns: **mwcog.org/EnviroInventoryMap**. The map allows the public and decision-makers to view the natural resource data layers along with the transportation projects expected to be built by 2045 from the financially constrained element of this plan. By defining and inventorying environmental resources and data, the interactive map can be used to inform state and local agencies and the public about the relationship between the projects in the constrained element and environmental concerns at the regional scale.

Ted Eytan/Flickr

Safety Planning

A safe transportation system is a foundational element of a livable region. With approximately 300 deaths and nearly 2,500 serious injuries in crashes every year on the region's roads, improving the safety of all modes is critical to improving the quality of life for residents and visitors. Learn more about safety performance data in Chapter 8, Planning for Performance. The TPB is committed to reducing fatalities and serious injuries on the region's roadways and meeting regional-level transportation safety federal regulations that seek to increase the safety of the transportation system for motorized and nonmotorized users.

Equity Considerations

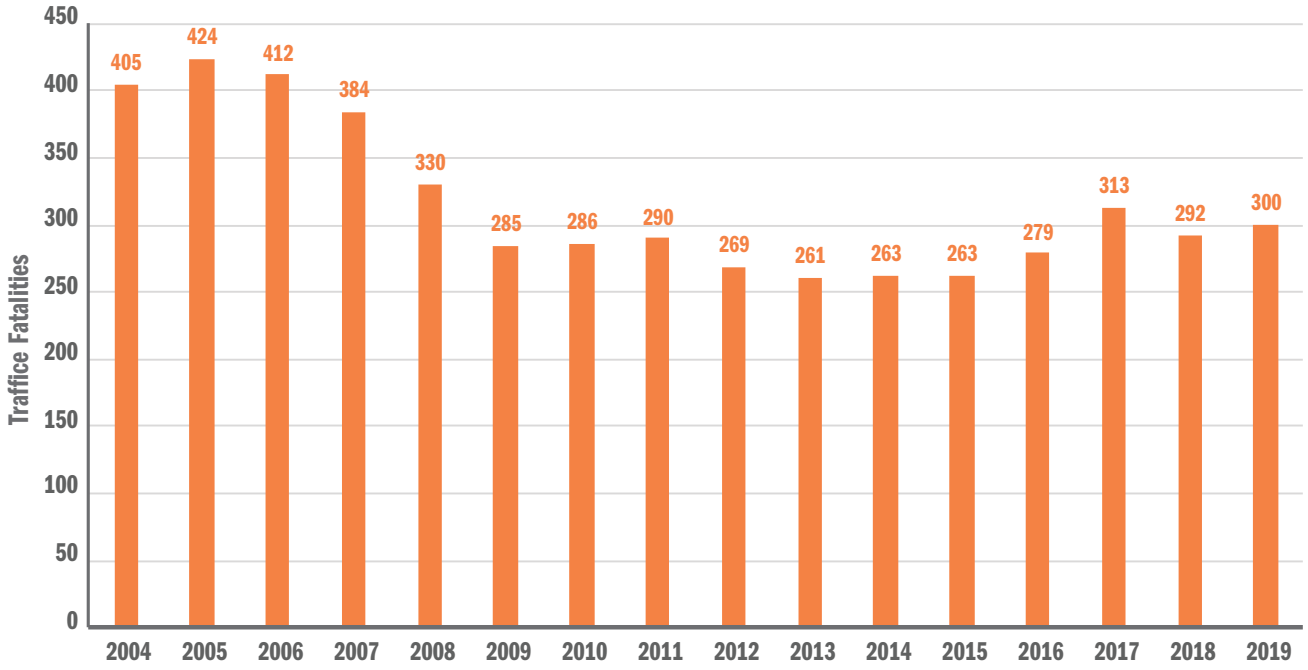
The **Regional Roadway Safety Study**, published in 2020, revealed that while 28 percent of the region's residents live in EEAs, or areas with larger concentrations of minority and low-income populations, over 34 percent of the region's roadway fatalities occur in EEAs. Fatal crashes within EEAs were more likely to occur at intersections, involve pedestrians, and/or involve young drivers than fatal crashes not within EEAs. The TPB is committed to working with its member jurisdictions to develop and implement projects, programs, and policies to equitably improve safety outcomes for all roadway users and has tailored its Regional Roadway Safety Program to prioritize safety investments in EEAs.

TPB's Role

Through the transportation planning process, PBPP, and the public participation process, the TPB ensures safety is considered throughout its programs and plans. Safety is a part of the long-range transportation planning process. It is considered in the projects that go into the financially constrained element of the long-range transportation plan, in PBPP measures and target requirements, and throughout other Visualize 2045 elements. The TPB Voices of the Region focus groups included safety as one of the primary discussion elements to provide insight as to safety concerns from the perspective of people living in the region's communities.

The TPB's Transportation Safety Subcommittee meets regularly to guide ongoing highway safety analysis, identify the most significant highway safety problems,

Figure 6.5: Total Traffic Fatalities in the National Capital Region, 2004 – 2019 (Source: National Highway Traffic Safety Administration, Fatality Analysis Reporting System)



CityofStPete/Flickr

and foster regional coordination. Further, the TPB leads the annual Street Smart Pedestrian and Bicycle Safety campaign to educate drivers, pedestrians, and bicyclists about safe use of the region's roadways.

While fatalities on the region's roadways dropped significantly between 2005 and 2013, they have since risen by nearly 15 percent between 2013 and 2019 (Figure 6.5) and most of that increase is due to greater numbers of bicyclist and pedestrian fatalities.

In 2020, the TPB adopted **Resolution R3-2021** articulating a policy statement on roadway safety and establishing the Regional Roadway Safety Program. This resolution was informed by the results of an in-depth **consultant-led study** commissioned by the TPB to understand the factors behind the unacceptably high number of traffic fatalities and serious injuries on the region's roadways and identify evidence-based strategies to address them.

The Regional Roadway Safety Program, funded at $250,000 for its first two years, provides short-term consultant services to member jurisdictions to assist with planning or engineering projects that address roadway safety issues. Examples include studies as well as planning and design projects that will lead to a reduction in fatal and serious injury crashes. The program provides consultant assistance of up to $60,000 for studies or planning projects, and up to $80,000 for design or preliminary engineering projects.

Visualize the Future

The public depends on regional leaders to improve safety on the transportation network. The TPB and its regional partners are striving to reduce traffic fatalities and serious injuries. The Commonwealth of Virginia supports the Toward Zero Deaths national standard, while the State of Maryland, the District of Columbia, the City of Alexandria, Arlington County, Montgomery County, and Prince George's County have each adopted Vision Zero policies. These programs and policies aim to achieve a roadway system with no traffic-related fatalities or serious injuries.

The sponsors for the projects in the constrained element identified 277 that respond to the federal safety planning factor, and 188 projects that significantly reduce fatalities or injuries among motorists, transit users, pedestrians, and/or bicyclists. In some cases, these may be safety-specific projects, other projects may include elements that enhance safety. For example, in Maryland the MD 97 at MD 28 grade-separated interchange (CE1211) will contribute to a reduction in travel time, support the use multiple modal options, and enhance safety. See the safety program to learn more about several specific safety projects that TPB funded in 2021.

Ongoing Challenges

Every year, more than 45 billion miles of vehicle travel occur in the region. Addressing the complex issues of driver behavior, including distraction, impairment, speeding, and seat belt use, is difficult and requires continual effort. Further, the design and construction of infrastructure that is more forgiving of human error is challenging and resource intensive. The TPB and regional partners are committed to addressing these challenges by ensuring that the best policies, programs, and projects are implemented to reduce traffic-related fatalities and injuries.

VDOT/Flickr

TPB'S POLICY STATEMENT ON ROADWAY SAFETY

The National Capital Region Transportation Planning Board urges its members to reaffirm road user safety as a top priority and prioritize the implementation of projects, programs, and policies, in an equitable and non-racist manner. This is consistent with the TPB's Equity Policy statement that strives to reduce the number of fatal and serious injury crashes on the region's roadways by taking actions, and working individually and/or collectively as described in the following sections:

Section 1:

- Increase seat belt use among all occupants in a motor vehicle;
- Reduce unsafe vehicle speeds on all roadways in the region; and
- Reduce impaired and distracted driving.

Section 2:

- Identify and implement applicable countermeasures, especially those described in R3-2021, as appropriate and on a case-by-case basis, in an equitable and non-racist manner, consistent with the TPB's policy statement on equity.

Section 3:

- Establish and fund a Regional Safety Program at the TPB to assist its member jurisdictions and the region to develop and/or implement projects, programs or policies to equitably improve safety outcomes for all roadway users. Funding for the first year of the Regional Safety Program will total $250,000.

Section 4:

- Request member jurisdictions and agencies to adopt safety goals consistent with Vision Zero or Towards Zero Death policies and develop local roadway safety plans and ensure their equitable impacts on all road users.
- Request member states to adopt procedures that increase the use of ignition interlock devices for impaired driving offenders.

Safety Program

The TPB's has funded technical assistance for its first set of safety improvement projects through its new Regional Roadway Safety Program. Five projects will receive expert consultant services to help with planning and design. The projects were primarily selected for their potential to save lives and reduce injuries on the region's roadways. Other important factors in the selection process included a focus on serving EEAs, or areas with larger concentrations of minority and low-income populations, potential for improving road user behavior such as speeding or distracted driving, and collaboration among jurisdictions and agencies, among other criteria. The five projects are shown below.

VDOT/Flickr

Table 6.2: Year One TPB Regional Safety Program Recipients

Project Names	Project Summary
MD 650 High Injury Network Safety Study (Montgomery County)	A roadway safety audit for safety improvements along MD 650 from I-495 to MD 320 in Montgomery and Prince George's Counties.
Roadway Safety Audits and Design Recommendation for County-Maintained High Injury Network (Prince George's County)	Roadway safety audits to identify traffic safety issues faced by pedestrians and bicyclists on two Prince George's County roadway segments and design recommendations for safety improvements along these segments.
Bowie Road Safety Audit (City of Laurel)	A roadway safety audit on Bowie Road, which connects US 1 to MD 197 in the City of Laurel. The audit will examine roadway safety and traffic signal effectiveness to mitigate hazards for all road users.
Arlington School Zone Speed Camera Guidelines (Arlington County)	Develop data-driven, equitable guidelines to help identify, prioritize, and implement speed cameras in school zones, including a review and incorporation of best practices and lessons learned from other jurisdictions that have undertaken similar efforts.
Herndon Parkway (Exchange to Spring) Complete Street	Safety Improvements (Fairfax County): A Completes Streets design for Herndon Parkway in Fairfax County, between Exchange Street and Spring Street, for safer infrastructure for those traveling between the W&OD Trail, Herndon Metrorail Station, and adjacent areas.

The Policy Context

Impact of the Aspirational Initiatives

While many factors impact safety, the initiatives have the potential to improve safety in the region by enabling more people to use transit, which is safer than car travel, and improving access and safety for pedestrians and bicyclists.

Planning Factors

- Increase the safety of the transportation system.
- Support the economic vitality of the metropolitan area.
- Promote efficient system management and operation.

RTPP Goals

- Maximize operational effectiveness and safety of the transportation system.
- Ensure adequate system maintenance, preservation, and safety.

VDOT/Flickr

Voices of the Region

The Voices of the Region outreach gathered public perspectives on transportation safety in the region. The survey asked respondents whether they experienced any transportation barriers to getting where they need to go from where they live. Participants could select three options from a list of potential barriers. Nineteen percent of respondents selected "it feels unsafe to walk and bike," and 11 percent selected "I don't feel safe crossing the street."

The Voices of the Region focus groups included a discussion on safety. Staff identified common themes across the sessions. These recurring patterns provide opportunities for multi-jurisdictional regional planning to implement Visualize 2045 as well as future TPB planning activities.

Common safety themes included:

- **Pedestrian and bike infrastructure is missing.** Participants in numerous sessions said that walking and biking often feel like life-threatening activities. They noted the absence of sidewalks, crosswalks, and bike lanes. "No one wants to die on their way to work or their way home," said a suburban participant. "Protected bike lanes—not just like plastic barriers, but truly, *truly* protected bike lanes—that would be a huge thing."
- **After-hours fears.** Concerns about safety often focused on traveling in the evenings and at night. Many of these participants work in the service industry and do not have nine-to-five schedules. Participants expressed fears about walking on dark streets with the presence of fast-moving cars.
- **Aggressive driving.** Many participants, particularly from suburban locations, spoke about feeling unsafe when they drive, particularly when encountering aggressive drivers, when driving on poorly lit roads, or driving in congestion. Bike safety concerns stemmed from their perceived lack of speed limit enforcement and having to compete for road space with cars that are going 15 to 20 mph above the speed limit. To address this issue, participants suggested better enforcement of speed limits, including installing speed cameras, and placing more speed bumps across residential areas.

Transportation agencies can respond to some of the concerns reported on safety by implementing the strategies that the TPB Safety study identified, responding to the TPB safety policy and applying for technical assistance through the TPB safety program. Learn more in Appendix F of this plan which expands on regional safety planning. **Read the Voices of the Region reports online.**

Ted Eytan/Flickr

Ron Cogswell/ Flickr

Land Use

The term land-use refers to where and how we use the land in our communities. State enabling legislation guides local land-use planning, policies and roles. Land use policies and priorities in the region range from protecting land for agricultural uses to the development of affordable housing near high-capacity transit stations and focusing growth in Activity Centers. Local land use planning and coordination is a critical and effective transportation strategy, and therefore is a TPB priority, as demonstrated in the TPB Policy Framework. This plan acknowledges the complex and important relationship between land use and transportation. That relationship has shaped existing communities and can influence the future quality of the environment. Together land use and transportation influence how goods and services are distributed as well as the environment, health, community character, and economic vitality of the region's communities. Land use and transportation also influence the access to services, length of trips, travel options and how people choose to travel. Coordinated planning plays a key role in effectively using existing facilities, continuing sustainable development, and maintaining global competitiveness.

Equity Considerations

Where and how land is used in the region's communities has historical and ongoing equity implications. Historically, racial segregation in the United States limited where people of color could live, work, and how they traveled. Historical inequality

Voices of the Region

FINDING ON INNER SUBURBS

The main concern identified by people in the inner suburb's Focus Group session was the cost of getting to transit stations. People explained that they lived in areas in which biking and walking biking to transit did not feel safe. As a result, people had to take a bus to get to the train station. The cost of taking the bus, plus the train, made their commute cost high to the point that it was no longer feasible. Those who identified as being frequent drivers said that they were pushed to drive because the cost of transit was too high, and their travel route was too inconvenient.

of opportunities still impacts communities and the people in the region. Today, a primary equity issue being examined by COG and TPB is the affordability of housing and transportation costs. These costs can mean that people with low incomes and historically disadvantaged populations are pressed to make difficult tradeoffs about where to live and work, and how to travel. Costs can be a barrier to life's opportunities, including employment, education, and other important destinations. The TPB Voices of the Region focus group findings found lower income individuals were making tradeoffs due to these competing costs, such as taking a less desirable job closer to home to avoid higher travel costs. Lower cost housing, especially housing for larger families, is increasingly found in suburban or exurban communities, which are seeing an increase in lower income residents,[30] The TPB Focus Groups found that people with lower incomes, especially those in suburban or exurban areas, can find themselves with limited transportation options, pushing them into car ownership or having to travel longer distances to employment which can increase transit costs and travel time.

Together, elected officials and staff of transportation, planning, and housing agencies are working with public and private partners to examine and develop potential strategies to address the inequities in the region that are embedded in the land use and transportation relationship.

TPB's Role

The TPB and its staff collaborate with COG's Department of Community Planning and Services (DCPS) staff to support regional land-use and transportation coordination. At the policy level, the TPB, COG Board, and Region Forward Coalition work to develop long-range regional planning goals and to integrate planning policies around land-use, transportation, housing, and the environment.

Through staff support, local jurisdictions are provided with opportunities to inform the TPB about market conditions, real estate development, land-use plans, and growth forecasts for employment, population, and households. In addition, DCPS staff also coordinates closely with the National Capital Planning Commission (NCPC) and General Services Administration (GSA) in planning for the optimal locations for federal facilities throughout the National Capital Region.

The TPB Technical Committee and COG's Planning Directors Technical Advisory Committee (PDTAC) coordinate at the technical and policy level. Working through COG's Cooperative Forecasting Program, COG member local governments develop forecasts of employment, population, and households by jurisdiction and Traffic Analysis Zone (TAZ) in five-year increments through the TPB horizon year (2045 for this plan). COG staff also coordinates with adjacent MPOs (the Baltimore Metropolitan Council, the Fredericksburg Area MPO) and other jurisdictions within the TPB "Model Region" footprint to obtain similar growth assumptions for those areas.

Voices of the Region

"I think if I were a transportation official, I would focus on developing land around the stations to provide more housing and more services, like a grocery store, for example. (I would not) need to go far to get the things I needed. That would also make car-free living a lot easier. It would also make living in the suburbs car-free easier than it is now. That's the big thing, developing around stations."

— Resident of North Bethesda

30 Willow Lung-Amam, Ph.D.; Co-Authors: Katrin Anacker, Ph.D. & Nicholas Finio, Worlds Away in Suburbia: The Changing Geography of High-Poverty Neighborhoods in the Washington, DC Metro, College Park, MD, 2019, presentation to COG, Region Forward.

TPB's Travel Forecasting Subcommittee oversees how these forecasts are used to develop the regional travel demand forecasting model as well as the collection of household travel behavior data.

The TPB's TLC program supports planning for vibrant and accessible communities. The program provides technical assistance to local jurisdictions working on creative and sustainable plans and projects. It also supports a competitive selection process for the federal Transportation Alternatives Set Aside Program to fund projects aligned with the TPB's regional priorities and goals. It also provides a way for planners in the region to share information about best practices and model projects through the TLC Peer Exchange Network.

Focusing on Regional Activity Centers and High-Capacity Transit Station Areas

In 2013, COG designated 141 Activity Centers, which include existing urban centers, priority development areas, transit hubs, suburban town centers, and traditional towns throughout the region (Figure 6.6). First called for by the TPB in the 1998 "Vision Plan," Activity Centers are primarily mixed-use housing and job centers, usually near transit, and as noted in the adopted

Beyond DC/Flickr

goals of **Region Forward**, intended to be the focus much of the region's future growth. The Activity Center designation helps support land use planning and guide investments in infrastructure and development. The TPB systems performance analysis (Chapter 8) examines transportation performance related to the Activity Centers, and the TPB decennial Regional Transportation Survey examines survey results in the context of the Activity Centers.

Concentrating residential and commercial development in dense, mixed-use Activity Centers is a strategy that the TPB has encouraged jurisdictions throughout the

Figure 6.6: Growth Inside and Outside of Activity Centers — Population and Employment (Source: Council of Governments, Cooperative Forecast, Round 9.2)

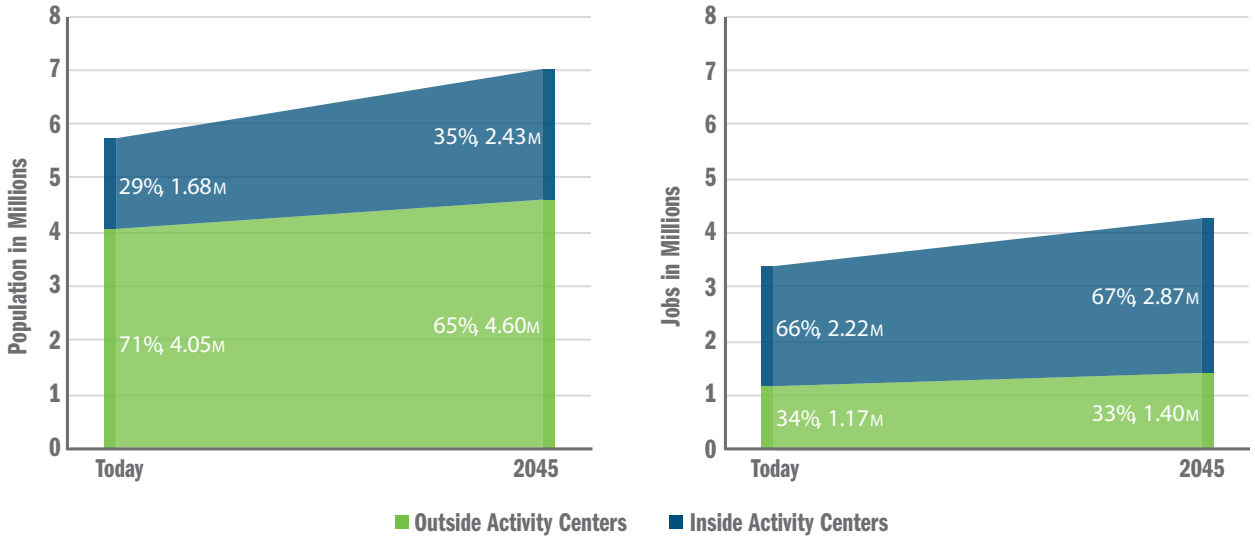
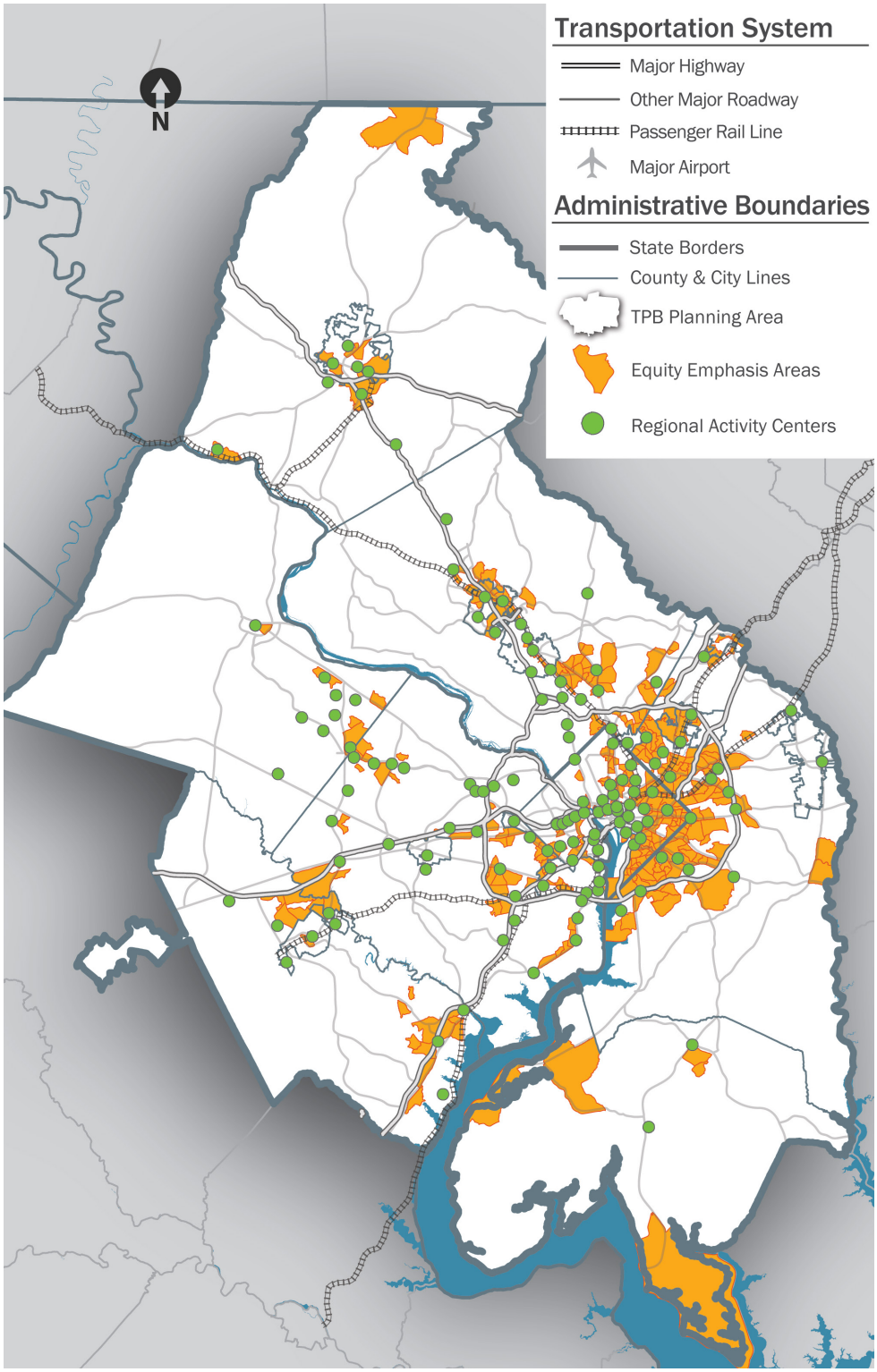


Figure 6.7: Regional Activity Centers



region to pursue to reduce the reliance on people driving alone for their daily needs. Connecting Activity Centers with high-capacity transit options and making it easier for people to move around within these areas can also help reduce reliance on driving alone, one of TPB's overarching strategies. This encouragement has paid off. Figure 6.6 shows existing development and predicted growth inside and outside of Activity Centers. Currently, 29 percent of the region's population lives within Activity Centers, and 66 percent of jobs are located within them.

In the future, growth will be even more concentrated in Activity Centers. By 2045, 35 percent of the region's population will live in Activity Centers, and 67 percent of the region's jobs are forecasted to be in Activity Centers.[31] By pushing the pace on implementing policies that encourage development in Activity Centers, promoting housing affordability in Activity Centers, and by continuing to invest good public transit, the region can reap even greater benefits from this type of land use planning.

31 MWCOG Cooperative Forecast 9.2

Addressing Affordability and Focusing Growth

Today there is a mismatch between the amount of housing and jobs. This affects the area's affordability, potentially undercuts the region's appeal to new companies and talent and necessitates commuting into the region for work, straining the transportation system. In seeking a better balance between growth in jobs and housing, a TPB task force determined a jobs-to-housing ratio of 1.54 that could optimize economic competitiveness and improve future transportation system performance. Using the ratio, COG determined the region needs, by 2030, at least 75,000 additional households beyond those currently anticipated. As reported in COG's report, the Future of Housing in Greater Washington (2019) this is the region's "housing shortfall," and it is expected to worsen without intervention.[32]

Bossi/Flickr

To address the regional housing shortfall and affordability challenges in 2019, the COG Board of Directors approved three Housing Targets:

1. The Region needs 320,000 housing units in the next 10 years, 75,000 more than currently anticipated.
2. At least 75 percent of all new housing, or 240,000 total units, should be in Activity Centers or near high-capacity transit.
3. At least 75 percent of new housing should be affordable to low and middle-income households.

The region is responding to the day-to-day challenges of people who are struggling with high costs of housing and transportation by focusing on more housing, including more affordable housing options, in places where people will have better access to transit, biking, and walking. A recent analysis by the TPB determined that additional housing in the region would improve transportation system performance, particularly if those units were strategically located in Activity Centers and near high-capacity transit stations.

In endorsing an Aspirational Initiative to **"Bring Jobs and Housing Closer Together"**, the TPB is calling upon regional leaders to promote policies encouraging more housing in general and more housing near transit and in Activity Centers. The TPB and COG boards, through separate resolutions, have prioritized growth around high-capacity transit stations, also endorsing using EEAs as a planning tool. **Learn more here.**

Visualize the Future

Through coordinated land use and transportation planning, the region has prioritized employment, population, and household growth in Activity Centers and near premium transit. Two-thirds of forecasted employment growth and nearly one-third of forecasted population growth between now and 2045 is forecasted to be in Activity Centers. With continued coordination, these urban centers, suburban town centers, traditional towns, and transit hubs will continue to develop into vibrant places that support the region's economic vitality.

32 The Future of Housing in Greater Washington, Metropolitan Washington Council of Governments, 2019; mwcog.org/file.aspx?D=fm3D7QGdShaKtXGTFc%2F2%2FkmFDELDfmztf9tyGOazIfE%3D&A=%2BMuPOFdKMk3DLhEx3thTiAUvJU8YEzEd4F5hNvLignY%3D

angela n./Flickr

Through investments in and beyond the constrained element of the plan, more people will have access to walkable communities with more affordable housing and a wider range of transportation options. The sponsors for the projects in the constrained element identified numerous projects as supporting land use planning coordination, with 117 connecting one Activity Center to another with another 79 connecting an Activity Center to another part of the region, and 129 of these connecting an Activity Center to an EEA. Project sponsors identified 127 projects in the constrained element as promoting the "Bring Jobs and Housing Closer Together" initiative and 314 projects as supporting the federal economic vitality planning factor. For example, a project that will accommodate increased transit-oriented development is the Ballston-MU Metro Station West Entrance (CE3633) in Arlington. This project will construct a second mezzanine and sidewalk entrance to the station. In the City of Alexandria, the new pedestrian bridge over I-395 at Landmark (CE3768) will improve walk access to a new transit hub. The Sterling Boulevard Extension (CE3329) is planned to help connect the roadway system with new transit stations. Beyond the constrained element, grant recipients of the TPB's Transportation and Land-Use Connection program will contribute to a brighter future.

For example, the program funds the preliminary design for new shared-use path connection within Broad Run Transit Access Focus Area (TAFA), making it easier for people in the City of Manassas, VA to take VRE rail to work, or for people to travel to DC to access jobs.

Ongoing Challenges

While transportation and planning agencies take steps to achieve the regional land-use and transportation targets and goals, it is important to acknowledge that more than three-quarters of the total number of jobs and housing forecast for the year 2045 already exist. Much of the region's transportation system, housing and employment centers are already in place. New jobs will continue to be more concentrated in Activity Centers and more housing will be developed in Activity Centers than in the past. In establishing the 2019 Housing Targets, however, the Planning Directors, Housing Directors and COG Board acknowledged the tremendous challenges in preserving and creating new affordable housing within Activity Centers. Planning for new development is a long-term investment in the region.

The Policy Context

Impact of the Aspirational Initiatives

The initiative Bring Jobs and Housing Closer Together is focused on land use and transportation coordination. The region can optimize regional land use by focusing new development in Activity Centers and near high-capacity transit so people that live and work in the region will have more options for housing and travel and better access to life's destinations.

Planning Factors

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.
- Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and state and local planned growth and economic development patterns.

RTPP Goals

- Promote a strong regional economy, including a healthy regional core and dynamic Activity Centers.

Freight Planning

Each year millions of tons of freight valued in the billions of dollars move over the region's roadways and railways and pass through its airports, contributing to the economic vitality of metropolitan Washington. Nearly every physical thing, from food to clothes, from medicines to the furniture in homes, and everything in between was transported on a truck for at least some part of its journey. The TPB has an important role to play in ensuring that the regional transportation system continues to be responsive to and supportive of the freight demands placed upon it by its residents, businesses, and visitors.

Equity Considerations

The costs and benefits of freight transportation should be distributed equitably. Freight-related environmental justice issues arise when the costs (externalities) of freight, such as noise and air pollution, are unfairly concentrated in low-income and minority communities. Conversely, it is also unfair for the benefits of freight innovations, such as low-or zero-emission freight vehicles, delivery lockers, etc. to be concentrated in higher income neighborhoods.

Bossi/Flickr

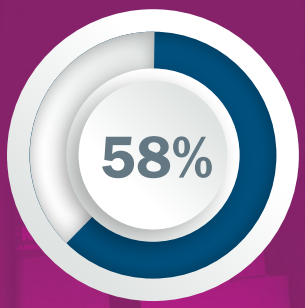
TPB's Role

Planning for freight movement and parking is a collaborative and education-oriented process. One of the TPB's key roles in freight planning is to host the TPB Freight Subcommittee, which provides a venue in which both public- and private-sector representatives share information and provide freight-related input to the regional transportation planning process. Other key activities include fostering coordination on freight transportation issues and disseminating research findings to member jurisdictions and other public- and private-sector stakeholders.

The National Capital Region Freight Plan is produced (or updated) roughly every four years. This plan describes the role freight transportation plays in the region's economy, discusses the drivers of freight demand and the freight flows resulting from it. It identifies the most significant freight issues in the region and provides policies and recommendations to ensure the multimodal freight transportation system continues to support the economy of the region and the quality of life of its residents and visitors. The most recent update was completed in 2016 and includes a set of 17 freight policies developed and approved by the TPB. **The Freight Plan, policies, as well as information about other freight topics can be found at mwcog.org/freight.**

Voices of the Region

ON FREIGHT NEEDS

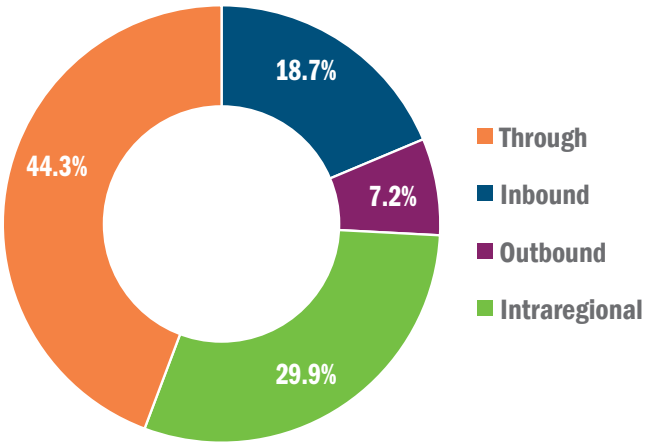


Freight Needs in our Transportation Future

One year after the pandemic is over, a majority (58%) say that they expect their online shopping habits to continue.

This could have lasting impacts on long-range regional planning, including addressing changing demands for retail space and freight-related needs.

Figure 6.8: Direction of Freight by Weight



- Inbound freight is moved from other states, or other countries, to the region.
- Outbound freight is moved from the region to other areas of the United States or to other countries.
- Intraregional freight is moved from one point in the region to another point in the region.
- Through freight is moved from a location outside of the region to another location outside of the region via transportation infrastructure within the region.

Visualize the Future

Efficient movement of goods is vital to the economy and is an enabler of livability that supports businesses of all types and allows residents of the region to enjoy a high quality of life. Analyses of federal data indicate the region receives about 2.5 times more inbound freight than outbound freight (see Figure 6.8). The forecast for continued economic growth along the Eastern Seaboard, throughout the nation, and across the world will result in greater quantities of goods moving into, out of, and through the region. Through collaborative efforts and planning, the TPB is committed to helping the region realize the benefits of freight while mitigating its negative externalities.

The sponsors for the projects in the constrained element identified 185 projects that support the freight planning factor and increase accessibility and mobility of people and freight. They identified numerous projects that enhance, support, or promote freight movements, including 58 projects that support long-haul trucking, 162 that support local delivery, eight freight rail projects and 17 that support freight air. Examples cited by the project sponsors include the Virginia Passenger Rail Authority Rail Capacity Projects (T6727) and Alexandria 4th Track Project (T6673) that will double the long-term capacity for passenger and freight rail traffic and improve the reliability of rail service. In Frederick County, MD, the I-70/US 40 Corridor project (CE1187) will reduce travel times and is designated priority freight movement project in the MD State Freight Plan; I-70 is a component a network TPB identified as important freight corridors within TPB's planning area. The MD 85 corridor in the county

The Policy Context

Impact of the Aspirational Initiatives

By addressing the congestion and mobility challenges forecast for the region, the initiatives would improve the ability of the transportation system to respond to the needs of freight movement.

Planning Factors

- Increase the accessibility and mobility of people and freight.
- Enhance the integration and connectivity of the transportation system across and between modes for people and freight.

RTPP Goals

- Promote a strong regional economy, including a healthy regional core and dynamic Activity Centers.
- Support inter-regional and international travel and commerce.

will alleviate existing safety, capacity, and operational deficiencies while accommodating traffic increases in the county's primary commercial and employment corridor. Beyond the constrained element, as small package deliveries increase, regional agencies continue to work together on curb management to help communities rethink how to accommodate the numerous uses that require curb space on streets, from bicyclists and scooters to transit and freight.

Ongoing Challenges

During the COVID-19 pandemic, people increasingly turned to e-commerce to get needed goods delivered to their homes, accelerating a trend that was already well-established. Businesses have rapidly evolved to accommodate the heightened demand. This continued expansion of e-commerce has increased the number of trucks competing for the limited supply of roadway and curbside space, increasing curbside management challenges. Street design features common in more densely populated areas, such as bike lanes and narrower intersections with tighter turning radii, make it more difficult for trucks to navigate turns, and trucks making deliveries can block access for pedestrians and cyclists. As more trucks operate in dense urban areas and deliver goods to homes on residential streets, the negative aspects of freight such as unwanted noise, pollutants, and vibrations from freight vehicles present significant challenges to communities in the region.

Photo by FAM

Funding

Funding for the transportation system flows to and through the TPB from federal, state and local sources. Approximately 81 percent of the federal, state, local and transit agency transportation funding is allocated to the maintenance and operations of the existing infrastructure, leaving only 19 percent for system enhancements. To meet the growing demand for an efficient and resilient transportation system the region needs to make the most of every dollar.

Equity Considerations

As transportation agencies invest funds in projects, programs and policies, the impact of those projects on the opportunities in life accessible to disadvantaged individuals and people with low income can be examined by looking at whether and how those investments serve the TPB equity emphasis areas (EEA). Sponsors of projects indicated that 109 projects in the constrained element of this plan are in EEAs, and 129 projects connect an EEA to a regional Activity Center, totaling an estimated $41.8 billion in project funds. These projects should help improve the transportation options in EEAs for people that live in and near them. They should also help people move between EEAs and regional Activity Centers, where there are higher concentration of jobs and other life destinations. Like the TPB's past plans, upon approval, the TPB staff will conduct a federally required environmental justice analysis to examine how the future transportation system is forecasted to serve the EEAs compared to the entire region. This analysis is used to inform plans and to inform planning and development of the long-term projects in the plan.

TPB's Role

The TPB prepares plans and programs that the federal government must approve for federal-aid transportation funds to flow to the Washington region. The TPB must demonstrate that this update to Visualize 2045 is financially constrained. This means that the region must show it can reasonably anticipate revenues to cover the projects, programs and policies listed in the constrained element of the plan that extends to 2045. The TPB also supports ongoing flow of funds by administrating the TIP.

Photo by DDOT

Beyond federal requirements, as needs and opportunities arise, the TPB conducts studies and coordination activities to explore and inform possible revenue streams and funding strategies. The TPB led regional coordination, resulting in a dedicated funding agreement for Metro in 2018, with the governments of Maryland, Washington, the District of Columbia, and Virginia jointly providing up to $500 million annually to fund the Washington Metropolitan Area Transit Authority (WMATA). The funds are used to repair and sustain the Metro system, including improving rail cars and buses, replacing older equipment and catching up on delayed repairs across the 50-year-old system. This commitment is the first stable funding source for Metro since it was established in 1967. The funding amounts for each government are calculated according to population density, average weekday ridership and the number of stations operating in each region.

In 2014, the TPB began the long-range plan task force study. The 2014 performance analysis of the constrained element of the plan underwhelmed the TPB in terms of moving closer towards the region's goals. It forecasted that road congestion and transit crowding

would increase significantly in the coming decades despite the investment of about $250 billion dollars across the region of which about $42 billion was for system expansion. Relative to the forecast growth in travel demand, the proposed capital investment was noted to be inadequate. In response, the TPB conducted a study to identify what would help the region meet its goals. The analysis and consensus building discussions led to the TPB endorsing the Aspirational Initiatives in 2018. The initiatives are concepts that agencies are already advancing in the region. With additional focus on planning and funding more of such concepts, the initiatives could be expected to improve the function of the transportation system.

Visualize the Future

By 2045, metropolitan Washington will be home to 1.3 million more people and nearly 1 million more jobs.

Available funding for transportation and the types of planned improvements cannot do enough to prevent significant increases in congestion and travel delays. To ensure a quality transportation system in the future, it must be maintained today. As agencies in the region advance projects that respond to regional and local goals, those enhancements to the system will help people have more reliable travel options that will allow them to arrive on time and safely. With changes in travel behavior, fuel use and energy sources, the region's transportation system can reduce its carbon footprint. The sponsoring agencies identified 131 projects in the constrained element of the plan that contribute to enhanced system maintenance and preservation. They identified numerous projects as implementing the Aspirational Initiative concepts and as mitigating GHG that impacts climate change. See more in Chapter 7, Funding the Transportation System.

Ongoing Challenges

With most funding directed to maintaining and operating the extensive transportation system that already serves the region, prioritizing the use of remaining funds among the many competing needs is a challenge. While the Congress recently passed a new funding package, often, federal funding is uncertain over the long-term, and the many difficulties in raising additional funding for transportation have been, and will continue to be, challenges. The fact that transportation funding is "siloed" can challenge agencies as well, since most federal funds can be used only for specific purposes. Learn more in Chapter 7, Funding the Transportation System.

The Policy Context

Impact of the Aspirational Initiatives

While most funding is dedicated to preserving the existing transportation system, the initiatives provide the opportunity for the region to make the most of every dollar spent on transportation enhancements.

Planning Factors

- Emphasize the preservation of the existing transportation system.

RTPP Goals

- Maximize operational effectiveness and safety of the transportation system.
- Ensure adequate system maintenance, preservation, and safety.

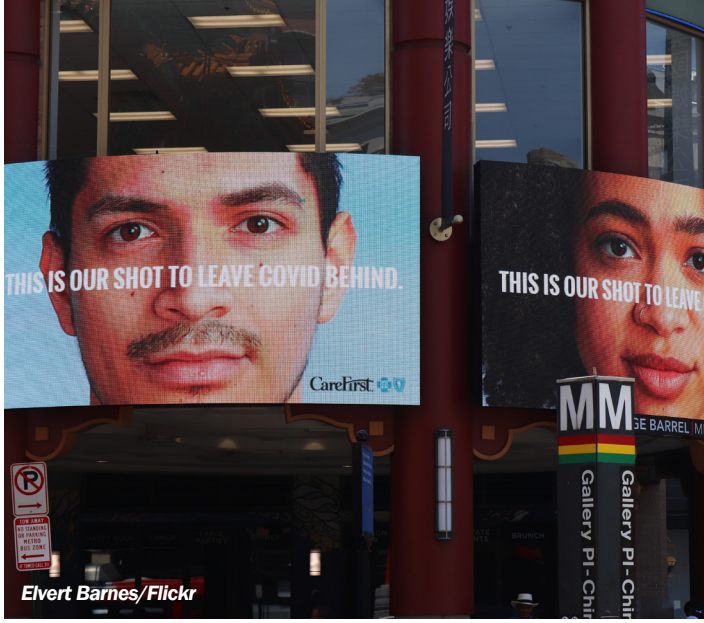
Public Health

Considering public health in the transportation planning process is vital to advance the delivery of healthier communities, and underscores investments in walking and biking and other active travel options. Public health considerations include access to transportation options, access to goods and services, and issues such as air quality and traffic safety. Impacts of COVID-19 have raised new transportation planning considerations. By aligning transportation planning with public health considerations, it is possible to plan for healthier communities and better outcomes.

Equity Considerations

Public health, transportation, and equity are closely interrelated. As discussed in Chapter 2, environmental and transportation impacts can lead to significant health risks through exposure to certain forms of air pollution. National studies and reports have found that communities of color are more likely to experience higher levels of these emissions compared to other communities. This is due to the location of the communities being close to congested or high-volume roadways. EEAs in the region, small areas with high concentrations of individuals with low income, communities of color, or both, experience 57 percent greater traffic volume than non-EEAs.[33]

In 2018, the Virginia Commonwealth University (VCU) Center on Society and Health conducted a study for COG called Uneven Opportunities to analyze the health of the region at the neighborhood level. Using census tracts, it measured differences in life expectancy across the region along with the social determinants of health contributing to life expectancy. The data was used to create a tool measuring life expectancy in the census tracts called the Healthy Places Index (HPI). The HPI can be used by transportation policymakers and providers to help prioritize transportation investments and improve transportation options for neighborhoods with the greatest health needs. The TPB considers the EEAs in its planning and grants administration to improve safety and access to transit and other destinations for people that choose to bike or walk.



Elvert Barnes/Flickr

Voices of the Region
ON HEALTHY TRAVEL

Approximately 6 out of 10 respondents supported more or wider sidewalks and bike lanes (63%), even if it meant a reduction in parking availability.

"Future transportation investments should emphasize health benefits of car-alternative travel like biking and walking, which are forms of exercise and reduce pollution."

— Resident of the District of Columbia

"I just think everybody should have a walkable neighborhood. Where everyone has equal access to grocery stores, dairies, pharmacies...there are so many places in the area that are food deserts. So people are forced to get into their car and go to another neighborhood to shop."

— Resident of Prince George's County

33 TPB Staff Analysis of US EPA EJ Screen Data Retrieved from US DOT Traffic Data; 25th Percentile of Region Block Groups in Traffic Proximity and Volume, 2017

Elvert Barnes/Flickr

TPB's Role

Working towards a healthy region for all residents and visitors involves planning and coordination across borders on issues from everyday wellness to emergency response. Engagement with land-use, transportation, and environmental decision-makers is also critical since health is so closely tied with the communities in which people live.

The TPB actively supports strategies that benefit the safety and public health of the region. Many of the TPB's Aspirational Initiatives prioritize fewer vehicle trips and support increased infrastructure for multimodal options, including walking and biking. These infrastructure improvements include protected bike lanes, bike and walk paths, and bikeshare. These additions—coupled with TPB bikeshare and e-scooter coordination workshops—work together to promote a safer and healthier lifestyle in the region. The TPB also conducts air quality and pollution analysis. Results of this analysis help to provide agencies with data showing impacts of the transportation system and how communities are affected.

The TPB tracks and reports a range of impacts and planning efforts related to the COVID-19 pandemic, which was also a topic in the TPB's Voices of the Region and Commuter Connections surveys.

Visualize the Future

The federal requirements regarding air quality and environmental impacts as considered in the National Environmental Policy Act underscore the relationship between the environmental health and health of the public. The TPB has several resources available that can work together to improve public health in the region.

The Policy Context

Impact of the Aspirational Initiatives

Working together, the initiatives provide the opportunity for reduced emissions and improved connectivity that could include better access to destinations that impact public health, such as grocery stores and medical facilities.

Several initiatives aim to improve the safety of and access to options for active travel.

Planning Factors

- Increase the safety of the transportation system for motorized and nonmotorized users.
- Protect and enhance the environment, promote energy conservation and improve the quality of life.

RTPP Goals

- Maximize operational effectiveness and safety of the transportation system.
- Enhance environmental quality, and protect natural and cultural resources.
- Provide a comprehensive range of transportation options.

Application of resources like the Healthy Places index and making investments in infrastructure for biking, walking, and other infrastructure that improves air quality can improve future health outcomes.

There are many projects in and beyond the constrained element that improve safety, increase opportunities for active travel, and work to improve and maintain environmental health from air and land to waterways. The sponsors for the projects in the constrained element identified numerous projects that promote, enhance, or support improved active travel including 211 projects that make it easier to walk and 205 projects for biking or use of micromobility options such as e-scooters. They also identified 162 projects that implement the initiative "Improve Walk and Bike Access to Transit" and another 32 that implement the initiative to "Complete the National Capital Trail Network". Project sponsors identified 181 projects that are anticipated to reduce criteria pollutants, 185 that mitigate GHG and 209 that support environmental health.

For example, in the District of Columbia, the New York Avenue Streetscape and Trail Project (CE3655) will construct bicycle and pedestrian facilities where none currently exists, thereby reducing trips by SOV, providing options for active travel, and potentially mitigating vehicle trips that would produce emissions.

Ongoing Challenges

As of 2022, the many uncertainties with the future of COVID-19 and the reopening of businesses and schools remain. As vaccines are produced and residents attempt to return to their daily lives, variants of the virus have also emerged that set things back. COG and the TPB will continue to monitor, report, and support the region and its localities during these times. Challenges in air quality and emissions are present with the region expecting an increase of over 20 percent more residents and jobs by 2045. To combat this challenge and improve public health, the TPB supports initiatives, programs, and policies that promote the use and access of multimodal options as an alternative to vehicle trips. Safety is also an ongoing challenge. The TPB is working to reduce transportation fatalities and injuries through analysis and studies so that residents and workers can live and travel safely throughout the region.

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VDOT/Flickr

Management and Operations

People who use the transportation system look for a range of comfortable, reliable and practical options that meet their transportation needs. Travelers and freight movement in the region need information to know what to expect on the transportation system to make decisions about when and how they will travel. The TPB and its members work together to manage demand, coordinate the management and operations of the transportation system, provide information to travelers, and examine new technology options and their potential impacts.

To maximize past investments in the region's extensive transportation system and get the most out of the existing transportation system is an important goal of the TPB. Actively managing the system, through management and operations planning and techniques, is one of the most effective ways to accomplish this goal.

Transportation agencies are tasked with ensuring that the region's transportation system operates efficiently when faced with incidents, emergencies, or varying travel conditions. See Chapter 8, Planning for Performance, to learn more about Visualize 2045's federally required Congestion Management Process and the strategies to reduce recurring congestion. Examples of management and operations (M&O) planning and techniques include providing real-time traveler information that keeps people informed, ramp metering, timing traffic signals to improve traffic flow, and creating response plans for managing incidents when they occur. Applying current and evolving information technologies such as these often shows strong benefit-cost outcomes.

Equity Considerations

An effectively managed transportation system can benefit all travelers by bolstering safety, reducing delay due to incidents, and improving reliability. Transportation agencies must ensure that M&O strategies do not have disproportional impacts to any population or area, nor to transit riders, bicyclists, or pedestrians. Moreover, strategies that improve equity should be priorities for implementation, and approaches should benefit all populations and areas of the region. New applications and technologies that support M&O, such as real-time travel information, should consider who has access to the technologies that will be used and how to ensure all people are able to benefit from real-time information.

TPB's Role

The TPB Vision states that "[the] Washington metropolitan region will use the best available technology to maximize system effectiveness." The TPB and the region's transportation operators pursue efficient and effective M&O solutions to the region's transportation problems through committee work and other activities such as the Metropolitan Area Transportation Operations Coordination (MATOC) program.

TPB's Systems Performance, Operations and Technology Subcommittee (SPOTS) explores ways M&O strategies can improve congestion, safety, maintenance, and system efficiency. Identifying technologies, projects, and actions that will support effective M&O in the region is a core SPOTS planning program activity. The TPB also maintains a Regional Intelligent Transportation Systems (ITS) Architecture website that provides a regional ITS

framework for the foreseeable future and serves as a resource for developing ITS technology. Additionally, emerging technologies such as CAVs will impact how the public chooses to travel or move goods in the region. SPOTS monitors CAV and other technological developments for their impacts and opportunities. (Learn more in the CAV Highlight). **More information about TPB's M&O activities can be found at mwcog.org/mgmt-ops.**

Visualize the Future

People and freight in the region rely on robust transportation-related information technology every day. New technologies continue to advance and are increasingly integrated so that phones, infrastructure, vehicles, and even bicycles can connect, monitor, and communicate about the transportation system. The demand for reliable, current and dynamic information is growing. The TPB continues to expand its use of new and emerging data and tools in regional transportation planning, and has been examining the potential use of big data products. Transportation agencies are advancing technological capabilities with useful features that benefit people and freight moving in and through the region. Sponsors for projects in the constrained element identified 84 projects that are expected to reduce travel time without adding capacity, and 239 projects that respond to the need to maximize operational effectiveness and safety of the transportation system.

- **MDOT's I-270 Innovative Congestion Management Project** that uses a two-pronged approach that combines roadway improvements with innovative technologies and techniques such as applied Intelligent Transportation Systems (ITS), use of cameras and sensors to monitor traffic volumes and communicate to dynamic traffic management, and real time communications to drivers.
- **The VDOT and NVTA "Virginia Regional Multi-Modal Mobility Program" (RM3P)** partnership leverages the collaborative use of real-time data by Virginia's public and private sectors to improve travel safety, reliability, and mobility, and to give the public the tools to make more informed travel choices.
- **DDOT's MoveDC plan** has established Mobility Priority Networks that "show where DDOT will invest in safety and mobility improvements for specific modes of transportation. The goal of these networks is to make it easier to move both people and goods while enhancing safety, efficiency, connectivity, and access.
- **Through the Commuter Connections program**, the TPB promotes TDM strategies implemented by TPB members and other private partners, to provide alternatives to driving alone and offer simple ways to find other travel options, with the goal of easing congestion on the roads.

The Policy Context

Impact of the Aspirational Initiatives

Technology, management, and operations will be key components of the BRT and regional express travel network initiatives. Real-time systems monitoring and "smart" infrastructure enable the safety and travel efficiencies that are key objectives of these initiatives.

Planning Factors

- Increase the safety of the transportation system for motorized and nonmotorized users.
- Improve resiliency and reliability of the transportation system.
- Promote efficient system management and operation.
- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency.

RTPP Goals

- Maximize operational effectiveness and safety of the transportation system.


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Operational improvements using communications and other new technologies can be very cost effective and are increasingly common solutions. For example, in certain corridors, equipment detects changing traffic flows and automatically adjusts signal timing accordingly. Advanced data systems share traveler information, whether through public services such as agency websites, mobile phone apps like the Commuter Connections incenTrip, or the media. This helps the public avoid recurring and non-recurring traffic congestion. It enables travelers to choose between options of driving, taking transit, biking, walking, or scooting. Electronic signs and apps show when the next bus will arrive at a stop, freeway signs show the travel time to the next major interchange, and information available on mobile phone apps enables travelers to make safe, timely, reliable, and environmentally mindful travel choices.

In the future, these technologies that are currently available will become more widespread; more robust and dynamic technology will enhance the operation of the transportation system to help people travel more efficiently in the region.

Ongoing Challenges

The challenges to effectively managing and operating the transportation system are always evolving, The TPB and COG examine issues that will impact how the system functions, such as climate change impacts, where and how people make purchases, equity considerations, and technological evolutions implemented by the public and private sectors. Rapid technological changes challenge transportation agencies to keep up because today's cutting-edge technology is tomorrow's outdated one. Agencies will also need to coordinate to ensure technologies are interoperable when necessary. The public's travel patterns change quickly based on cost, need, and the options provided to them as well as outside factors like the impacts of the global pandemic that began in 2019. Transportation agencies will need to anticipate needs and adjust. The TPB helps regional transportation agencies face these challenges by continually facilitating information exchange and collaboration, examining potential impacts of technologies, and encouraging technology that is compatible across jurisdictional boundaries.

Emerging Technology

While technological advancement is at the heart of M&O, questions as to when, how, and who will be implementing technologies means there is much uncertainty. Transportation agencies anticipate that the shift from today's automobiles to CAVs will have broad and significant impacts on various facets of mobility and society: traffic safety, personal and freight mobility, changing models of vehicle ownership and use, public transit services, and where people choose to live and travel. Given the sheer number of factors that will influence CAV deployment, much uncertainty surrounds how CAVs will function on the highways and local roads. However, CAVs are likely to impact regional transportation planning to meet our goals and priorities and will impact planning activities in significant ways.

The TPB conducted a study with consultant support and guidance from a temporary working group. The result was a white paper to assist the TPB in addressing that uncertainty in planning for CAVs on the region's transportation system. Specifically, it looks to inform regional conversations on CAVs and TPB's role related to this topic by examining:

- Areas where TPB goals, policies, and activities may substantially interact with CAVs.
- Potential CAV deployment impacts (issues, challenges, opportunities) as they relate to corresponding jurisdictional authorities and roles (primary, secondary, collaborative).
- Opportunities to enhance CAV considerations within TPB's planning products/activities.

The paper also supports development of the region's planning, policy, and programming priorities related to CAVs and identifies actions the TPB may take to further achieve its goals and minimize the potential for adverse impacts as CAVs are deployed. Resulting from this work are the TPB's regional CAV principles to guide the planning and future incorporation of CAV into the transportation system.

CAV Impacts: Relation to Regional Goals and Agency Roles

Research conducted for the white paper identified the following areas of CAV deployment impact, which pertain directly or indirectly to the role of regional long-range transportation planning in the metropolitan Washington region and to the roles of transportation agencies generally:

- **TRAVEL:** includes impacts that directly relate to the mobility of the traveling public, motor carriers, and other road users (access, active/public transportation, goods movement, travel behavior, and safety).
- **SOCIETAL:** includes impacts of broad societal concern (equity, employment/economic development, environment, and land-use).
- **ORGANIZATIONAL:** includes impacts directly related to the activities and responsibilities of infrastructure owner/operators and transportation planning agencies (data coordination, emergency preparedness, funding, infrastructure, operations, reliability, security/privacy, and travel forecasting).

Ivan Radic/Flickr

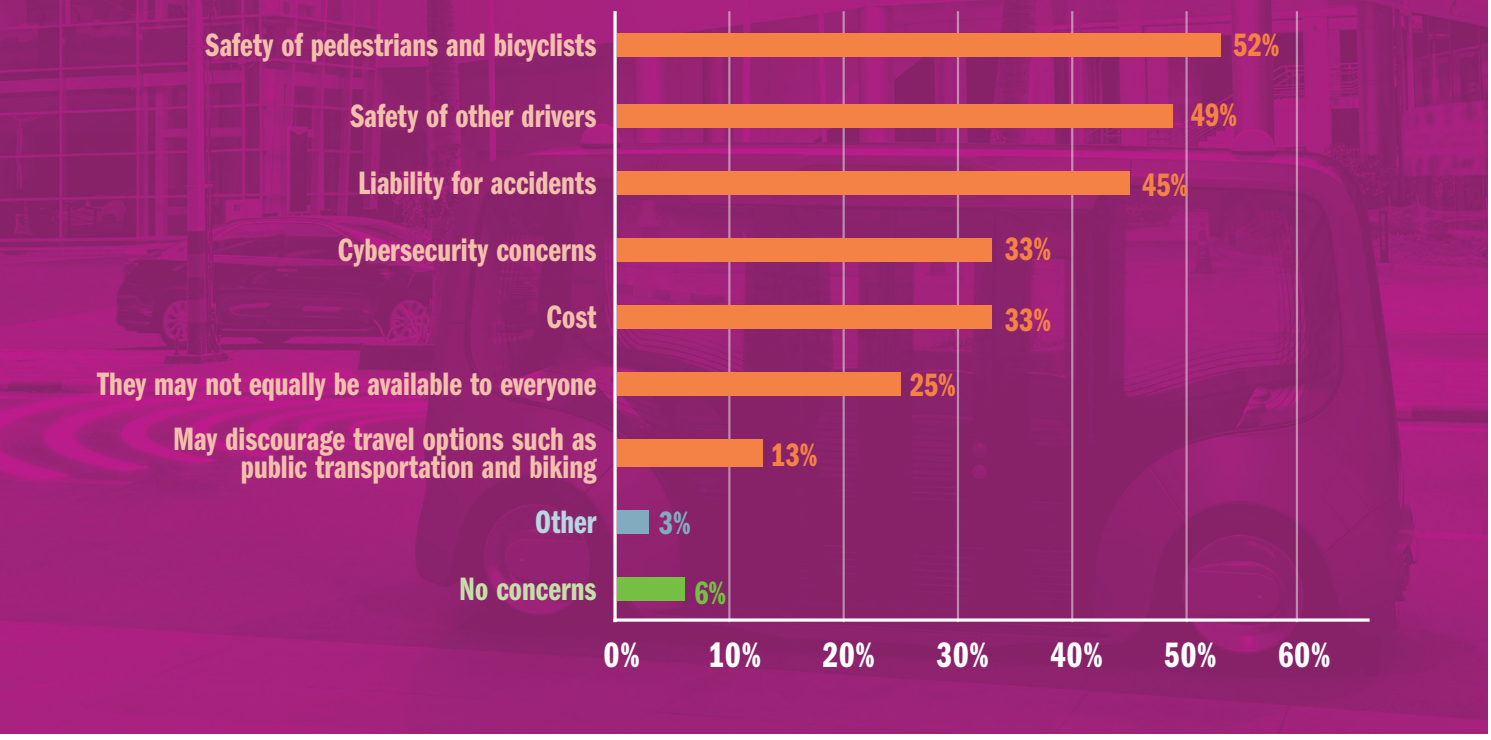
The white paper provides a link between the CAV deployment impact areas/categories and select TPB policy goals and objectives. This helps demonstrate the relevance of CAV impacts to nearly every area of the agency's goals and activities. Relative levels of certainty and risk associated with each of the impact areas are also explored. The white paper identifies high-level roles for transportation agencies at various jurisdictional levels as they relate to CAV deployment.

Equity Considerations

The ongoing evolution and implementation of CAVs requires a close examination of equity concerns such as how to ensure the benefits of the new technologies are affordable and available to all. Making vehicles available through shared mobility is an example. Looking ahead, agencies will need to consider access for vulnerable and disadvantaged populations such as those with low incomes or those who lack credit cards that are often required for services. When the topic of CAV was discussed with the Access for All Advisory committee, concerns were raised over the potential for inequitable distribution of shared mobility services and vehicle design to accommodate people with physical disabilities. Committee members recognized that CAV might provide improved connections and services for people that cannot drive: over 2.7 million adults in the District of Columbia, Maryland, and Virginia have a disability that might impact their ability to drive.[34] Other benefits might include better access for people in remote or underserved areas and the reduced need for private vehicles.

As technology can solve inequities as well as create new ones, planning for equity must remain at the forefront for CAV, for example considering equity during testing and implementation of new technologies.

Voices of the Region ON DRIVERLESS CARS



34 Behavioral Risk Factor Surveillance System Data – BRFSS, 2019, for the District of Columbia, Maryland, and Virginia

Transportation Planning Board CAV Principles

The TPB staff worked with the SPOTS, CAC, and AFA Committees to develop a draft set of principles for review based on findings and recommendations of the CAV white paper, discussions during the four CAV webinars TPB hosted in 2020 and 2021, and other existing TPB policy documents. The TPB approved these principles at its January 2022 meeting as part of this update to Visualize 2045.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CAV Principles

Any deployment of CAVs in the National Capital Region should:

1. Ensure the safety of everyone on or near transportation facilities, in all situations.
2. Ensure CAVs' benefits are available equitably to all people in the region and avoid disproportionate negative impacts to any group or community.
3. Increase mobility options for all.
4. Increase opportunities for and quality of accessible transportation, including for persons with disabilities.
5. Maintain and enhance opportunities for and the quality of bicycling and walking in the region.
6. Retain the operational priority for ridesharing and transit vehicles on the region's roadways.
7. Enhance the provision of transit, including providing opportunities for microtransit access to the region's high-capacity transit (HCT) stations.
8. Bolster regional environmental and land use objectives, including prioritizing shared vehicles and advancing decarbonization of the transportation system.
9. Prioritize reduction of vehicle miles of travel and minimize zero occupant vehicle miles of travel.
10. Ensure freight and goods movements that help minimize disruptions and facilitate livability of the region's communities.
11. Ensure security (including cybersecurity) and privacy and prevent risks to people and infrastructure.
12. Interoperate safely with non-automated vehicles, vehicles with differing levels of automation, and all other transportation system users.
13. Be accompanied by addressal of legal liability issues relating to crashes, failures, and safety, including ensuring that CAVs at varying levels of capability are operated within those vehicles' technological capabilities and limitations and stipulating safe and responsible actions and choices by vehicle manufacturers, owners, operators, and users.
14. Bolster effectiveness of emergency and incident response, systems management by traffic operations centers, and information sharing among agencies and the public.
15. Bolster interjurisdictional coordination and technical interoperability among TPB member agencies, in conjunction with relevant national efforts and standards.
16. Provide public revenues that are no less than the costs they impose on infrastructure, transportation systems management and operations, and communities.
17. Make data freely available to TPB member agencies to enhance planning, operations, and emergency preparedness and response.
18. Be accompanied by robust efforts by TPB and member agencies to keep abreast of evolving technology to enhance support of TPB's goals.

Emergency Preparedness and Transportation Security

The transportation system plays an important role in emergencies ranging from everyday traffic incidents to major disasters. Many events over the years, notably the attacks of September 11, 2001, serve as reminders that the region must be as prepared as possible. Preparedness and security are key concerns of the TPB.

Equity Considerations

Ensuring the safety and security of all populations, including the most disadvantaged, is critical to consider in planning for emergency preparedness and transportation security. The TPB conducts analysis using the EEAs to examine where the most disadvantaged populations live and the types of travel options used. This information can inform and be used by planners for this planning area.

TPB's Role

Visualize 2045 both supports and reflects a wide-ranging set of emergency preparedness planning activities. The TPB coordinates efforts with COG's Homeland Security and Public Safety program, which brings together emergency preparedness and public safety officials from across the region. Together, COG and TPB help facilitate coordination across the region to ensure the preparedness, resiliency, and safety of the transportation system. Federal, state, and regional homeland security requirements are fulfilled through numerous COG committees that convene transportation and public safety subject matter experts, especially COG's Transportation Emergency Preparedness Committee. **For more information, visit mwcog.org/public-safety-and-homeland-security/planning-areas.**

Visualize the Future

The public depends upon the mobility and accessibility that the region's transportation system provides. Emergencies can place exceptional strains on the transportation system at times when the transportation system is so critical to the public's well-being. Being as ready as possible, whether through resilient infrastructure, operational programs, or information sharing, is vital in transportation's role in emergencies. By coordinating efforts, the TPB and COG help the region prepare for emergencies and incidents today and into the future. Sponsors of the projects in the constrained element identified 142 projects that respond to the federal planning factor regarding homeland security.

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MDOT/Flickr

Ongoing Challenges

The region's transportation and public safety agencies regularly work in close coordination to address issues of security and emergency preparedness. Risks to the security of the region's transportation system, including cybersecurity threats, are myriad and constantly evolving. Emerging technologies such as CAVs may bring new and different emergency preparedness challenges in the future. Regional officials are tasked with the challenge of prioritizing security considerations while also considering mobility and accessibility needs.

The Policy Context

Impact of the Aspirational Initiatives

The encouragement of increased teleworking will help regional preparedness because telework plays an important role in "continuity of operations" of public and private-sector employers during emergencies, as demonstrated during the global pandemic.

Planning Factors

- Increase the safety of the transportation system for motorized and nonmotorized users.
- Increase the ability of the transportation system to support homeland security and to safeguard the personal security of all motorized and nonmotorized users.

RTPP Goals

- Maximize operational effectiveness and safety of the transportation system.


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Travel and Tourism

Tourism is one of the largest export sectors in the metropolitan Washington regional economy, accounting for $6.8 billion of the $27 billion total 2014 export value. The TPB has a long history of planning for a comprehensive range of transportation options to serve a diverse and robust economy of which the tourism industry is an important component. The TPB vision statement goals include providing real-time information about the transportation system that is "user-friendly for first-time visitor and residents, regardless of mode of travel or language of the traveler." The region's transportation infrastructure is a key element to the tourism economy. There are three major commercial airports, significant intercity rail/bus networks, as well as one of the largest rail/bus transit systems in the country.

While opportunities abound for aligning transportation planning efforts with a regional travel and tourism strategy to meet the transportation needs of the region's current and future tourism economy, numerous actions were taken to contain the pandemic spread of COVID-19 that have restricted socio-economic activities throughout the country, including the metropolitan Washington region. When comparing March 2020 to March 2021, employment data for the metropolitan Washington region shows the most significant job losses to be in hospitality, retail, and several service-related sectors. The transportation sector also experienced a significant downturn, especially regarding air travel and long-distance commutes, while bus usage remained significant, and a lifeline to front-line workers. Due to the robust role of tourism in the region and the strength of the U.S. Capital as a tourism destination, these short-term trends may not have long-term impacts.

Equity Considerations

Industries such as hospitality, retail, service-related sectors, and transportation, are primarily supported by low-wage workers, from cooks and waiters to cleaning and maintenance staff, to transit operators and more. Overall, the individuals who make up the metropolitan Washington region's travel and tourism economy reflect some of the populations hardest hit by the pandemic and most reliant on the region's public transportation system. Future planning efforts should consider strategies to provide the people that serve the tourism and travel industry with safe, efficient, and reliable multimodal travel options.

TPB's Role

Travel and tourism planning is generally overseen by the Regional Public Transportation Subcommittee (RPTS), whose mission is to provide a permanent process for coordinating public transportation planning throughout the metropolitan Washington region. However, over the past few decades, TPB and COG have laid the policy and research groundwork for regional travel and tourism planning. A 2016 TPB study, *Intercity Bus Traffic and Patronage in the Metropolitan Washington Region*, is the region's first known effort to quantify intercity bus ridership, where travelers board and alight, and origins and destinations outside of the region. A subsequent study examines fare and service equity in the region. The COG's *State of the Region: Economic Competitiveness Report* highlights some of the many regional attractions fueling growth in the National Capital Region's tourism industry, including the dozens of museums, embassies, and entertainment venues, combined with natural amenities such as major rivers

and almost 190,000 acres of parklands. This update to Visualize 2045 continues planning for travel and tourism, while acknowledging that the global pandemic has had a significant impact on travel and tourism in the region. While the short-term focus is recovery, long-term planning for regional connectivity and access continues.

Visualize the Future

Sponsors for projects in the constrained element identified 93 projects as supporting travel and tourism. Examples cited by the sponsors include Pennsylvania Avenue NW Protected Bicycle Lanes (CE3447), providing new travel options that will improve bicycle safety within and through the downtown core. In Frederick County, MD, the I-70/US 40 Corridor project (CE1187) will reduce travel times on this corridor. The segment has regional significance in providing the only interstate highway link between the Baltimore/Washington Region and points west to Pittsburgh, Cleveland, Detroit, and Chicago. In addition, it provides a vital link between the Port of Baltimore and its midwest markets, providing accessibility that enhances economic development and tourism in far western Maryland.

The TPB has the opportunity to develop a regional strategy for travel and tourism, although exact pathways still need to be determined. Additional studies and other coordinated efforts for developing a regional travel and tourism strategy could include conducting regional surveys on people traveling to the region for vacation purposes, which would collect key information regarding travel behavior as it pertains to tourism. This information could also provide additional relevant data to the TPB's travel demand model, which currently does not include external public transit trips.

Ongoing Challenges

The region prioritizes making the transportation system easy to use for everyone regardless of whether they live in the region or not, but there are still challenges. Having easy-to-understand signage on public transit, on roadways, and in airports is key, as well as providing information in multiple languages. Making travel affordable matters to visitors and residents alike. With so many jurisdictions in the National Capital Region. It can also be a challenge for users to understand the different transit systems and transfer between them. Developing a regional strategy that establishes the appropriate systems for effectively coordinating travel and tourism efforts across jurisdictional and agency boundaries will require significant cooperation and strategic planning.

The Policy Context

Impact of the Aspirational Initiatives

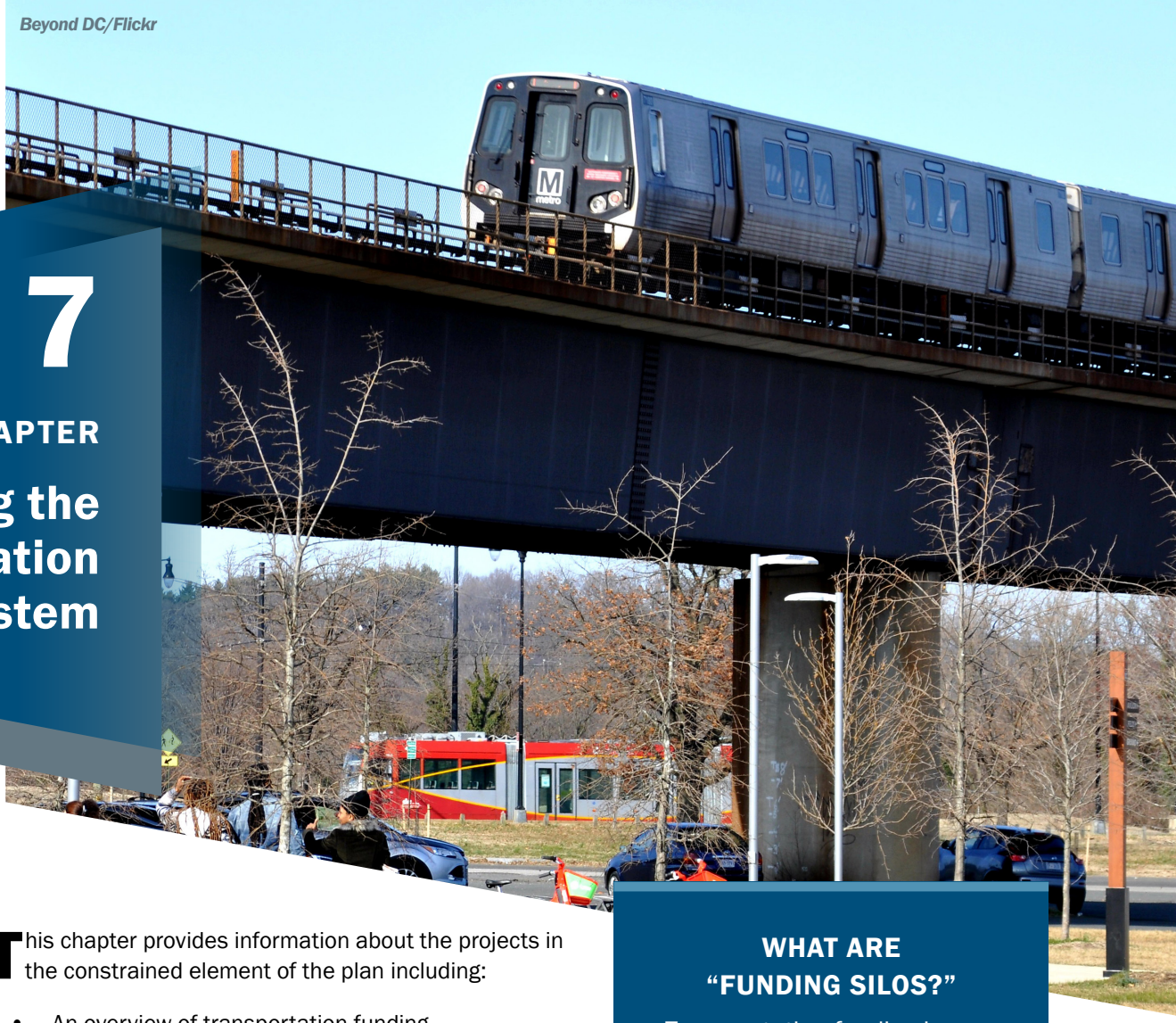
Metrorail core capacity improvements and expanding BRT in the region would provide more frequent and reliable public transportation, which is essential for providing a welcoming and efficient system to support travel and tourism. Bicycle and pedestrian improvements around transit stations will also encourage public transportation use among tourists.

Planning Factors

- Enhance travel and tourism.
- Support the economic vitality of the metropolitan area.
- Enhance the integration and connectivity of the transportation system across and between modes for people.

RTPP Goals

- Promote a strong regional economy, including a healthy regional core and dynamic Activity Centers.
- Support inter-regional and international travel and commerce.



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7

CHAPTER

Funding the Transportation System

This chapter provides information about the projects in the constrained element of the plan including:

- An overview of transportation funding.
- A summary of financial constraint and financial plan data.
- Lists and maps of the projects.
- A review of how the projects in the plan are advancing the TPB policy priorities, including the concepts called for in the seven endorsed Aspirational Initiatives, including a summary of responses to the regional policy questions that project sponsors completed for each project.
- A summary of responses to the federal policy questions that project sponsors completed for each project.

WHAT ARE "FUNDING SILOS?"

Transportation funding is not one "pot" of money that can be spent on any transportation project, program, or service. Federal and state laws and policies dictate where and how transportation funds can be applied, which separates the funding available into "silos."

In Chapter 8, Planning for Performance, learn more about the performance of the constrained element of the transportation system including performance-based planning and programming, the results of Air Quality Conformity analysis of the constrained element of the plan, and findings from the analysis which demonstrates the projected future performance of the transportation system in 2045.

How Do We Pay for Transportation?

Funding for the transportation system is provided by the federal, state, and local governments. But what is the source of funding? Generally, revenues for transportation are generated through a "user pay" system. Revenues typically come from sources such as fuel taxes, vehicle registration fees, transit fares, tolls, and other mechanisms, with additional revenues coming from general taxes.

In the metropolitan Washington region, state and local funding allocation to projects varies across jurisdictions. Federal funds are available through grants and specific funding programs. There is not one “pot” of funding. The available monies are typically allowed to be used for specific project types, such as maintenance, transit, enhanced mobility, safety, and other federal and state priorities. These different streams of funding are often called “funding silos.”

Does the Region Have Enough Funding?

As the metropolitan Washington region continues to grow in population and employment, new trips on all transportation modes are anticipated. While the LRTP includes continued capacity expansion, most of the increased travel demand will fall upon the existing highway and transit systems. Even with technological improvements and changes in trip demand (e.g., increased telework, home delivery, etc.), increases in travel congestion are predicted, with consequent impacts on quality of life. The predicted increases in congestion have been labeled unacceptable, however absent additional funding, current expansion plans for the region's transportation capacity will not match that anticipated growth, leading to travel demand further exceeding overall capacity.

Even with planned investments in transportation capacity, long-term performance analyses of past plans have predicted that travel congestion will increase significantly in future years, with the 2014 LRTP predicting an increase of 63 percent in congested lane miles (in the AM peak) by 2040, and the 2018 LRTP predicting growth of 43 percent by 2045.

Based on the forecasted results of the 2014 LRTP, the TPB asked staff to compile an unfunded capital needs inventory that would encompass transportation projects that have been included in the plans of TPB member jurisdictions and transportation agencies but have not been submitted for the LRTP due to lack of anticipated funding. The TPB staff issued a solicitation in early 2015 for project inputs for the inventory. This solicitation specified that submitted projects should: (a) affect regional travel and (b) be in state, local, and regionally approved plans, but (c) they should not currently be in the LRTP due to lack of anticipated funding.

The resulting All-Build scenario was a comprehensive inventory of unfunded capital needs, including all the major transportation projects in the plans of the TPB’s member jurisdictions even if those projects were not currently anticipated to be funded. The cost estimates

for construction of the additional new capacity in the All-Build Scenario ranged from $70 billion to $100 billion, an increase of 66 to 140 percent over planned investment in capacity expansion. Approximately $45 billion would be needed for new transit capacity, while the cost estimates for the new All-Build highway projects ranged from $25 to $55 billion. In comparison, new capacity in the 2014 LRTP was estimated at a total of $42 billion: $27 billion for roads and $15 billion for transit. The All-Build scenario also did not account for increased operating and maintenance costs, which would add to the price tag. Even with increase in capacity of the region's transportation system under the All-Build scenario, congestion in the AM peak was still predicted to grow by 32 percent by 2040.

In short, even if the region's transportation system was to receive significant additional funding for new capacity, traffic congestion is likely to grow absent significant lifestyle and policy changes. Transportation needs that are currently funded already consume a significant part of state and local government budgets. The region, its residents, and its businesses are left with a tradeoff between increased traffic congestion and funding new investments. This decision of investments to pursue will be determined by local policy choices over future years.

FEDERAL REQUIREMENTS

Federal regulations require the TPB to develop a long-range transportation plan identifying the projects expected to be funded within a minimum planning horizon of 20 years. The TPB must demonstrate that there is funding available for those projects. The total expenditures cannot exceed the total anticipated funding. The TPB must also analyze the plan for its effect on the region's air quality.

Demonstrating Financial Constraint

The Visualize 2045 update to the TPB's long-range transportation plan addresses the federal requirements for the process of developing the plan and the content that the plan must include. This includes developing a financial plan (Appendix A) and demonstrating "financial constraint." The TPB must demonstrate that it can reasonably expect revenues to fund construction of the major projects and maintain and operate the region's transportation system.[35] The financially constrained element of the Visualize 2045 update identifies all the regionally significant capital improvements to the region's highway and transit systems that transportation agencies expect to make and to be able to afford through 2045. It also outlines all anticipated spending on the current and future transportation system's operations and maintenance over the same timeframe. Any project that might affect future air quality by adding or removing highway or transit capacity is included in this portion of the plan.

There are three major types of projects and programs included in the financially constrained element. They are:

1. **System Expansion.** Projects that add new capacity by increasing the number of lane miles of roadway or by building new transit lines or adding service to existing lines.
2. **State of Good Repair.** Major rehabilitation or complete replacement of aging infrastructure, including bridges, transit vehicles, and technology and communications systems, as they near the end of their useful lifespan.
3. **Operations and Maintenance.** Day-to-day activities like repaving roadways, inspecting and maintaining bridges, clearing snow and debris, servicing transit vehicles, maintaining and operating traffic signals, and paying train and bus operators.

System expansion investments are detailed as specific projects in the plan. Anticipated investments in state

35 Because federal planning regulations require that the financial analysis show reasonably anticipated revenues and expenditures in year of expenditure (YOE) dollars, this report provides estimates in year of expenditure dollars. Year of expenditure dollars include inflation rates in the future years.

of good repair and operations and maintenance are discussed more generally. These investment details are included as part of the financial analysis of the plan (Appendix A).

Financial Plan Summary

The financial analysis of the Visualize 2045 update demonstrates that the region has forecast revenues which are reasonably expected to be available to cover the estimated costs of operating, adequately maintaining, and expanding the highway and transit system. This analysis is a required element of the TPB's long-range transportation plan. This section summarizes the full financial analysis that is provided in Appendix A: Financial Plan of Visualize 2045.

The financially constrained element of Visualize 2045 is fiscally realistic, balancing all proposed new project investments and system maintenance and operating costs with reasonable revenue expectations, as agreed upon by the TPB and its implementation agency partners in the metropolitan transportation planning process.

A total of $222.3 billion in transportation expenditures is projected for the metropolitan Washington region for the 23-year period of 2023 to 2045. The majority of future transportation revenues-81 percent-will be devoted to the operations and maintenance of the public transportation and highway systems. WMATA expenditures constitute 45 percent of revenues and other public transportation make up 22 percent of the total through 2045. Highways constitute 32 percent, and bicycle and pedestrian expenditures, 0.4 percent.

Funding for construction is identified for significant capital projects, including the K Street Transitway in the District of Columbia, the northern and southern segments of the I-270 and I-495 "Op Lanes," part of the statewide Maryland SHA Traffic Relief Plan, and implementation of the Transforming Rail initiative in Virginia. Importantly, the plan demonstrates full funding for WMATA's forecast needs for both operations and state of good repair through 2045.

Forecast Revenues

State DOTs, public transportation providers, other transportation agencies and jurisdictions, and the TPB cooperatively developed reasonable estimates of funds that will be available to support the implementation of the constrained element of Visualize 2045. More details can be found in Appendix A regarding the assumptions agencies made in developing the forecast revenues.

Ted/Flickr

The financial analysis summarizes the revenues (Figure 7.1) for the constrained element of the long-range transportation plan for the period 2023 through 2045. There are five sources of revenue: federal, state, regional/local, private/other, and fares/tolls.

Overall, federal revenue as a proportion of total revenue is 14 percent, while state (including the District of Columbia) sources are the largest single source at 55 percent. Local funds, which include funds collected across Northern Virginia, represent 13 percent of revenue. User fees from fares and tolls are 14 percent of the total revenues, while bonds, private, or other sources account for 3 percent of total revenues.

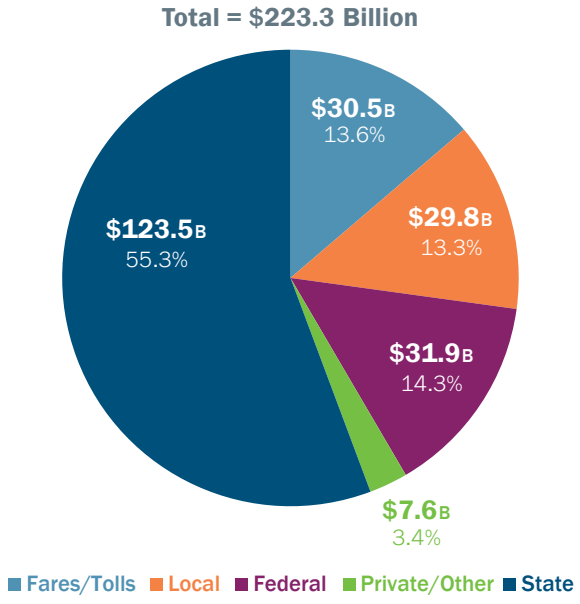
Forecast Expenditures

The financial analysis forecasts the costs of operating, maintaining, and expanding the transportation system (Figure 7.2). Notably, only a fraction of the funds is for expansion of the region's highway and transit systems; most expenditures are to operate and maintain the system and fund state of good repair projects to repair or replace infrastructure including highway bridges, transit vehicles, and other assets. There are three categories of expenditure: operations and maintenance, capital—state of good repair, and capital—expansion.

The financial analysis demonstrates that the region has reasonably expected funds for the projects in the constrained element of Visualize 2045.

Sixty-seven percent of expenditures are slated for public transportation, and 32 percent are slated for highways. Within the expenditures, operating the transportation system is forecasted to take up 53 percent, maintaining the system in a state-of-good repair is forecasted to

Figure 7.1: Revenues by Funding Source, Year of Expenditure Dollars [Billions] (Source: TPB Financial Analysis)



take up 28 percent, and expansion is the smallest portion, with 19 percent. While operating the system constitutes the largest portion of all transit expenditures: it constitutes the smallest portion of all highway expenditures.

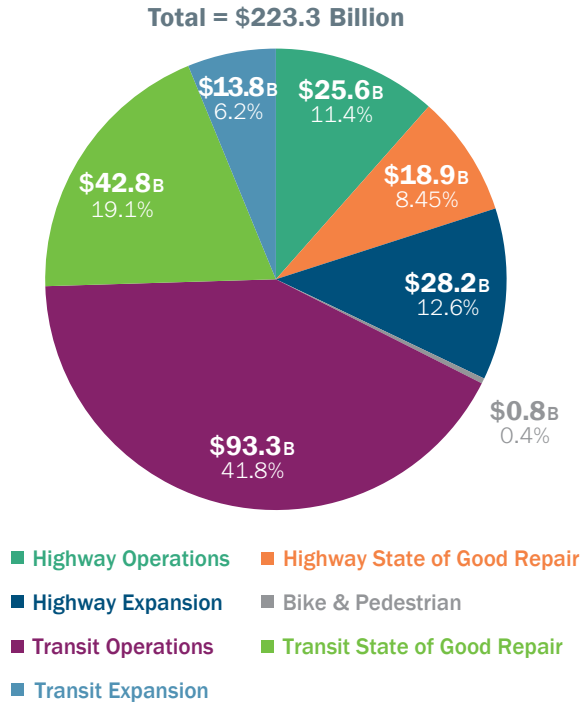
Together, balancing revenues and expenditures demonstrates fiscal constraint and the region's ability to pay for the long-range transportation plan.

Federal Programs

In November 2021, President Biden signed H.R. 3684, the Infrastructure Investment and Jobs Act (IIJA) into law. The IIJA is a sweeping $1.2 trillion infrastructure bill that reauthorizes the nation's surface transportation, drinking water, and wastewater legislation with significant additional funding for new programs in transportation, energy transmission, resilience, broadband, and many other sectors. Of the new funding above, the IIJA directs $284 billion towards all modes of transportation and $266 billion for other infrastructure sectors. The anticipated increase in federal transportation funds will increase funding for the District of Columbia, Maryland, and Virginia, which might lead to additional funding for the region. Funding estimates are likely to change as the programs are finalized and when 2020 census population data is used in apportionments. The IIJA also extends the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) through 2030. The IIJA provides $150M annually towards WMATA's Capital Program which is equally matched by the District of Columbia, Maryland and Virginia. The IIJA increases funding levels of several existing federal programs and establishes new programs focused on mitigating the effects of and building resiliency in face of climate change.

These funds may provide the opportunity for some projects in the plan to be accelerated and might enable more projects to be added to future plans. The funding does not alter the project list for this Visualize 2045 and its Air Quality Conformity analysis, as the project list was approved before the new bill was passed.

Figure 7.2: Expenditures by Type and Mode [Billions] (Source: TPB Financial Analysis)



Pom'/Flickr

Projects in the Financially Constrained Element

The following lists and maps highlight more than 100 of the major and regionally significant projects that provide for system expansion and changes in highway or transit capacity. Many of these projects have been previously approved; some are nearing completion. New or significantly changed projects are identified with bold text in the list on the following pages.

Table 7.1 shows the plan includes 893 new lane miles of roadway and more than 92 new miles of high-capacity transit. Appendix B: Summary of Projects in the Financially Constrained Element includes a comprehensive listing of all projects in the financially constrained element beyond those highlighted in this chapter along with their costs, completion dates, and links to further project information.

Costs identified include updated total project costs which may include additional elements presented in other list(s). Project costs are subject to change over time and as projects are refined. Please see Appendix B for the full list of projects and Appendix C for the detailed conformity inputs. **For details regarding the long-range transportation plan update and inputs to the Air Quality Conformity analysis, please visit the TPB website.**

Olaf Zerbock/Flickr

Table 7.1: Roadway and Transit Facilities added to the Transportation System (Source: TPB Travel Demand Model)

	System	Existing (2023)	Added by Visualize 2045 update	Total 2045
Roadway (Lane Miles)	Freeways/Expressways	3,802	682	4,484
	Arterials	13,479	211	13,690
	Total	**17,281**	**893**	**18,174**
Tolled Lanes (Lane Miles)*	**Total**	**532**	**221**	**753**
High-Capacity Transit (Miles)	Metrorail	129	0	129
	Light Rail/Streetcar	18	5	23
	Bus Rapid Transit	19	87	106
	Commuter/Regional Rail	173	**	173
	Total	**339**	**92**	**431**

* Tolled lanes are a subset of freeways/expressways

** An approximate additional 16 miles of rail are included in the plan, not presented in the table as they are not reflected in the model outputs.

Major Highway Projects

District of Columbia

Major Highways

1. I-295 (T5723): reconstruct interchange at Malcolm X Blvd, 2022 ***($215M)***

Local Roads

2. South Capitol St (T3423): convert to 6 lane Urban Blvd, incl. Frederick Douglass Bridge Reconstruction, 2025 ***($777M)***

3. Lane Reductions/ Reconfigurations for Bicycle Lanes: various years, *not mapped*

Maryland

Major Highways

4. I-70 (CE1187, CE2250): widen to 6 lanes with interchange at Meadow Rd, 2022, 2035 ***($176M)***

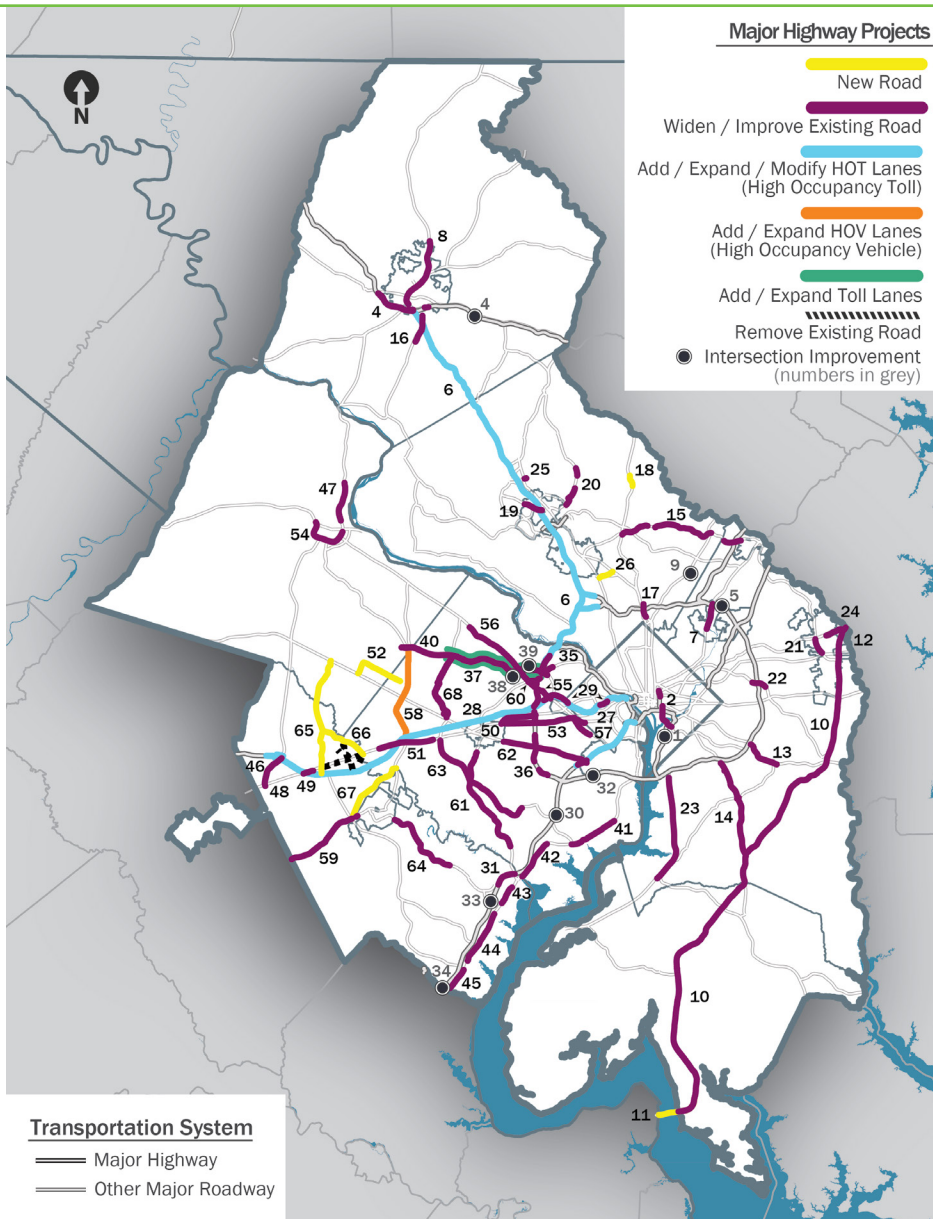
5. I-95/I-495 (T2894): interchange at Greenbelt Metro Station, 2030 ***($124M)***

6. I-270 (T6432, T11582, T11583): I-270, I-495 (T11582, T11583, T6432) bridge replacement and managed lanes construction, 2025, 2030 (study only for eastern section of I-495) ($3.97B)

7. US-1 (Baltimore Ave) (CE1202, T3108): reconstruct 4 lanes, 2023, 2035 ***($169M)***

8. US-15 (Frederick Fwy and Catoctin Mtn Hwy) (CE3566, CE3567): widen to 6 lanes with interchange at Biggs Ford Rd, 2030, 2040 ***($840M)***

9. US-29 (Columbia Pke) (CE1197, T3641): improve interchanges at Stewart Ln, Tech Rd/Industrial Pkwy, Musgrove Rd/Fairland Rd, Greencastle Rd, and Blackburn Rd, 2030, 2025, 2045 ***($738M)***



10. US-301 (Crain Hwy) (CE1004): widen to 6 lanes, 2045 ***($4.6B)***

11. US-301 (Governor Harry Nice 'Mac' Middleton Memorial Bridge) (T5527): replace with new 4-lane bridge, 2023 ***($636M)***

State Routes

12. MD-3 (Robert Crain Hwy) (T6394): widen to 6 lanes, 2035 ***($906M)***

13. MD-4 (Pennsylvania Ave) (CE1194, T3547): widen to 6 lanes with interchanges at Dowerhouse Rd, Westphalia Rd, and Suitland Pkwy, 2040 ***($750M)***

14. MD-5 (Branch Ave) (CE1196, T3469): upgrade, widen to 6 lanes including interchanges, 2030, 2035 ***($804M)***

15. MD-28 (Norbeck Rd) / MD-198 (Spencerville Rd) (T3476): reconstruct, widen portions to 4 lanes, 2045 ***($287M)***

16. MD-85 (Buckeystown Pke) (CE1210, T6483): widen to 4, 6 lanes, 2035 ***($230M)***

17. MD-97 (Georgia Ave) (CE2618): widen to 8 lanes, 2030 ***($104M)***

18. MD-97 (Brookeville Bypass) (T3106): construct 2 lane bypass, 2021 ***($44M)***

19. MD-117 (Clopper Rd) (CE1203): widen to 3, 4 lanes, 2030, 2035 ***($69M)***

20. MD-124 (Woodfield Rd) (CE3057): widen to 6 lanes, 2035 ***($120M)***

21. MD-197 (Collington Rd) (CE2253): widen to 4 lanes, 2030 ***($94M)***

22. MD-202 (Landover Rd) (CE1190): Largo Town Center Metro Access Improvement, reconstruct 6 lanes, 2045 ***($24M)***

23. MD-210 (Indian Head Hwy) (T6524, T4879): upgrade to 6 lanes and interchange improvement, 2040 ***($585M)***

24. MD-450 (Annapolis Rd) (CE1207): widen to 4 lanes, 2030 ***($67M)***

Local Roads

25. Middlebrook Rd Extended (CE1229): widen to 4 lanes, 2045 ***($16M)***

26. Montrose Pkwy East (T3703): construct 4 lanes, 2045 ***($120M)***

Virginia

Major Highways

27. I-66 HOT (Inside Beltway) (CE3484): revise operations from HOT 2+ to HOT 3+ during peak hours and bus service, 2022, 2040 ***($375M)***

28. I-66 HOT (Outside Beltway) (CE3448): widen/ construct HOT lanes and bus service, 2021, 2022, 2040 ***($4.4B)***

29. I-66 (CE3484): Extend existing westbound acceleration/deceleration lane and add additional lane eastbound 2022, 2040 ***($59M)***

30. I-95/Fairfax County Parkway (CE2668): enhanced interchanges for BRAC, 2025 ***($57M)***

31. I-95 (T6682): add southbound auxiliary lane, 2022 ***($32M)***

32. I-95/I-495 (CE2147): reconstruct interchange at Van Dorn St, 2030 ***($40M)***

33. I-95 (T11510): construct HOT reversible ramps to access VA-642 (Opitz Rd), 2022 ***($60M)***

34. I-95 (CE3556): construct HOT lanes ramp south of Russel Rd, 2022 ***($16M)***

35. I-495 (CE2069, CE3186, CE3208): construct 4 HOT lanes with northbound shoulder lane and new ramps and interchanges at VA 267, 2025, 2030, 2045 ***($570M)***

36. I-495 Auxiliary Lanes (CE3272): construct 2 auxiliary lanes in both directions, 2030 ***($3M)***

37. Dulles Toll Rd (VA-267) (CE3151, CE3154): East-bound and west-bound Collector-Distributor Roads, 2035, 2036, 2037 ***($186M)***

38. Dulles Toll Rd (VA-267) (CE3152): interchange at New Boone Blvd Extension, 2037 ***($79M)***

39. Dulles Toll Rd (VA-267) (CE3153): interchange at Greensboro Drive/Tyco Rd, 2036 ***($28M)***

40. Dulles Access Rd (VA 267) (CE1965): widen to 6 lanes including interchange reconstruct at I-495, 2030 ***($400M)***

41. US-1 (Richmond Hwy) (CE1942): widen to 6 lanes, 2028 ***($415M)***

42. US-1 (Richmond Hwy) (CE3180): widen to 6 lanes, 2035 ***($204M)***

43. US-1 (Richmond Hwy) (CE3173): widen to 6 lanes, 2022 ***($125M)***

44. US-1 (Richmond Hwy) (CE2594): widen to 6 lanes, 2030 ***($127M)***

45. US-1 (Richmond Hwy) (CE3291): widen to 6 lanes, 2040 ***($58M)***

46. US-15 (James Madison Hwy) (T6693): widen to 4 lanes, 2030 ***($45M)***

47. US-15 (James Madison Hwy) (CE1803): widen to 4 lanes, 2040 ***($54M)***

48. US-15 (James Madison Hwy) (CE3738): widen to 4 lanes, 2026 ***($111M)***

49. US-29 (Lee Hwy) (T4794): widen to 5 lanes, completed ***($212M)***

50. US-29 (Lee Hwy) (CE1933): widen to 6 lanes, 2040 ***($130M)***

51. US-29 (Lee Hwy) (CE3474): widen to 6 lanes, 2024 ***($86M)***

52. US-50 North Collector Rd (CE3739): construct new 4-lane road, 2029 *($110M)*

53. US-50 (Arlington Blvd) (CE2182): widen to 6 lanes, 2035 ***($249M)***

State Routes

54. VA-7/US-15 Bypass (Harry Byrd Hwy) (CE1870): upgrade and widen to 6 lanes, 2040 ***($55M)***

55. VA-7 (Leesburg Pke) (CE3161): widen to 6 lanes, 2030 ***($71M)***

56. VA-7 (Leesburg Pke) (CE2105): widen to 6, 8 lanes, 2024, 2030 ***($314M)***

57. VA-7 (Leesburg Pke) (CE2175): widen to 6 lanes, 2030 ***($34M)***

58. VA-28 (Sully Rd) (CE1734): widen to 8 to 10 lanes, HOV in additional lanes during peak, 2021, 2025, 2040 ***($100M)***

59. VA-28 (Nokesville Rd) (CE2045): widen to 4 or 6 lanes, 2022, 2040 ***($71M)***

60. VA-123 (Chain Bridge Rd) (CE3376, CE3698): widen to 6, 8 lanes, 2030 ***($22M)***

61. VA-123 (Ox Rd) (CE1784, CE1856): widen to 6 lanes, 2030 ***($70M)***

62. VA-236 (Little River Tpke) (CE1760): widen to 6 lanes, 2030 ***($58M)***

63. VA-286 (Fairfax County Pkwy) (CE2106, T6694): widen to 6 lanes, 2030, 2035, 2040 ***($198M)***

64. VA-294 (Prince William Pkwy) (CE2718): widen to 6 lanes, 2040 ***($263M)***

65. Manassas Bypass (VA-234 Bypass) (CE1897): construct 4 lanes, 2040 ***(costs captured in other projects)***

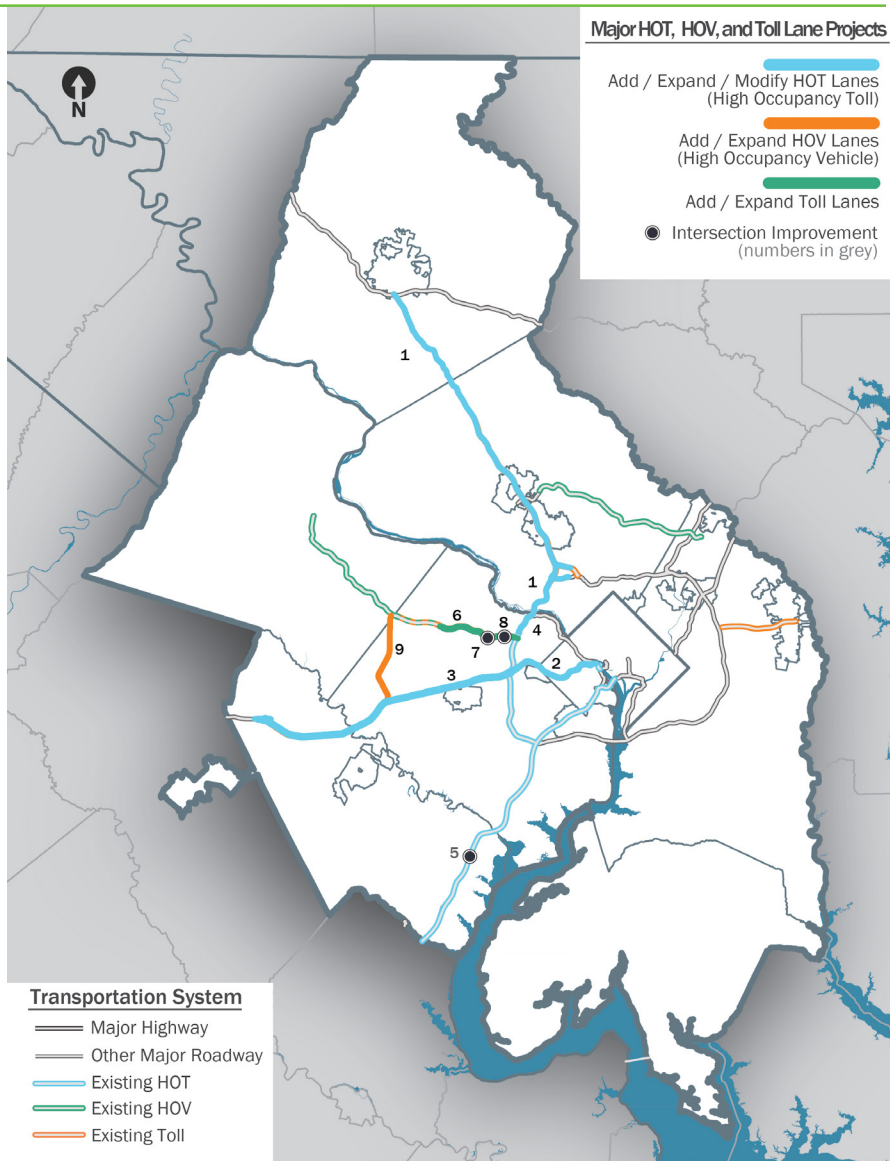
66. Manassas Battlefield Bypass (CE3061): construct 4 lanes and close portions of US-29 (Lee Hwy) and VA-234 (Sudley Rd), 2030, 2040 ***($28M)***

67. VA 28 Manassas Bypass (CE1865): construct 4 lanes, 2025 ***($228M)***

MDOT/Flickr

Major HOT, HOV, and Toll Lane Projects*

*** HOT = High-Occupancy Toll Lanes. HOV = High-Occupancy Vehicle Lanes** *The projects and costs shown on this page are redundant to those included in the Highway Projects list on the previous pages.*



Maryland

Major Highways

1. I-270 and I-495 (T6432): bridge replacement and managed lanes construction, 2025, 2030 (study only for eastern section of I-495) ***($3.4B)***

Virginia

Major Highways

2. I-66 HOT (Inside Beltway) (CE2096, CE3484): revise operations from HOT 2+ to HOT 3+ during peak hours and bus service, 2022, 2040 ***($375M)***

3. I-66 HOT (Outside Beltway) (CE3448): widen/construct HOT lanes and bus service, 2021, 2022, 2040 ***($4.4B)***

4. I-495 (CE2069): construct 4 HOT lanes, 2025 ***($500M)***

5. I-95 (CE3697): construct HOT reversible ramps to access VA-642 (Opitz Rd), 2022 ***($60M)***

6. Dulles Toll Rd (VA-267) (CE3151, CE3154): Collector-Distributor Rd west-bound, 2035, 2037 ***($62M)***

7. Dulles Toll Rd (VA-267) (CE3151, CE3154): Collector-Distributor Rd east-bound, 2035, 2036 ***($124M)***

8. Dulles Toll Rd (VA-267) (CE3152): interchange at New Boone Blvd Extension, 2037 ***($79M)***

9. Dulles Toll Rd (VA-267) (CE3153): interchange at Greensboro Dr/Tyco Rd, 2036 ***($28M)***

State Routes

10. VA-28 (Sully Rd) HOV (CE1734): widen to 8-10 lanes, HOV in additional lanes during peak, 2021, 2025, 2040 ***($100M)***

Major Transit Projects

District of Columbia

1. DC Streetcar (CE3081,5754): 2026, 2040 ***($545M)***

2. DC Dedicated Bicycle Lane Network: various years, *not mapped* ***($800K)***

3. 16th St Bus Priority Improvements (6638): 2022 ***($2M)***

4. DDOT H and I street Bus-Only Lanes (part of T3212): *($1.1 M)*

Maryland

5. Corridor Cities Transitway BRT (CE1649): from Shady Grove to COMSAT, 2035 ***($545M)***

6. North Bethesda Transitway BRT (CE3663): from Montgomery Mall to White Flint Metro, 2035 ***($115M)***

7. Veirs Mill Rd BRT (CE3103): from Wheaton Metro to Rockville Metro, 2030 ***($82M)***

8. Randolph Rd BRT (CE3662): from US-29 to MD-355, 2040 ***($102M)***

9. New Hampshire Ave. BRT (CE3672): from Takoma Metro to Colesville P&R, 2045 ***($285M)***

10. MD-355 BRT (T6396): from Bethesda Metro to Clarksburg, 2030 ***($1B)***

11. MARC (CE3427): increase trip capacity and frequency along all commuter rail lines, 2029 ***($1B)***

12. Purple Line (CE2795): Bethesda to New Carrollton, 2023 ***($2.7B)***

Virginia

13. Crystal City Transitway Northern and Southern Ext BRT (CE3521, CE3648): 2022, 2025, 2030 ***($52M)***

14. Metro Silver Line (Dulles Corridor Metrorail Project) (CE1981): Phase 2, 2022 ***($2.9B)***

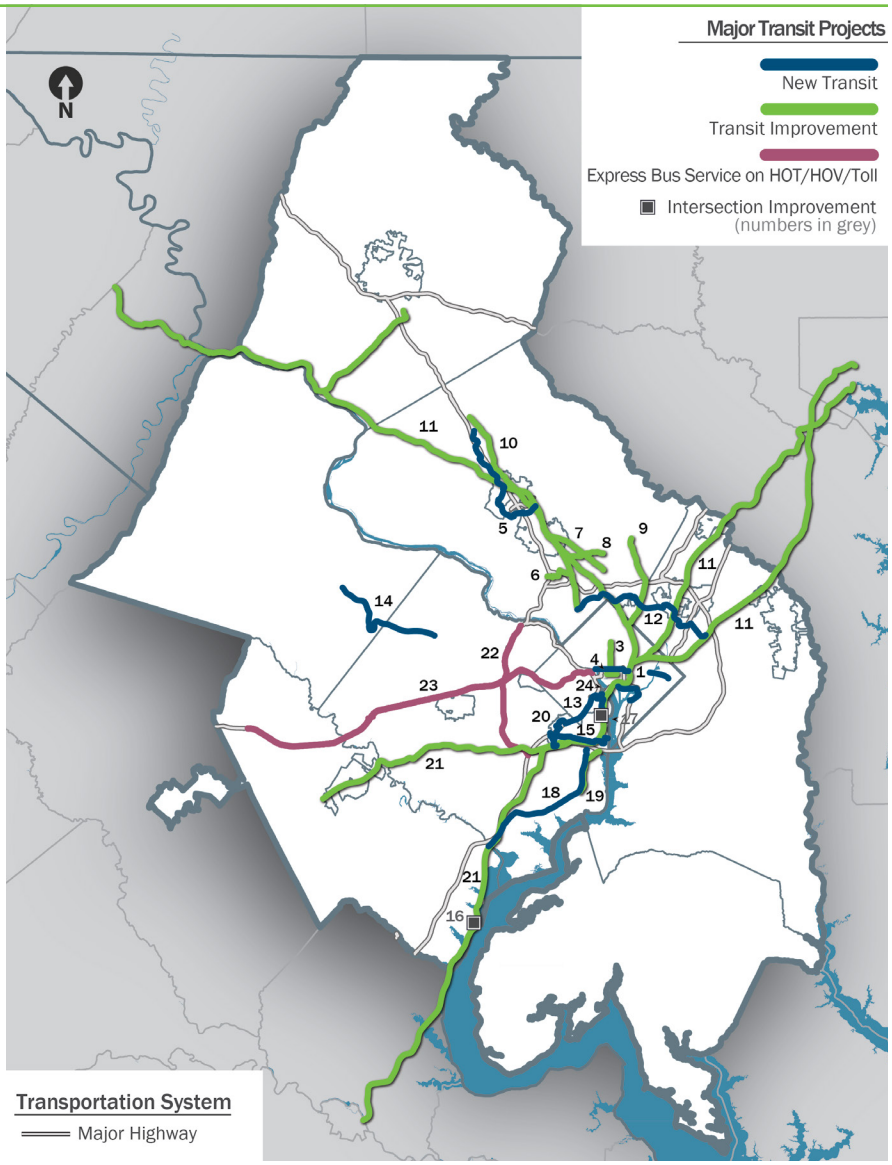
15. Duke St Transitway (CE2932): King St Metro to Fairfax County line, 2027 ***($19M)***

16. Potomac Shores VRE Station (CE2831): 2022 ***($26M)***

17. Potomac Yard Metro Station (CE3013): 2022 ***($268M)***

18. US-1 BRT from Huntington Metro Station to Woodbridge (T6680): 2030 ***($504M)***

19. US-1 bus lanes and improved intersections (CE1942): 2035 ***($37M)***



20. West End Transitway (CE2930): Van Dorn St Metro to Pentagon Metro and to Landmark, 2026, 2035 ***($420M)***

21. VRE (CE2832, CE2420): 3rd and 4th track projects to reduce headways along the Manassas and Fredericksburg Lines, 2025, 2028, 2035 ***($105M)***

22. I-495 HOT Lane Express Bus Service: 2030 ***($254M)***

23. I-66 HOT Lane Enhanced Bus Service (CE3484, CE3448): 2025, 2040 ***($375M)***

24. Additional Long Bridge (T6727): railroad crossing with two-tracks and pedestrian/bike access, 2027 ***($1.9B)***

Tracking Progress: The Financially Constrained Element and Policy Priorities

Projects that address the TPB's goals and Aspirational Initiatives, and the Federal Planning Factors

There are more than 400 projects in the constrained element project list. Tables 7.2–7.9 provide a summary of how the projects enhance, promote, or support each RTPP transportation goal, Aspirational Initiative, and federal planning factor. This section also provides examples of the constrained element projects that align with the TPB's endorsed Aspirational Initiatives.

This summary is compiled from information provided by each project sponsor in response to questions in the 2020 **Technical Inputs Solicitation**. The total number of projects that support each goal area is based on the information that project sponsors submit. For example, in response to Goal 1 (Table 7.2), project sponsors noted that 195 projects promote, support, or enhance transportation for local bus.

Some projects could be a subcomponent of a larger project. As many projects have numerous components, such as roadway, transit, bicycle/pedestrian and safety components, each project might enhance, promote, or support more than one transportation option or planning priority. The solicitation also asked project sponsors to provide narrative responses as to how equity is considered in planning, if and how projects mitigates greenhouse gas emissions, and how projects advance the Aspirational Initiatives and TPB goals. **For the complete narrative responses for each project as provided by the agencies, please visit the Visualize 2045 website.**

NRC/Flickr

Regional Transportation Priorities Plan (RTPP) Goals

Jeff Vincent/Flickr

Goal 1: Provide a Comprehensive Range of Transportation Options

Having more transportation options to choose from makes it easier for people to find the travel modes that works best for them in meeting their daily needs. The table below summarizes the number of projects that support the different options available in the region. It also includes a category specific to improving accessibility for disadvantaged groups and their transportation needs.

Table 7.2: Goal 1 — Project Sponsor Responses

GOAL 1	95 NON-AUTO TRAVEL/ REDUCE VMT	243 SOV	74 HOV	67 METRORAIL	30 COMMUTER RAIL	9 STREETCAR/ LIGHT RAIL	35 BRT
	EXPRESS/ COMMUTER BUS 92	METROBUS 102	LOCAL BUS 195	BICYCLING 205	WALKING 211	OTHER 6	DISADVANTAGED GROUPS 61

Goal 2: Promote a Strong Regional Economy, Including a Healthy Regional Core and Dynamic Activity Centers


Evert Barnes/Flickr

The region's economy is supported largely by the economic activity that occurs in major housing and job centers, known as Activity Centers. Strengthening these areas, including the regional core, and connecting them with good transportation options bolsters the economy. It allows the region to grow and use land more wisely, and creates numerous opportunities to move people and goods more efficiently and with a lower carbon footprint. Respondents for each of the projects were asked about the project area and overlap with Activity Centers and Equity Emphasis Areas (EEAs), which are areas with significant concentrations of low-income households, concentrations of minority populations, or both.

Table 7.3: Goal 2 — Project Sponsor Responses

GOAL 2	109 IN EQUITY EMPHASIS AREA	196 BEGIN/END IN ACTIVITY CENTERS	117 CONNECT ACTIVITY CENTERS	137 NON-AUTO WITHIN ACTIVITY CENTERS	129 CONNECT EQUITY EMPHASIS AREAS TO ACTIVITY CENTERS

Goal 3: Ensure Adequate System Maintenance, Preservation, and Safety

Keeping the region's extensive transportation system in a state of good repair is crucial to ensuring reliability and safety. Maintaining existing infrastructure results in better system performance and significant savings in the long-run. System maintenance and preservation requires about 28 percent of the region's transportation funds. Respondents indicated that 115 projects contribute to enhanced system maintenance or preservation.

Table 7.4: Goal 3 – Project Sponsor Responses

Goal 4: Maximize Operational Effectiveness and Safety of the Transportation System

To maximize system effectiveness and safety of the existing transportation network, the region needs to utilize available technologies, techniques, and programs. Rapid growth and limited financial resources make it especially important to maximize system efficiency. The solicitation asked project sponsors if the projects would reduce travel time on highways and/or transit without building new capacity and if the project is expected to significantly reduce fatalities or injuries.

Table 7.5: Goal 4 – Project Sponsor Responses

Goal 5: Enhance Environmental Quality, and Protect Natural and Cultural Resources

An effective transportation system needs to balance the mobility needs of a growing region with the potentially harmful effects that travel by car and other modes may have on the environment and health of residents. This goal monitors the environmental impact that projects may have through criteria pollutants and greenhouse gas emissions. Learn more about environmental consultation and mitigation in Chapter 6 and through the **TPB's interactive map**.

Table 7.6: Goal 5 — Project Sponsor Responses

GOAL 5	
171	REDUCTION IN CRITERIA POLLUTANT EMISSIONS
185	REDUCTION IN GREENHOUSE GAS EMISSIONS

Goal 6: Support Inter-Regional and International Travel and Commerce

The region strives to be among the most accessible in the nation for inter-regional and international passenger and goods movement. Providing strong passenger and freight connections by air, highway, rail, and sea brings economic benefits to our region. This table summarizes the number of projects that enhance, support, or promote those freight and passenger carrier modes.

Table 7.7: Goal 6 — Project Sponsor Responses

GOAL 6							
58	162	8	17	24	14	36	
LONG-HAUL TRUCK	LOCAL DELIVERY	FREIGHT RAIL	FREIGHT AIR	AIR PASSENGER	AMTRAK	INTERCITY BUS	

Elvert Barnes/Flickr

Aspirational Initiatives

The Visualize 2045 update calls upon local jurisdictions and funding agencies to implement projects, programs, and policies in line with the seven Aspirational Initiatives described in Chapter 6. The TPB believes that the anticipated growth in travel demand calls for increasing and accelerated investment in projects, programs, and policies in line with the initiatives to help the region attain its transportation goals. Across the region, TPB member jurisdictions and agencies are planning and implementing these initiatives, some of which must be included in the constrained element. To be included in the constrained element, projects must be funded and meet other criteria (see Chapter 1). The narrative in this section provides examples of projects in the financially constrained element, illustrating progress on the region's aspirations. Table 7.8 provides a count of the projects in the constrained element and their connection to the endorsed initiatives.

As noted above, localities and funding agencies were asked to align their projects to the Aspirational Initiatives. During the data collection process, they were asked if each of the projects support or advance each of the initiatives and to provide additional written information describing how.

Table 7.8: Aspirational Initiatives — Project Sponsor Responses

127	47	48	42	32	162	36
BRING JOBS AND HOUSING CLOSER TOGETHER	EXPAND BRT AND TRANSITWAYS REGIONWIDE	MOVE MORE PEOPLE ON METRORAIL	PROVIDE MORE TELECOMMUTING AND OTHER OPTIONS FOR COMMUTING	EXPAND EXPRESS HIGHWAY NETWORK	IMPROVE WALK AND BIKE ACCESS TO TRANSIT	COMPLETE THE NATIONAL CAPITAL TRAIL NETWORK

Bring Jobs and Housing Closer Together by adding housing, and concentrating more housing and jobs in central locations such as Activity Centers and near high-capacity transit station areas. Specific consideration ought to be given to Equity Emphasis Areas to make it possible for more people of all incomes to live near employment and other frequent destinations. This initiative brings together the most effective strategies for transportation and land-use planning, which can make it possible for people to make shorter trips and fewer single-occupant auto trips, as people will be able to choose from a range of travel options (see the infographic, page 84). The region is responding to this initiative through the COG Housing Initiative described in the land-use section of Chapter 6. While specific land-use projects are not detailed in the constrained element, COG's Cooperative Forecast of Population, Households, and Employment is used as the basis for TPB modeling for system performance in 2045 (see Chapter 8). About 80 percent of land use documented in the Cooperative Forecast is already in place. The forecast projects that much of the new housing and jobs in the region will be located in regional Activity Centers. Many projects in the constrained element represented by the other initiatives help to connect Activity Centers through a range of travel options including high-capacity transit. Examples include Embark Richmond Highway (US-1) in Fairfax County (T6680), which includes plans for complementary new development and rapid transit.

A project on the US 15/US 40 Corridor (CE3566) in Frederick County will improve the network, providing commuters with safe and reliable travel. The project, Silver Line - Phase 2 (CE1981), catalyzes and will serve new transit-oriented development that provides additional housing near jobs in northern Virginia. To implement the Woodbridge, VA, transit-oriented development near a VRE station, a project called Marina Way Extended (CE3756) will construct a boulevard section with pedestrian facilities on both sides of the roadway to encourage nonmotorized transportation.

Joe Flood/Flickr

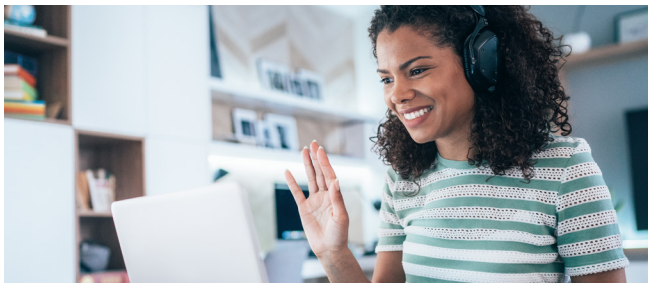
Expand Bus Rapid Transit and Transitways throughout the region to provide people not only more transit options but also a reliable and fast bus service for work and non-work trips (see the infographic on page 89). The financially constrained element includes five new bus rapid transit (BRT) routes in Montgomery County, MD (CE3663, CE3103, CE3662, CE3672, T6396). These routes on Veirs Mill Road, Randolph Road, New Hampshire Avenue, and other roads reflect many of the key BRT characteristics to enhance reliability and reduce travel time. The constrained element also includes the Crystal City Transitway BRT expansion (CE3521, CE3648). This project expands upon the existing Metroway system and results in a route which will run partially on an exclusive right-of-way. Other BRT in the plan includes the Corridor Cities Transitway BRT (CE1649) in Maryland and the Route 1 Richmond Highway BRT (T6680) in Virginia, both of which will run in exclusive rights-of-way. As agencies typically need to retrofit these projects into existing roadways, there are at times compromises made to implement a project, such as operating in dedicated rights-of-way for part, not all of the trip, or transitioning to off-board payment when feasible.

Beyond DC/Flickr

There are other transitway projects in the constrained element that provide people with more transit options or improve reliability and service. The 16th Street Bus Priority Improvements (T6638) project in DC will add bus lanes on a major bus route which will increase the speed and reliability of bus lines that are utilized by thousands of riders every day. The H&I Street Bus-Only Lanes (part of T3212) will provide increased reliability in transit options for commuting to and through DC's downtown core. The US-1 bus lanes project (CE1942) widens an additional lane in each direction from VA 235 north to the Capital Beltway. During peak periods, these lanes will be reserved for use by buses.

Elvert Barnes/Flickr

Move More People on Metrorail. The initiative calls for other capacity improvements to Metrorail, to move more people by providing more frequent services with longer trains and expanded stations that are accessible by nonmotorized modes. The financially constrained element includes new 8-car trains as well as the completion of the Silver Line. The Silver Line-Phase 2 Metrorail Project (CE1981) expands capacity on Metrorail by extending the Orange Line in Fairfax County and adds new stations. Another Metrorail improvement is the new Potomac Yard station in Alexandria, VA, serving the Blue and Yellow Lines (CE1978).



Provide More Telecommuting and Other Options for Commuting to take advantage of the many jobs suitable for teleworking, provide employees with transit and nonmotorized travel benefits, and disincentivize commute parking. The financially constrained element of Visualize 2045 includes funding for travel demand management programs such as the TPB's Commuter Connections program. Such programs encourage and incentivize telework and transit use through employer-provided subsidies, among other actions. They help push the region to more rapidly adopt alternative transportation strategies to reduce vehicle miles traveled and relieve congestion.

When considering other options for commuting, this initiative also calls for reducing solo car trips. Example projects include the Pennsylvania Avenue SE project (CE3654) in the District of Columbia which will build bike lanes past the Eastern Market Metro Station and provide cyclist access to the Anacostia River and Metropolitan Branch trail. In Dumfries, VA, agencies are expanding intercity passenger rail service by constructing the VRE Potomac Shores station (CE2831) which includes the Arkendale to Powells Creek Third Track project.

Expand the Express Highway Network strategically, in an environmentally sensitive manner, to create a network that connects much of the region, featuring express bus systems and allowing carpools and vanpools to be exempt from tolls.

Visualize 2045's financially constrained element includes several major projects that support this initiative: High-Occupancy Toll (HOT) lanes on the northern portion of I-495 in Virginia (CE2069). This project includes express toll lanes with toll-free travel for high-occupancy vehicles. Express bus service will also run on the express lanes. There are also HOT lane ramp projects on I-95 including Opitz Road (CE3697) and Russel Road (CE3556). The project list also includes adding dynamically-priced toll lanes along I-495 in Maryland on which carpool/vanpools of three or more occupants will ride free and I-270 (T6432).

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Improve Walk and Bike Access to Transit. Removing barriers to walking and biking to transit helps to fully utilize the investments already made in transit by encouraging more people to ride. An example of a project in the financially constrained element that improves transit access is the Old Cameron Run Trail project (CE3618) in the City of Alexandria that supports improved walk and bike access to the Eisenhower Avenue Metrorail Station. This project will complete a segment of the National Capital Trail Network. Also, expanding the network of dedicated bicycle lanes in the District of Columbia will allow more people to bicycle for their daily trips and connect to Metro and other transit options. The East Capitol Street Corridor Mobility and Safety Plan (T6315) in Ward 7 will improve pedestrian and bicycle mobility to Metrorail stations and bus stops.

Many bicycle and pedestrian improvements that are documented in the **TPB Bicycle & Pedestrian Plan** are not included in the financially constrained portion of the region's long-range transportation plan because they are typically not large enough to be considered "regionally significant" to impact the Air Quality Conformity analysis. Such improvements are often incorporated into roadway or transit projects of the plan but are not necessarily referenced in project titles. However, Visualize 2045 calls attention to other ways that the TPB promotes and supports improvement of walk and bike access to transit.

Complete the National Capital Trail Network to create an extensive network of trails that provides walk and bicycle access to jobs and other activities by connecting communities across the region to Activity Centers. Most of the upgrades to existing trails and new trails that need to be built to complete the National Capital Trail Network do not meet the requirements for inclusion in the constrained element of Visualize 2045 because the trails will not significantly impact Air Quality Conformity.

However, some pieces of the National Capital Trail Network are associated with other projects in the financially constrained element of the plan – once the Purple Line is completed, the portion of the National Capital Trail Network between Bethesda and Silver Spring will be vastly improved. The South Capitol Street Trail project in the District of Columbia (T6114) will construct a paved bicycle and pedestrian trail along the street. It is one of the biggest missing links in the National Capital Trail Network that will connect the Anacostia River Trail and Frederick Douglass Memorial Bridge with the Woodrow Wilson Bridge, National Harbor, and Mount Vernon Trail. As part of the VA Route 123 widening (CE1784) in Prince William County, there are planned segments of pedestrian and bicycle facilities along segments of the trail.

Federal Planning Factors

The states and MPOs are required to consider the federal planning factors of MAP-21 and the FAST Act. The following table notes how many projects align with each of these factors. The solicitation asked project sponsors which factors their projects support. For example, 314 projects support economic vitality, according to project sponsor responses.

Table 7.9: Federal Planning Factors — Project Sponsor Responses

314 ECONOMIC VITALITY	277 SAFETY	142 HOMELAND SECURITY	315 ACCESSIBILITY/ MOBILITY PEOPLE	185 ACCESSIBILITY/ MOBILITY FREIGHT	209 ENVIRONMENT
INTEGRATION/ CONNECTIVITY 257	MANAGEMENT AND OPERATION 239	PRESERVATION 131	RESILIENCY AND STORMWATER IMPACT 93	TOURISM 93	

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8

CHAPTER

Planning for Performance

Planning, Evaluating and Forecasting Performance

Sports fans know that metrics are used by athletes and teams in the pursuit of improved performance. Transportation planning also uses analysis of performance measures to strive for better outcomes. Through performance planning, the TPB informs decision-making on how the region's transportation system will be managed, operated and invested in. The TPB works with partners to compile regional transportation data and evaluates the performance of how all the elements of the regional transportation system work together.

This chapter reports the TPB's planning for performance and demonstrates how that is documented through and meets the requirements of federal **Performance-Based Planning and Programming (PBPP)** and the **Congestion Management Process (CMP)**.

WHY MEASURE PERFORMANCE?

The TPB uses performance measures to monitor transportation trends and the impacts of investments on transportation performance. Implementing agencies respond to trends to improve performance of the transportation system. This provides a better return on investment of every taxpayer dollar and means better experiences for the people and businesses that rely on the transportation system.

PERFORMANCE-BASED PLANNING AND PROGRAMMING

A federally mandated process calling for states and MPOs to "transition to a performance-driven, outcome-based program that provides for a greater level of transparency and accountability, improved project decision-making, and more efficient investment of federal transportation funds."

This chapter reports three sets of measures:

1. The federally required regional performance measures established and reported as part of the PBPP process.
2. The Air Quality Conformity analysis measures, with forecasts based on the projects included in the constrained element.
3. The measures that TPB uses to report on performance of the regional transportation system, for current and forecasted performance, based on the projects included in the constrained element.

A Performance-Based Approach: PBPP and the CMP

The TPB and its partner agencies have a long tradition of using performance measures to inform planning and investments, and to evaluate the regional transportation system. Building upon that tradition, federal PBPP requirements originating in the federal surface transportation Moving Ahead for Progress in the 21st Century Act (MAP-21), and Fixing America's Surface Transportation (FAST) Acts, formalized that approach. They call for state departments of transportation (DOTs), providers of public transportation, and metropolitan planning organizations (MPOs, such as the TPB), to document how they link investment priorities to the achievement of performance targets. This includes the projects in Visualize 2045 and the TIP.

The TPB has a longstanding commitment to safety, managing congestion, providing transportation demand management through a comprehensive transportation system, and prioritizing the preservation of that system. This is enhanced by and documented through the PBPP and the CMP. These approaches provide a framework that links investments in programs, policies, and projects with desired outcomes for transportation system performance.

PBPP is comprised of a range of activities and products that TPB and partners must undertake, including:

- Reporting on PBPP in the development of long-range transportation plans.
- Reflecting PBPP in programming documents, including State and metropolitan Transportation Improvement Programs (STIPs and TIPs).
- Producing federally required plans and processes such as the CMP, Strategic Highway Safety Plans (SHSPs), Asset Management Plans, and Transit Agency Asset Management and Safety Plans.

Learn more about the TPB's PBPP performance measures and progress in this chapter, and in the Systems Performance Report, Appendix D of this plan.


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Congestion Management Process (CMP)

Every day, millions of people travel on our region's roads to access jobs, schools, and medical care, as well as shopping, entertainment, and recreational opportunities. Roads also carry most goods deliveries to homes, schools, businesses, and stores in the region. When roads are congested, that means people spend more time in traffic and less time doing the activities and being with the people that are important to them.

Congestion means people must make costly tradeoffs, such as leaving home early to get to work or leaving work early to get to day care. It means higher costs for business to move goods and provide services. In the greater metropolitan Washington region,[36] in 2019, roadway users were estimated to spend more than 256 thousand hours stuck on the roads due to delay from congestion, averaging to 105 hours per commuter. The economic cost of this congestion was estimated at more than $5.4 billion, or about $2,200 per commuter per year. This leads to an excess of fuel consumed in the amount of more than 98 million gallons, leading to an additional 975,000 tons of carbon (greenhouse gases) emitted into the air.[37]

TPB's Role

Due to population and economic growth, congestion is forecasted to increase. The TPB must continuously plan to move more people and goods through multimodal strategies and efficient management and operation of the system. For decades, the TPB has conducted planning for the region's extensive highway and road network that provides connectivity for people and goods to destinations across the region.

The TPB serves in an important role addressing congestion and providing for safe and effective management and operation of the transportation system in the region. As depicted in Figure 8.1, it does this by conducting analyses and providing information for members' awareness of congestion trends and potential management strategies which are documented in the federally required CMP. The TPB's activities are documented as four major CMP components that are integral to the region's LRTP, as summarized in Table 8.1. The TPB's activities that are documented in the

Voices of the Region

A FEW KEY SURVEY RESULTS:

How big a concern is traffic congestion to you, personally?

The responses varied significantly based on where people lived, underscoring the impact that land use and the provision of multiple transportation options have on the consumer experience:

54% of people living in more suburban areas indicated that "*congestion is a significant concern and it impacts the quality of my life,*" compared to 46% in the inner suburbs, and only 27% of those in the core (more urban areas with more transportation options).

36 Note the estimates provided by TTI are for a geographical area slightly different from the TPB planning area.

37 Retrieved online from: Texas A&M Transportation Institute (TTI) 2019 Urban Mobility Report: mobility.tamu.edu/umr/congestion-data

CMP FEDERAL REQUIREMENTS

Federal law requires the TPB to provide for "safe and effective integrated management and operation of the multimodal transportation system...through the use of travel demand reduction and operational management strategies."

CMP include regional consensus building and participation in several forums for coordination and information sharing. The TPB Technical Committee, the Systems Performance, Operations, and Technology Subcommittee, and the Commuter Connections Subcommittee consult regularly on staff's work. The TPB's Commuter Connections program plays a critical role in implementing the most impactful strategies for demand management. Demand management seeks to reduce congestion by reducing the number of vehicles (especially single occupant vehicles) on the road during high-volume time periods while operational management focuses on incident management, technology advances, and, when necessary, capacity increases. **Further information on the CMP can be found online** and in Appendix E: Congestion Management Process Federal Compliance and Impact on Plan Development.

Figure 8.1: Visualize 2045 and the CMP

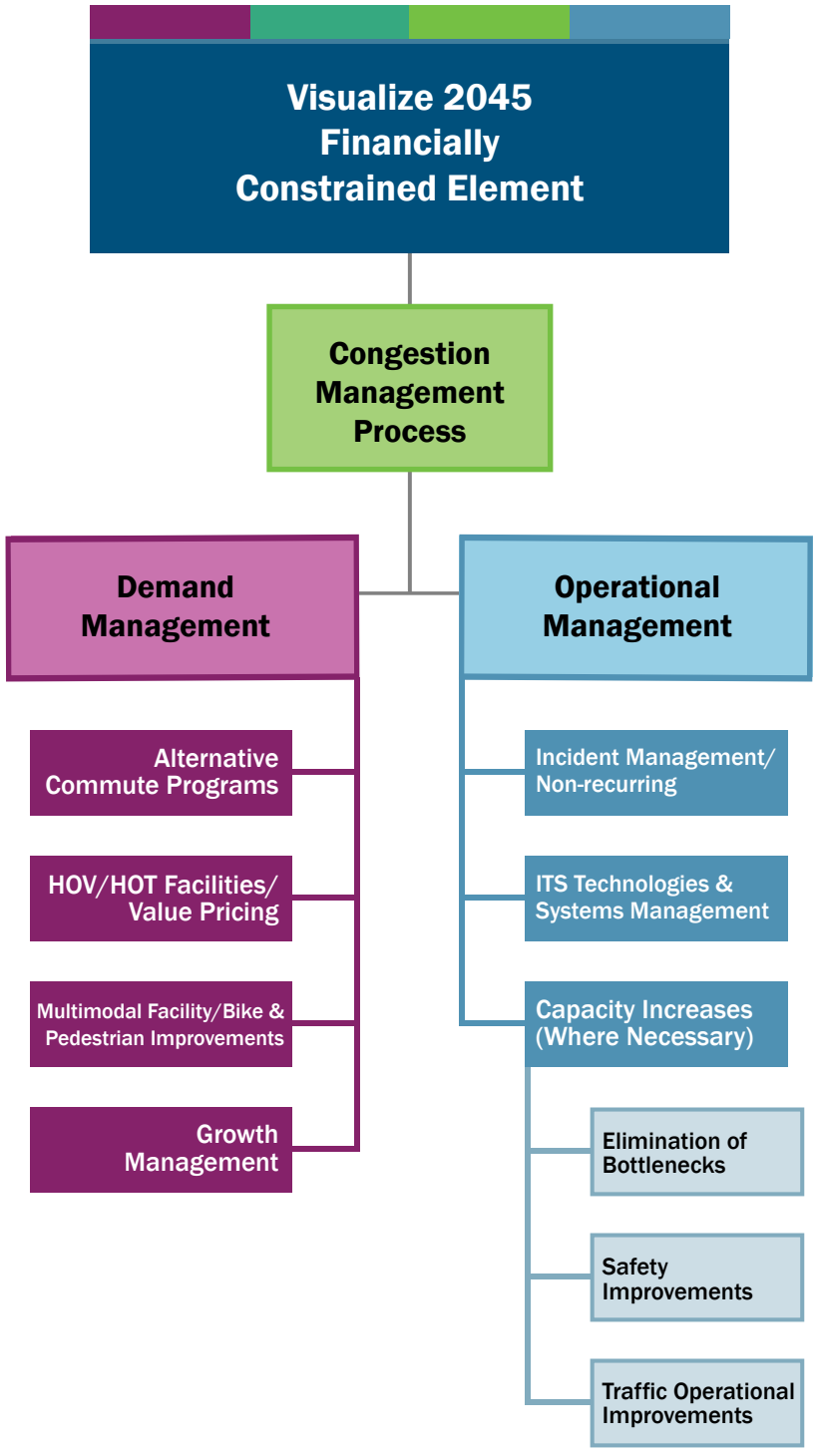

Table 8.1: Visualize 2045 and CMP Components

Component	TPB Role	CMP Documentation
1. Monitoring and evaluating transportation system performance	The TPB monitors the performance of the region's transportation system and identifies and evaluates the benefits that various congestion management strategies may have.	The TPB travel monitoring activities associated with the CMP are communicated to inform decision-makers on the region's congestion through numerous documents, graphics and text compiled on the TPB website including an ongoing series of **National Capital Region Congestion Reports.**
2. Defining and analyzing strategies	With accurate and reliable data, the TPB and regional partners work to establish potential strategies and initiatives to help alleviate congestion, such as the seven Aspirational Initiatives that the TPB endorsed in 2018. Strategies include both demand management and operational management strategies as described in the additional CMP documentation.	The TPB's Congestion Management Report provides technical details and updated congestion information and congestion management strategies on the region's transportation systems, as well as the process integrating the CMP into the update to Visualize 2045.
3. Compiling project-specific congestion management information	The TPB collects from project sponsors a CMP Documentation Form for projects that require them. The requirement is that SOV capacity-increasing projects are only supposed to be implemented if non-SOV-capacity strategies were also considered. The forms document that such consideration has occurred.	CMP Forms are provided by implementing agencies as part of TPB's Technical Inputs Solicitation for LRTP and TIP projects that have significant CMP impacts.
4. Implementing strategies	The TPB manages the Commuter Connections program to promote and implement regional demand management. TPB members implement the strategies and submit projects, programs and policies to the TPB for inclusion in the LRTP and TIP.	As TPB members implement regionally significant projects, programs and policies that reflect the CMP strategies, they are included in the LRTP and TIP. Notable strategies include the region's **incenTrip app** and overall **Commuter Connections** programs.

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WHAT IS A PERFORMANCE MEASURE?

A numeric measure that can be used to quantify the performance of one or more characteristics of the transportation system.

Implementing PBPP

To implement PBPP in coordination with partners, the TPB is tasked with setting and monitoring progress toward targets for 26 performance measures. As PBPP progresses over the years, performance compared to the targets will help inform funding decisions and help achieve targets. More information about the TPB's PBPP efforts can be found in Appendix D: PBPP System Performance Report and at **mwcog.org/PBPP**.

The TPB, states, and providers of public transportation use the PBPP process in the following areas:

- Highway Safety
- Highway Assets
- Highway System Performance
- Vehicular Emissions
- Transit Asset Management
- Transit Safety

TPB's Role

For each of the six performance areas, the TPB is responsible for determining how to calculate measures and set targets for the metropolitan planning area. See Table 8.2 for all the areas and measures. The TPB's efforts complement those of state DOTs and public providers of transportation who are also responsible for calculating measures and setting targets at the state level or for the transit system. Accordingly, the TPB coordinates with the states and transit agencies in establishing measures and targets for the region.

States measure performance and set targets on a statewide basis, and providers of public transportation measure performance and set targets for their transit system. Depending upon the area of performance, targets are set annually, biennially, or every four years. States and providers of public transportation must also develop supporting strategic plans for monitoring and improving performance in order to achieve their selected targets. In addition to setting quantitative targets, periodic narrative reports on measured performance compared to previous targets are required. The TPB is required to complete a system performance report (Appendix D to this plan) with every quadrennial LRTP and also provides inputs to the reports that states must submit biennially. Target-setting is intended to be based on an agency's strategic plan and science-based methodology for forecasting performance based on measured trends and the funding available and programmed for projects that will affect performance.

The MPO (TPB) is responsible for collecting this information to calculate measures and set targets for the metropolitan planning area, as appropriate. MPOs have up to 180 days to adopt targets following the targets being set by state DOTs or providers of public

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transportation. MPOs must coordinate with the state DOTs and providers of public transportation in setting the metropolitan area targets, which should be based on the strategic plans and funded projects of the cognizant agencies.

Highway safety and transit safety targets are set annually. Other targets are set biennially or for a four-year period. The current four-year targets were set for the period 2018 through 2021. While this period has concluded, the actual performance data for these targets are not yet available at the time of this plan. The next round of four-year targets for period 2022-2025 must be set by state DOTs by October 1, 2022, with MPOs having up to 180 days afterwards to set targets.

COVID-19 IMPACTS ON TRANSPORTATION SYSTEM PERFORMANCE

Many of the performance measures that TPB reports reflect how the system handles the transportation demand. The COVID-19 pandemic has had a significant impact on when, how, and to what extent the transportation system is used as well as transit service provision levels. Performance trends reported for 2020 reflect these changes.

Table 8.2: The Six PBPP Areas — Measures and Current Targets

Performance Area	Measure	Metric	Adopted Targets *as of 1.9.2022*
Highway Safety	Five-Year Rolling Average	# of Fatalities	253.0
	Five-Year Rolling Average	Rate of Fatalities (per 100 million VMT)	0.588
	Five-Year Rolling Average	# of Serious Injuries (SI)	1,889.7
	Five-Year Rolling Average	Rate of Serious Injuries (per 100 million VMT)	3.867
	Five-Year Rolling Average	# of Nonmotorized Fatalities & SI	492.4
Highway Asset Condition	Percent Pavement Lane Miles Interstate/NHS (excl. Interstate)	In Good Condition	52.7% / 31.1%
	Percent Pavement Lane Miles Interstate/NHS (excl. Interstate)	In Poor Condition	1.7% / 7.0%
	Percent Bridge Deck Area	In Good Condition	0.294
	Percent Bridge Deck Area	In Poor Condition	0.039
Highway Reliability	Percent Person Miles Traveled Interstate/NHS (excl. Interstate)	Level of Travel Time Reliability	58.5% / 72.7%
Freight	Index	Truck Travel Time Reliability	2.12
Congestion	Annual Hours per Capita	Peak Hour Excessive Delay	26.7
	Percentage	Non-SOV Travel	0.372
Vehicular Emissions	Total Emissions Reduction (kg/day)	VOCs / NOx	2.195 / 4.703
Transit Asset Management	Percentage	Service Vehicles exceeding Useful Life	6.9% (Bus)
	Percentage	Revenue Vehicles exceeding Useful Life	46.7% (Truck)
	Percentage	Track Segments with Performance Restrictions	3.5% (Heavy Rail)
	Percentage	Facilities rated Marginal or Poor	4.1% (Pass. Facilities)
Transit Safety	Number & Rate (per Revenue Vehicle Mile)	Fatalities by Mode (showing Bus)	0 / 0
	Number & Rate (per Revenue Vehicle Mile)	Reportable Injuries by Mode (showing Bus)	411 / 0.69
	Number & Rate (per Revenue Vehicle Mile)	Reportable Safety Events by Mode (showing Bus)	463 / 0.78
	Mean Distance	Between Major Mechanical Failures by Mode (showing Bus)	13,654

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Performance Measures, Trends, and Targets

Highway Safety

Table 8.3 shows the five specific federally prescribed highway safety measures for which the TPB is required to establish targets, with annual trends over the past five years.

Target Setting Approach

The targets, which are 5-year averages, represent the performance outcomes anticipated for one year into the future. Once the targets are established they are reported to each of our state DOT partners.[38] The TPB also monitors the performance outcomes for each measure and reports the results to our state DOTs each year. This ongoing process of establishing safety targets and monitoring performance has been an important factor in the TPB's decision to adopt a regional roadway safety policy and also establish and fund the Regional Roadway Safety Program (see Chapter 6).

The TPB's planning area, for which performance targets are to be established, lies within three different jurisdictions: the District of Columbia, Maryland, and Virginia. As such, regional highway safety targets are determined by identifying sub-targets for the District

Table 8.3: National Capital Region Safety Trends (Sources: NHTSA, HPMS, and State DOTs)

	2015	2016	2017	2018	2019	2020	Change from 2019 – 2020
# of Fatalities	263	279	313	303	300	321	21 ↑
Fatality Rate (per 100 MVMT)	0.610	0.633	0.695	0.673	0.659	0.876	0.217 ↑
# of Serious Injuries	2,629	2,916	2,592	2,464	2,371	1,842	529 ↓
Serious Injury Rate (per 100 MVMT)	6.102	6.614	5.755	5.473	5.211	5.026	0.185 ↓
# Nonmotorist Fatalities and Serious Injuries	524	555	586	552	595	441	155 ↓

38 As required by federal rule, annual safety targets are expressed as five-year rolling averages. Additional detail: www.gpo.gov/fdsys/pkg/FR-2016-03-15/pdf/2016-05202.pdf.

of Columbia, Maryland, and Virginia portions of the region and applying each state's target setting approach to their respective portion of the region. Targets were developed by mathematically combining the three sub-targets into an overall target for the region.

Tracking Progress

Fatalities increased by 7 percent between 2019 and 2020 despite a significant decrease in VMT due to COVID-19 restrictions in 2020. The combination of these two factors resulted in a 33 percent increase in the fatality rate (per VMT). The increase in the number and rate of fatalities in the region reflected national trends and was driven in large part by increases in speeding, which was enabled by the reduction of congestion due to COVID-19 mitigation efforts, as well as increases in aggressive driving, and impaired driving. Both the number and rate of serious injuries fell significantly and the number of nonmotorist fatalities plus serious injuries decreased by 26 percent between 2019 and 2020.

Table 8.4 shows the region's performance on the five safety performance measures with respect to the 2016-2020 targets set in December of 2019. As shown, the region has met the 2016-2020 targets for the number of serious injuries and the serious injury rate performance measures. However, the region did not meet the targets set for the number of fatalities, the number of nonmotorist fatalities and serious injuries, and the fatality rate targets. The TPB Safety Study examined the numerous influences and behaviors that impact safety for users of the transportation system. **Learn more about the study in Chapter 6 or read the report online**.

Arlington DES/Flickr

Table 8.4: 2016 – 2020 Actuals vs. Targets (Sources: NHTSA, HPMS, and State DOTs)

	2016 – 2020 Actual	2016 – 2020 Target	Status
# of Fatalities	303.2	253.0	Not Met
Fatality Rate (per 100 MVMT)	0.701	0.588	Not met
# of Serious Injuries	2,437.0	2,692.1	Met
Serious Injury Rate (per 100 MVMT)	5.616	6.157	Met
# Nonmotorist Fatalities and Serious Injuries	557.3	508.6	Not met

Highway Asset Management

There are six federally prescribed highway asset management measures for which the TPB is required to establish targets. The current targets were established for the four-year period of 2018-2021 and are updated biennially to track the condition of highway pavement and bridges in the region.

Target Setting Approach

Regional highway asset targets were determined by identifying sub-targets for the District of Columbia, Maryland, and Virginia portions of the region and applying each state's target setting approach to their respective portion of the region. These sub-targets are informed by state-specific pavement and bridge condition results reported to federal databases. Targets for the region were developed by combining the sub-targets for each state-portion of the region to create the region-wide net result.

Tracking Progress

Hundreds of millions of dollars are spent every year in the region on keeping the highway system's pavement and bridges in a state of good repair. Projects ranging from periodic repaving to complete replacement of bridges after a 50-plus year lifetime determine asset performance. Funds for ongoing maintenance are often constrained, limiting what can be kept in good condition rather than fair condition. Major projects can address bridge condition, especially the replacement of poor condition bridges. While states measure and report asset condition for the pavement and bridges of the NHS in their state, some sections of the NHS are outside of their control; for example, the NPS owns several parkways and important bridges in the region. Asset performance is forecast based on both funding for regular maintenance and the completion of major projects. Shortfalls or delays in funding, therefore, have an impact on the actual performance data that states report. Highway owners in the region aim to keep infrastructure as good or fair as it is now, with periodic efforts to improve poor bridges, most recently on the Capital Beltway in Maryland and for the replacement of major bridges in DC, including the 11th Street Bridge, Frederick Douglass Bridge, and Arlington Memorial Bridge, owned by the NPS.

Figure 8.2: Pavement and Bridge Condition for the TPB Planning Area [1670.8 Interstate Lane Miles] (Source: Transportation Planning Board, 2017; includes IRI data only, data excludes sections with bridges, ramps, non-mainline, non-inventory direction, planned/unbuilt, unpaved and other types.)

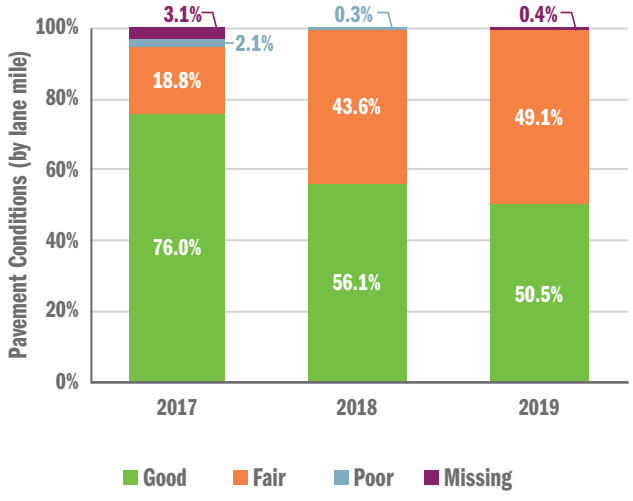


Figure 8.3: Non-Interstate NHS Pavement Conditions, 2017 – 2019 [4654.3 Non-Interstate NHS Lane Miles] (Source: Transportation Planning Board, 2017; includes IRI data only, data excludes sections with bridges, ramps, non-mainline, non-inventory direction, planned/unbuilt, unpaved and other types.)

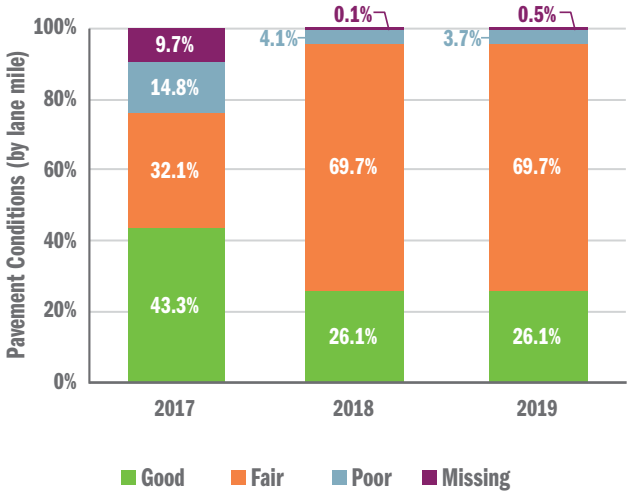


Figure 8.4: NHS Bridge Conditions, 2018 – 2020 (Source: Transportation Planning Board, includes 1,216 bridges and 223 culverts; 26 structurally deficient.)

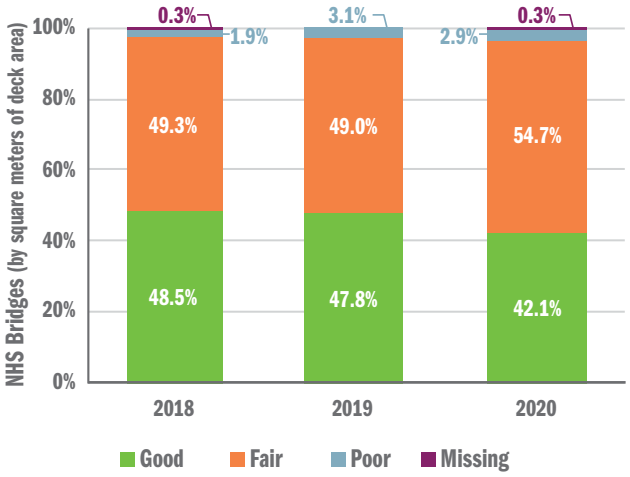
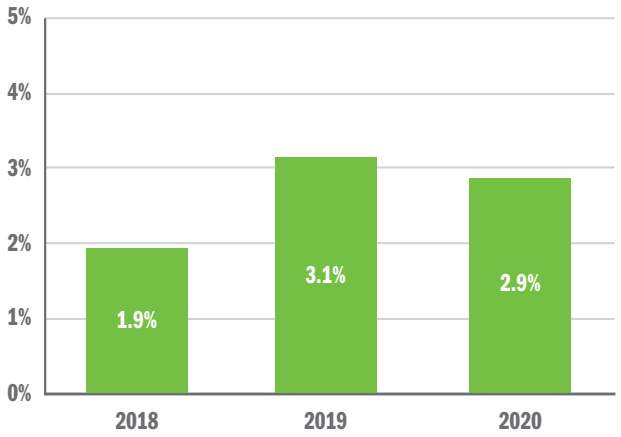
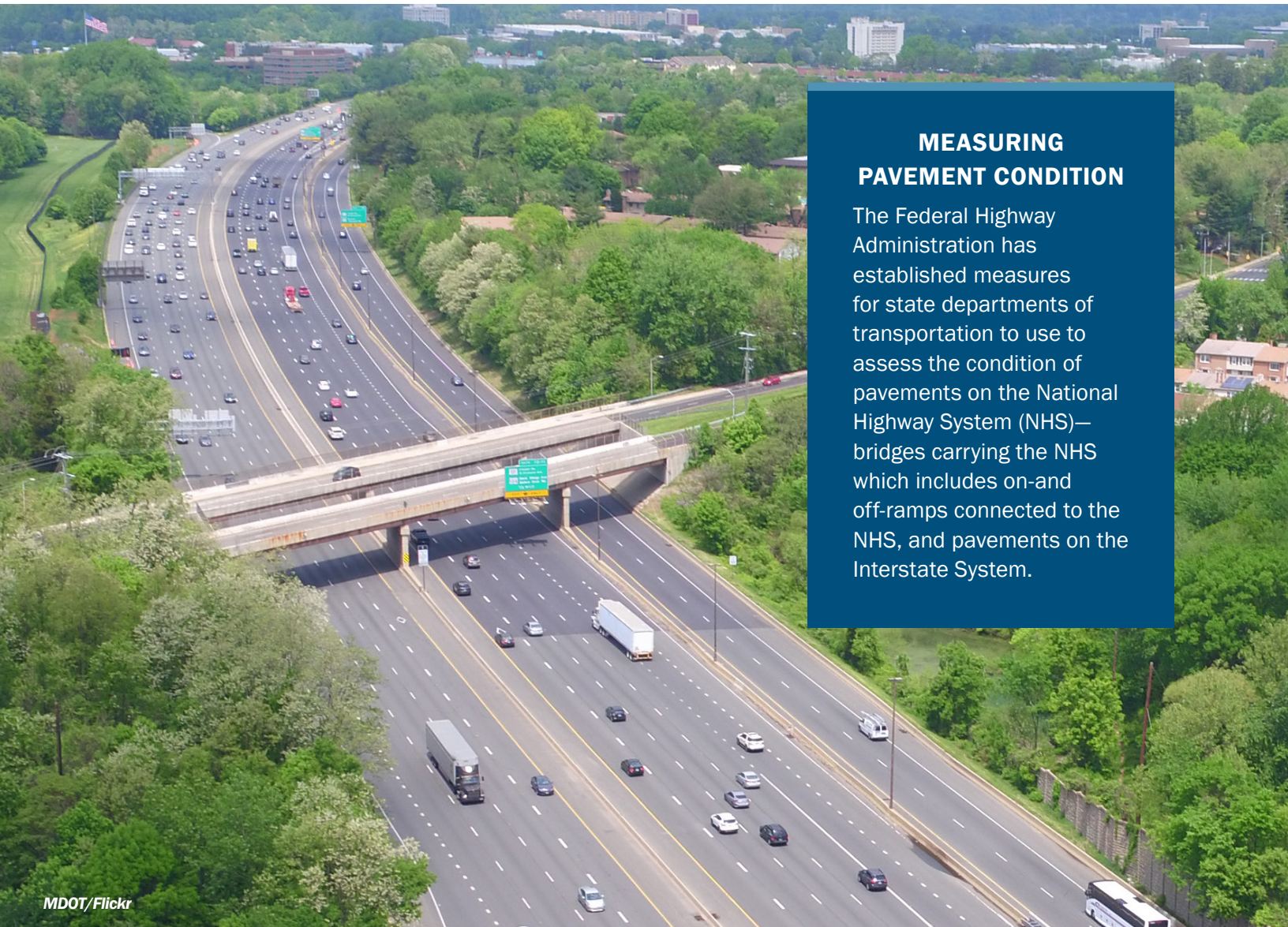


Figure 8.5: Structurally Deficient NHS Bridges, 2018 – 2020 (Source: Transportation Planning Board; includes 1,216 bridges and 223 culverts; 26 structurally deficient.)





MDOT/Flickr

MEASURING PAVEMENT CONDITION

The Federal Highway Administration has established measures for state departments of transportation to use to assess the condition of pavements on the National Highway System (NHS)—bridges carrying the NHS which includes on-and off-ramps connected to the NHS, and pavements on the Interstate System.

VDOT/ Flickr

Highway System Performance

There are five federally prescribed highway system performance measures considered through the lenses of congestion and freight, for which the TPB is required to establish targets. These include: Interstate Travel Time Reliability (TTR), Non-Interstate National Highway System TTR, Truck TTR Index, Annual Hours of Peak Hour Excessive Delay (PHED) Per Capita, and Percent of Non-SOV Travel on the NHS. The current targets were established for a two- and four-year period (2018-2019 and 2018-2021) and are updated biennially to track the condition of highway pavement and bridges in the region.[39] Forecasts and targets are established like those for asset management. Due to the complexity of the methodologies for calculating these measures, please refer to the Visualize 2045 Appendix D, Systems Performance Report, for more detail on these measures.

Tracking Progress

Figure 8.6 shows the trends in travel time reliability on the interstate. In 2018 and 2019 actual data was slightly higher than predicted, with travel times more reliable. The impact of the COVID-19 pandemic is obvious in 2020, with travel times much improved in reliability. The same general findings apply to the non-interstate travel time reliability and truck travel time index and to the hours of peak hour excessive delay measure. Travel time reliability is mostly affected by demand on the highway system and the decisions millions of drivers make every day than by changes to the highway system itself. Roadwork and construction delays from major projects can also impact travel time reliability on major corridors, and there have also been changes in data collection that can impact results. However, targeted spot improvements and the slow expansion of the highway system over time have recently been able to match travel demand with the result that reliability has been fairly constant. In the long term, however, it is expected that population and economic growth will lead to significantly worse congestion and reduced travel time reliability unless different decisions are made by commuters, residents, and commercial transportation services.

39 Under this rule, DOTs must establish two-year and four-year targets related to highway system performance on a biennial cycle. Additional detail: gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00681.pdf.

Figure 8.6: Interstate Travel Time Reliability [Target], 2015 – 2021 (Source: Transportation Planning Board)

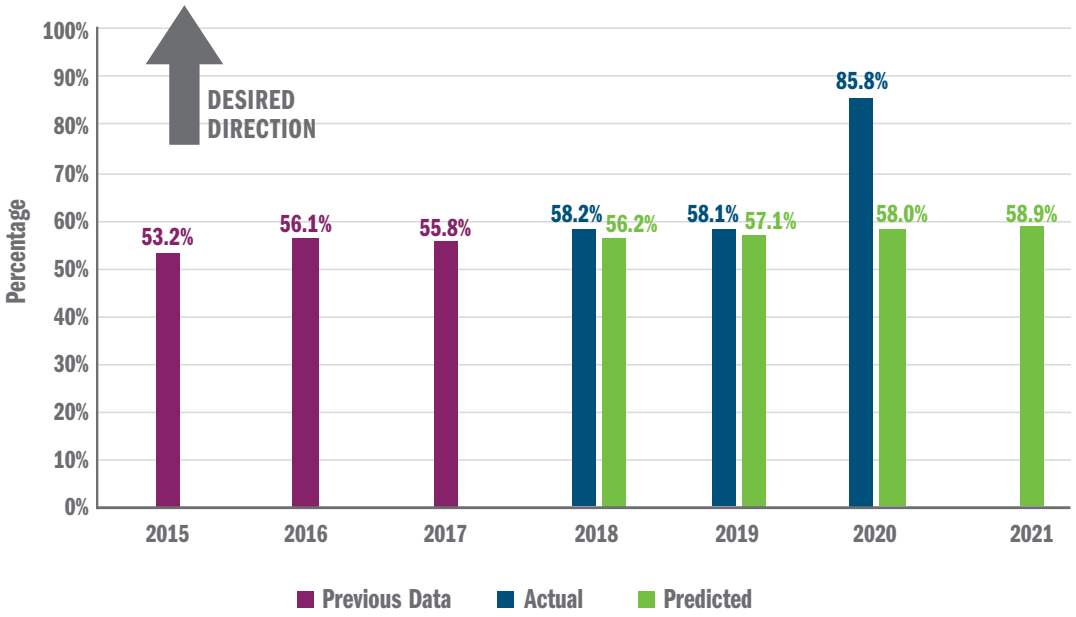
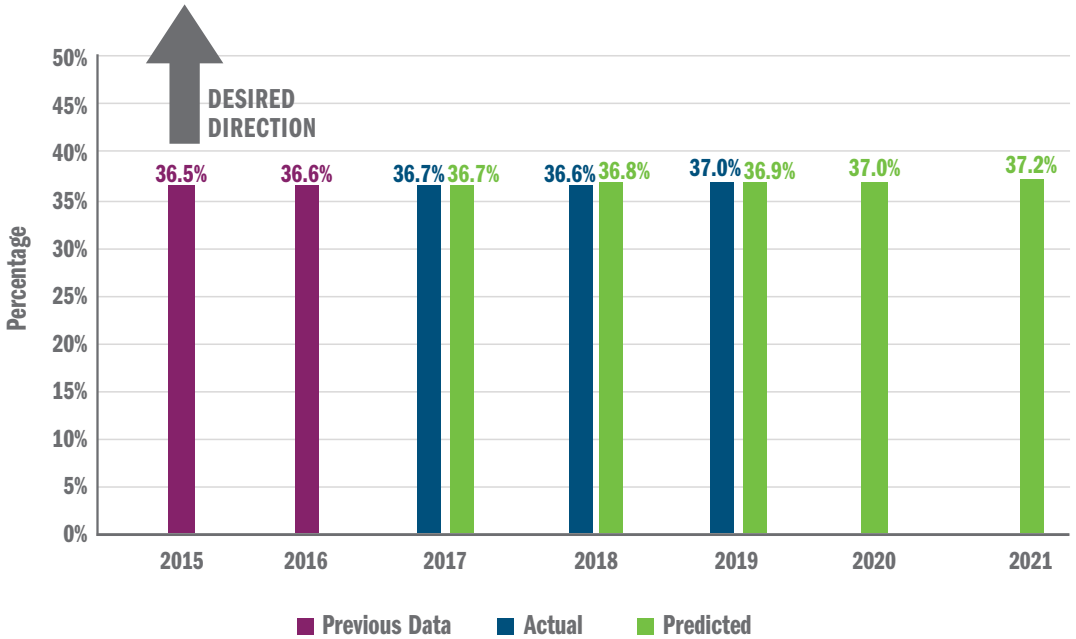


Figure 8.7: Traffic Congestion — Mode Share [non-SOV, Target] (Source: Transportation Planning Board)




MDOT/Flickr

Vehicular Emissions

There are two pollutants under the federally prescribed vehicular emissions measure for which the states and the TPB are required to establish targets. The targets are established for a two- and four-year period (2018-2019 and 2018-2021) and are updated biennially to track the vehicular emission reduction in the region. The states and the TPB must coordinate on and collectively establish a single, unified two- and four-year target for the estimated reductions in emissions of each applicable pollutant due to CMAQ funded projects.

The metropolitan Washington region is monitored for air quality affected by Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NOx) pollutants. Accordingly, the TPB works with the three states to collect data on past emissions reductions calculations and on those anticipated in the next four years to set targets. Unlike other performance measures, the Emissions Reductions measures are based on model calculations and not on data of actual performance or observed conditions. See Figures 8.8 and 8.9 for forecast emissions data.

*Elvert Barnes/Flickr**

Figure 8.8: Reductions in Volatile Organic Compounds [VOCs], 2015 to 2018 – 2021 Predicted (Source: TPB)

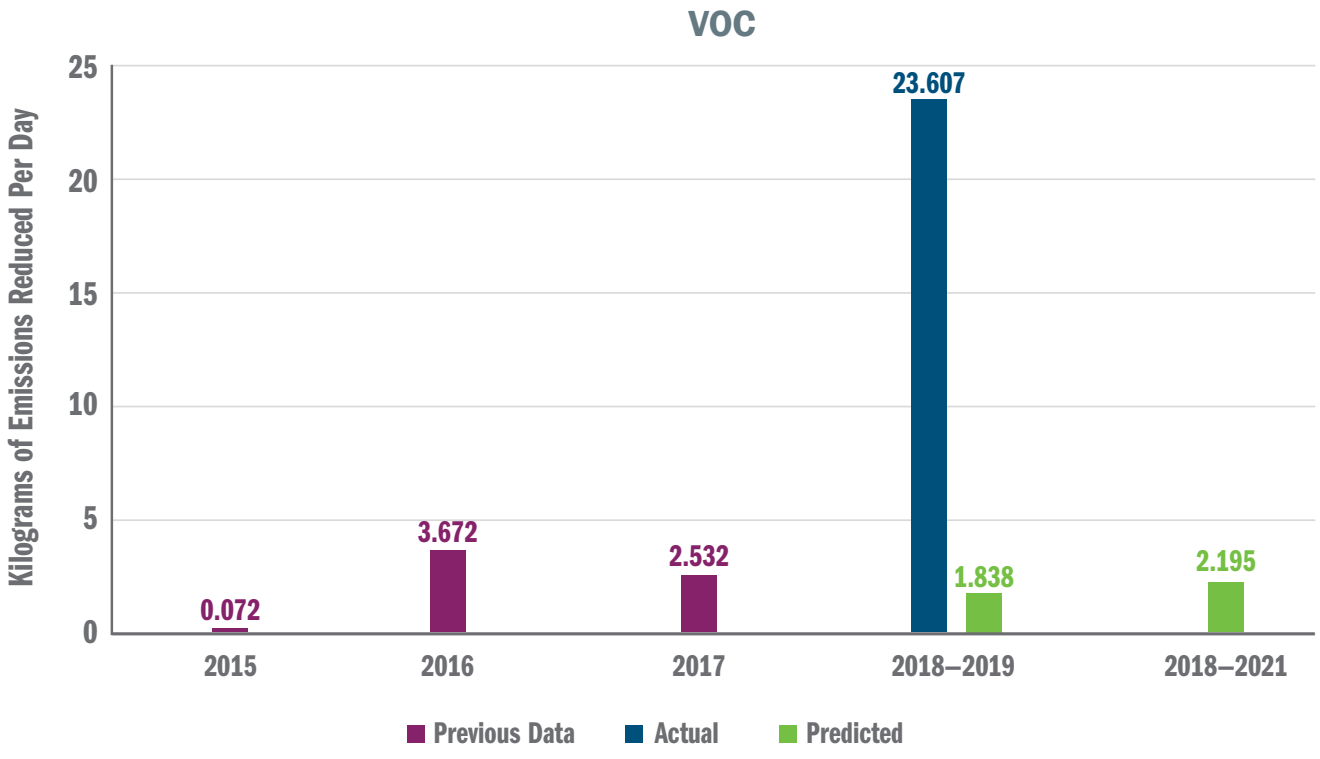
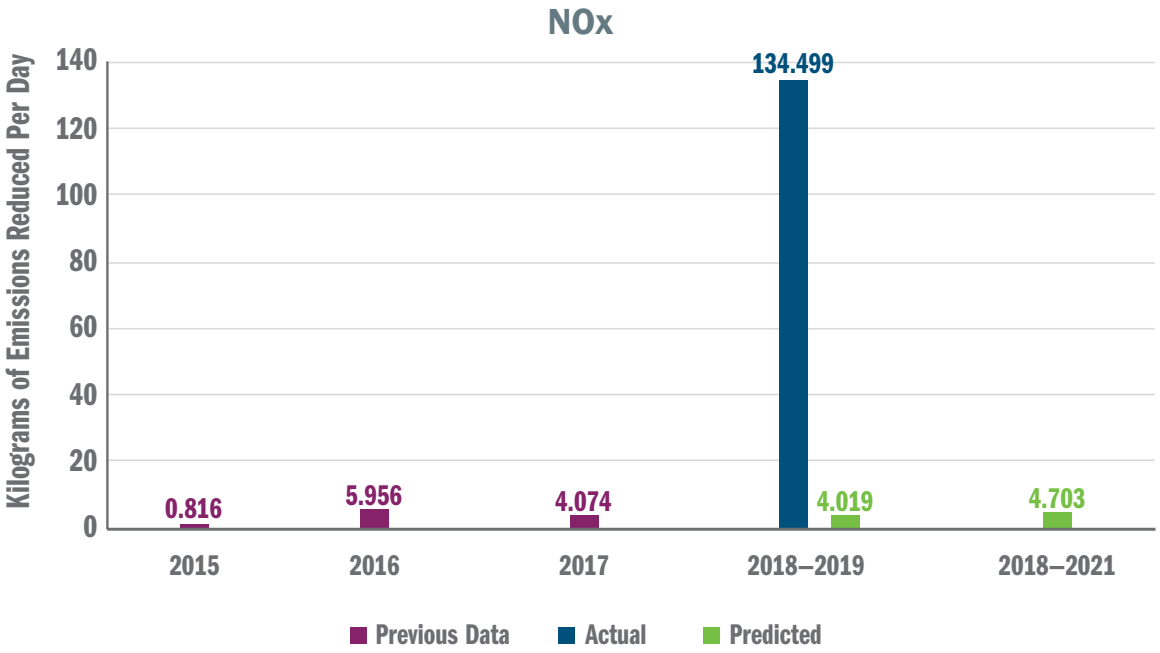


Figure 8.9: Reductions in Nitrogen Oxides [NOx], 2015 to 2018 – 2021 Predicted (Source: TPB)



Tracking Progress

The targets set for the reduction of vehicular emissions for the two pollutants were met and exceeded for the two-year and four-year targets (2018-2019 and 2018-2021 respectively). The implementation of transit improvement projects and ride sharing initiatives with CMAQ program funding, among other projects, led to significant reductions in calculated emissions.

VDOT/Flickr

Elvert Barnes/Flickr

Transit Asset Management

There are four specific federally prescribed transit asset management measures for which providers of public transportation and the TPB must collect and report on for the TPB planning area. These measure the performance of transit asset management to ensure effective operation, maintenance, and improvements of capital assets through their useful life.[40] The targets are established annually by providers of public transportation who must also develop a four-year plan for managing these capital assets.

The TPB's planning area for which transit asset management performance targets are to be established includes seven Tier 1 agencies (public transportation operators of rail or more than 100 vehicles) and twelve Tier 2 agencies (operate less than 100 vehicles). Tier 1 agencies report their information to the Federal Transit Administration (FTA) directly and to the TPB. Tier 2 agencies submit information to their respective state transit agencies, the MDOT-MTA or the Virginia DRPT, which then group the information for reporting to the FTA and to the TPB.

The four transit asset performance measures are split between two age-based (Rolling Stock and Equipment) and two condition-based measures (Condition of Infrastructure and Condition of Station/Facilities). For each type of asset, a threshold is established for permissible age or condition (e.g., a bus should be no more than 15 years old, or a facility should not have any failing components). Targets are set by the providers of public transportation on the maximum percentage of assets that are allowed to exceed the threshold (e.g., no more than 8 percent of buses can exceed 15 years old).

The regional TAM targets are developed in accordance with the FTA guidance, which suggests that the MPOs adopt a single target for each asset class in the region. As shown in Table 8.5, the regional targets calculate the total number of each asset class and the associated target based on the targets of each provider of public transportation. The table also shows the regional targets established for revenue vehicles.

Table 8.5: Regional Transit Asset Management Targets for Revenue Vehicles, 2022 (Source: Transportation Planning Board)

Percentage of Revenue Vehicles that Have Met or Exceeded Useful Life Benchmark	Regional Assets Total	Regional Target
Articulated Bus	95	2.5%
Auto	253	0.0%
Over-the-Road Bus	214	12.4%
Bus	2,616	6.9%
Cutaway Bus	112	0.7%
Heavy Rail Passenger Car	866	0.0%
Light Rail Vehicle	6	0.0%
Commuter Rail Locomotive	20	0.0%
Commuter Rail Passenger Coach	100	0.0%
Van	693	0.0%
Revenue Vehicle Totals	***4,975***	

40 Additional detail: gpo.gov/fdsys/pkg/FR-2016-07-26/pdf/2016-16883.pdf

Transit Safety

The federal transit safety rules require providers of public transportation and the TPB to collect and report data for four performance measures that track the condition of transit safety in the TPB planning area.[41] These measures include the number and rate of fatalities, injuries, safety events (derailments, collisions, fires, and evacuations), and also system reliability (mean distance between major and other mechanical system failures).

David Wilson/Flickr

Target Setting Approach

Targets for the region are based on those adopted by each applicable provider of public transportation, with the total number of events added up, and when a rate measure is called for it is calculated by dividing the total number of events by the total number of the vehicle revenue miles traveled by each mode.

Tracking Progress

Initial reporting on transit safety performance and establishment of targets began in 2020. The requirement only applies to providers of public transportation that are federal Section 5307 funding recipients and sub-recipients under FTA regulation, primarily WMATA and transit systems in DC and suburban Maryland. The rule is not applicable for local transit systems in Northern Virginia.

Table 8.6: Transit Safety Targets, 2021; rates are per 100,000 Vehicle Revenue Miles (Source: Transportation Planning Board)

	Fatalities		Serious Injuries		Safety Events		Reliability
	Number	Rate	Number	Rate	Number	Rate	Mean Distance Between Failures
Heavy Rail	0	0	244	0.31	84	0.11	254,000
Streetcar Rail	0	0	0	0.00	4	0.27	672
Urban Bus	0	0	411	0.69	463	0.78	13,654
Commuter Bus	0	0	6	0.07	20	0.23	13,265
Demand Response	0	0	40	0.19	18	0.08	0
Vanpools	0	0	6	0.05	118	1.05	9,500

41 Additional detail: gpo.gov/fdsys/pkg/FR-2017-01-18/pdf/2017-00678.pdf and gpo.gov/fdsys/pkg/FR-2018-07-19/pdf/2018-15167.pdf

PBPP, CMP, and the Projects in the Constrained Element

As overarching strategies PBPP and the CMP are implemented not only through numerous travel demand activities and transportation options provided by transportation agencies but also by actions of planning agencies that work with their citizens to plan for how communities grow and change. Land use patterns impact when, where, and how people and goods travel. Learn more about many of these activities in Chapter 6 of this plan. The ongoing analysis and performance evaluation through the PBPP and CMP, as well as the TPB's regional evaluation of current and future performance of the transportation system inform the strategies implemented in the region that become the projects that are planned and programmed in the LRTP.

The projects incorporated into the financially constrained element of the update to Visualize 2045 and the projects and programs that are programmed for funding in the FY 2023-2026 TIP reflect the ongoing commitment of the TPB to achieving its goals, preserving the region's massive transportation system, providing demand management strategies for a livable region and to manage congestion, continuously working toward a safer transportation system, and more. These goals align with the National Goals (as shown in Chapter 3). The TPB and its members document the linkage from planning, to investment, and implementation through the PBPP process. Please see the FY 2023-2026 TIP for more detail on how the projects to be implemented in the next four years will support progress toward regional PBPP performance measure targets.

Der Berzerker/Flickr

As described by FHWA, "transportation performance management is a strategic approach that uses system information to make investment and policy decisions to achieve national performance goals. The application of the performance management approach ensures that investments are performance-driven, and outcome based." Accordingly, states, MPOs, and providers of public transportation are required "to apply performance management principles in making decisions about where to invest resources. Those processes and investment strategies are documented in management plans the agencies develop for the various program areas. All management plans are then used in the performance-based planning and programming process to make investment trade-off decisions."

As the TPB does not implement projects, its coordination with the three state DOTs and other transportation agencies in the region is essential to demonstrate how the PBPP is implemented at the regional level. Figure 8.10 illustrates the cycle of how DOTs plan for, invest in, and evaluate the performance of the region's transportation system. These are key activities to implement PBPP. Measured performance compared to targets aids agencies in determining how to develop, prioritize, and inform transportation plans and projects.

Figure 8.10: Plan, Invest, Evaluate [PBPP activities]

TPB & DOTs

- Set vision, goals, objectives, targets
- Conduct analysis/develop strategies & plans
- TPB's Visualize 2045
- State & Local Plans
- Strategic Highway Safety Plans (SHSP)
- Asset Management Plans
- Corridor Plans
- Get stakeholder input on performance, plans, & strategies

DOTs

- Develop projects based on studies, performance metrics, and plans
- Prioritize projects consistent with goals and PBPP targets
- Address federal planning requirements for air quality & PBPP targets
- Gather public input

PLAN

INVEST

EVALUATE

Engage the Public

TPB & DOTs

- Congestion Management Process
- TPB Air Quality Conformity analysis, environmental justice analysis, and regional system performance analysis of constrained element
- Federal PBPP and other performance measures tracked at state, regional (TPB) & local level (agencies update performance targets based on performance)
- Develop, refine or prioritize strategies to address performance gaps


BeyondDC/Flickr

Air Quality Conformity Analysis Summary

The Air Quality Conformity analysis demonstrates how the region is working towards its environmental goals. One of these goals comes from the Regional Transportation Priorities Plan (RTPP), which states the TPB's work should "enhance environmental quality and protect natural and cultural resources." The financially constrained element of the Visualize 2045 update must demonstrate that future emissions under the plan are consistent— "in conformity" —with emissions levels set forth in air quality plans adopted by the states. Federal law requires "conformity findings" in all metropolitan regions that are currently not in attainment of certain federal air quality standards ("non-attainment areas"). Since the Washington region is a non-attainment area for ground-level ozone, the TPB must demonstrate that future vehicle-related emissions of ozone-forming pollutants will, under the proposed constrained element plan, remain below the approved limits. This section summarizes the Air Quality Conformity analysis, and the full document can be found in Appendix C: Air Quality Conformity Analysis Summary.

Pollutants Analyzed

Ozone pollution is harmful to people and the environment. Therefore, the region must show through a detailed technical analysis that future vehicle-related emissions of the two key ingredients in the formation of ozone—nitrogen oxides (NOx) and volatile organic compounds (VOCs)—are expected to remain below approved regional limits. The Metropolitan Washington Air Quality Committee (MWAQC) facilitates the establishment of the regional limits for on-road mobile

FEDERAL REQUIREMENTS

The Clean Air Act requires that transportation and air quality planning be integrated in regions like this one that are designated by the U.S. Environmental Protection Agency (EPA) as air quality "non-attainment" areas. In such areas, as well as in areas designated as "maintenance," federal funding and approval for transportation projects is only available if transportation activities are consistent with the region's air quality goals. Before the 2022 update to Visualize 2045 can be adopted, the TPB must approve a "conformity determination" showing that anticipated future vehicle-related emissions will remain below regional limits (known formally as "motor vehicle emissions budgets") that have been set by the region's air quality improvement plan (known as the "State Implementation Plan" or "SIP") and approved by the EPA. The Metropolitan Washington Air Quality Committee (MWAQC) is the body responsible for developing the regional air quality plan. The conformity determination will demonstrate that the constrained element of the Visualize 2045 update is consistent— "in conformity" — with the regional limits.

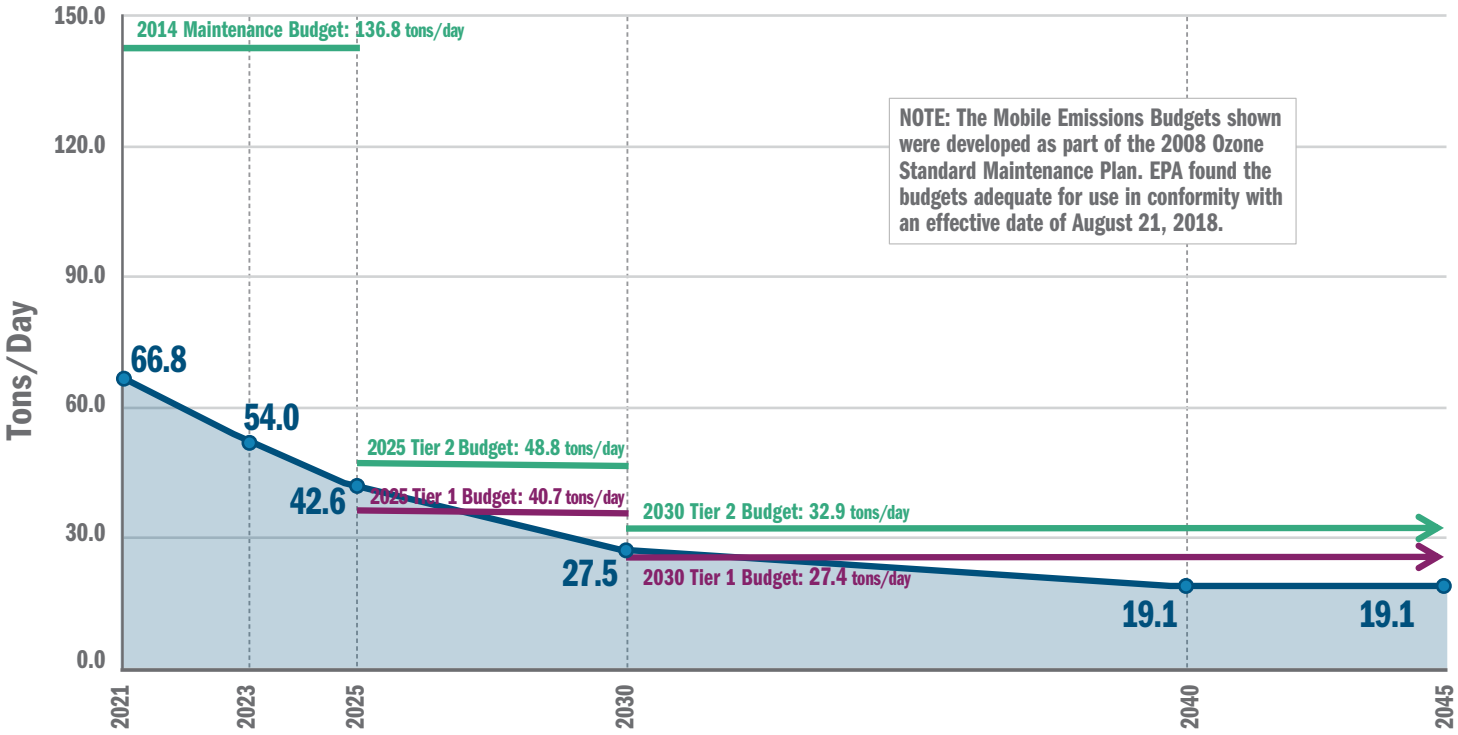
emissions of VOCs and NOx, which combine in sunlight on hot summer days to form ground-level ozone. Motor vehicles are one of several sources responsible for VOC and NOx emissions in the region. A few examples of others include power plants, residential heating and air conditioning, dry cleaners, gas stations, boats, airplanes, construction vehicles, and lawn care equipment.

Air Quality Conformity Analysis Results

Under the constrained element of the Visualize 2045 update, mobile emissions are expected to drop steadily (Figures 8.11 and 8.12) mainly due to more stringent fuel and vehicle efficiency standards.[42] In spite of increased travel, mobile emissions are expected to steadily decrease through the 2045 horizon year of the plan, mainly as cars and trucks meeting increasingly more stringent federal fuel and vehicle efficiency standards enter the region's vehicle fleet (all cars in the region) and as changes are made to the formulation of vehicle fuel. Changes in development patterns, investments in transit and other travel options, and improved operational efficiency of area roadways will also contribute to reductions in vehicle-related emissions. Project sponsors identified 171 projects in the constrained element of this plan that are expected to contribute to reductions in emissions of criteria pollutants.

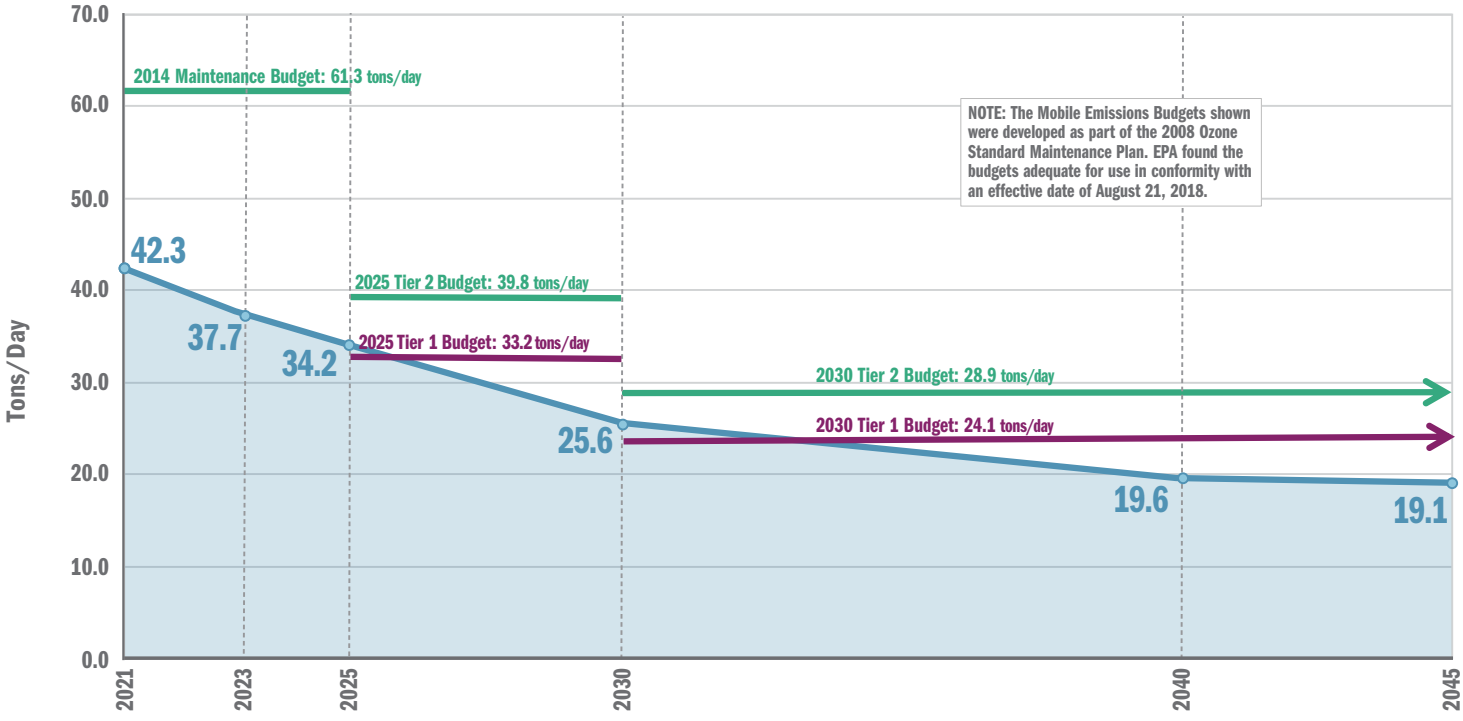
The plan's Air Quality Conformity analysis included comparing forecasted mobile source emissions to the region's two tiers of mobile emissions budgets for VOC and NOx. The conformity analysis found that forecasts of mobile emissions for VOC and NOx are within required budgets for all analysis years of the plan. Details related to the two tiers of mobile budgets can be found in Appendix C: Air Quality Conformity Analysis Summary.

Figure 8.11: 2022 Update to Visualize 2045 Air Quality Conformity Mobile Source Emissions and Mobile Emissions Budgets Ozone Season NOx



42 NOTE: The mobile budgets shown were developed as part of the 2008 Ozone Standard Maintenance Plan. EPA found the budgets adequate for use in conformity. The adequacy finding was published in the Federal Register on August 6, 2018, with an effective date of August 21, 2018.

Figure 8.12: 2022 Update to Visualize 2045 Air Quality Conformity Mobile Source Emissions and Mobile Emissions Budgets Ozone Season VOC



Performance Analysis Summary

Why the TPB Forecasts Performance

The TPB measures and forecasts future performance as one way of tracking progress on the goals and priorities presented in the TPB Policy Framework (see Chapter 3). The performance analysis considers how well the anticipated transportation system will accommodate current and forecast travel demand and address mobility, accessibility, and environmental challenges such as greenhouse gas (GHG) emissions. It also examines how future expected changes to the transportation system advance key regional goals and strategies in the TPB's policy documents. The results of the analysis can help decision-makers and the public better understand what changes to current plans and funding might be needed to achieve different future outcomes.

Regional Performance Analysis Approach for Visualize 2045

This performance analysis of Visualize 2045 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 laid out in the constrained element of Visualize 2045.[43]

The analysis examines more than twenty performance measures to understand how typical travel and commuting characteristics will change over time. It examines how the existing highway and transit networks serve the region and the impact of planned projects. This analysis is one of many that the TPB conducts to understand the region, as presented throughout this plan and other products. The TPB uses performance measures from other planning activities to check progress on the goals and priorities presented in the TPB Policy Framework. **Learn more about TPB performance measures at Visualize2045.org or view a summary online.**

Planning Uncertainties

Long-range planning at the TPB seeks to help area decision-makers and residents "visualize" the region's future. The TPB recognizes that many external future factors may impact mobility and accessibility (see Chapter 4). How will travel in this region more normally operate in a post-COVID-19 environment? In particular, what will be the impacts of telework? How will climate change and resiliency, changes to the global economy, and the impact of new technology—particularly vehicle automation and electrification—affect the location of people and jobs, how people travel, and funding to invest in and maintain the system? While many of these questions are beyond the scope of this analysis, the TPB does conduct planning and analyses to examine these, and other possible futures that might occur. See Chapter 6 to learn more about TPB planning activities.

Various assumptions, largely driven by federal requirements for the Air Quality Conformity analysis, are included in the TPB's travel demand model to provide a long-range forecast of where, when, and how people will travel around the region. Notably, much of the underlying data is reflective of and validated to pre-COVID-19 travel conditions. While the pandemic has changed many recent travel characteristics in the region, less is known about its impact 10 to 25 years from now and, as a result, has not been incorporated into this analysis.[44] Existing transit service, and its associated frequencies, headways, and hours of operation, reflect December 2019 schedules. Transit fares and highway tolls are current to January 2021. And vehicle fleet data, or the type of vehicles people and business use to travel and conduct business, is current to December 2020.

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43 Unless otherwise noted, the results of this analysis use the following input data: MWCOG's Round 9.2 Cooperative Forecasts of land activity, TPB's Gen2/Version 2.4 Travel Demand Model, 2020 Vehicle Registration Data, and EPA's MOVES 2014b Mobile Emissions Model. Results of this analysis use a 2023 base year "Today" scenario and are for the TPB Planning Area. These findings are based on regional model estimates that come with a degree of uncertainty.

44 Further, transit service, like frequencies, headways, and hours of operation, reflect December 2019 schedules. Transit fares and highway tolls are current to January 2021. And vehicle fleet data, or the type of vehicles people and business use to travel and conduct business, is current to December 2020.

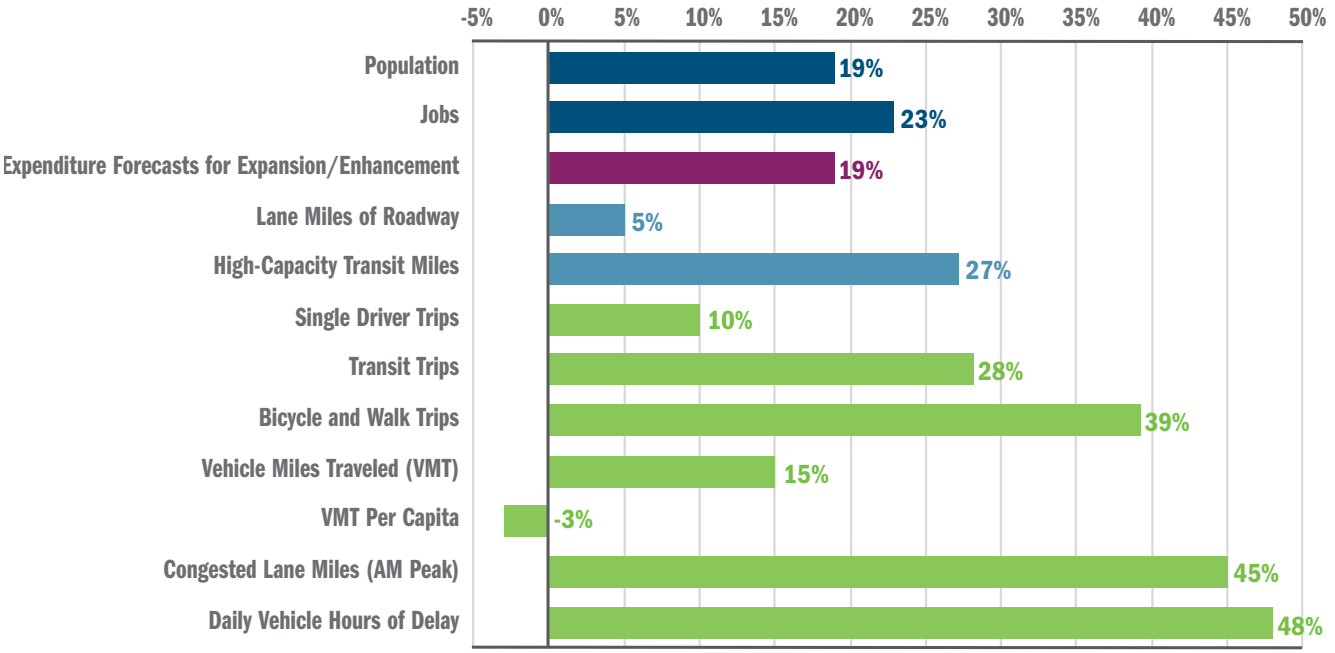
Performance Analysis Results

The performance analysis of Visualize 2045 forecasts that the region will make progress on many of its goals, due in part to the inclusion of projects that align with the Aspirational Initiatives TPB calls on its members to advance. See Chapter 7 for examples of projects in the constrained element that advance the initiatives. The land-use inputs in this analysis, COG's Round 9.2 Cooperative Forecast data, suggest that the region is looking to bring jobs and housing closer together through targeted density increases in certain parts of the region (see population weighted density analysis in Chapter 2).

People will have more and improved travel options in 2045 and that is reflected in the performance forecasts. The region will increase availability and use of High-Capacity Transit (HCT) and other "reliability-enhanced" modes (such as rail, bus rapid transit, walk and bike, and High Occupancy Toll and High Occupancy Vehicle lanes), decrease driving per person, and improve average access to jobs. Growth will likely continue to place heavy demands on the transportation network. The region expects 19 percent growth in population and 23 percent increase in jobs by 2045 compared to 2023.[45] While this growth is expected throughout the region, it will likely be focused in Activity Centers and HCT station areas, where 67 percent of jobs and 24 percent of residents are predicted to be located.

However, the region's financial obligations to maintain and operate the existing system limit the availability of funds for system expansions and enhancements, providing for an additional five percent in roadway miles and 27 percent increase in HCT miles compared to 2023.[46] Roadway and transit demand increases will likely place more stress on an already stressed transportation network, increasing delay and congestion and reducing auto-based job access for parts of the region (Figure 8.13).

Figure 8.13: Performance Overview (*Travel Demand Model outputs present data for years 2023 and 2045, therefore percentage increases vary from other reporting in this plan that is based on COG Round 9.2 Cooperative Forecast with 2020 as the base year.*)



45 Population and Job figures presented in this section use a 2023 base year and are different from figures presented in other sections of this plan, notably Chapter 2. These figures are calculated from the Gen2/Ver. 2.4 Travel Demand Model as informed by COG's Round 9.2 Cooperative Land-Use Forecasts.

46 High-Capacity Transit miles includes additional transit service mileage from Metrorail, light rail and streetcar, bus rapid transit, and commuter rail. While not included in this figure, commuter rail infrastructure improvements within existing transit service, like planned third and fourth tracks, are documented within this plan's project listings and TIP.

How is Travel Expected to Change in the Region Over Time?

Residents of the region are likely to be driving fewer miles per person in 2045 than they do today. Even though regional population is expected to increase by nearly 19 percent, on average, driving per person in the region, including residents, freight, and all other travel, is forecast to increase by 15 percent, resulting in a nearly three percent decline in vehicle miles traveled per capita (Figure 8.14). When examining vehicle miles traveled by isolating the analysis to only residents of the region, vehicle miles traveled per capita declines by an even greater amount (Figure 8.15). These findings suggest 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.

Figure 8.14: Total Roadway VMT (*Travel Demand Model outputs present data for years 2023 and 2045, therefore percentage increases vary from other.*)

Figure 8.15: Resident VMT (*Travel Demand Model outputs present data for years 2023 and 2045, therefore percentage increases vary from other.*)

Consistent with the TPB's goals, more people will choose to walk, bike, take transit and ride together rather than drive alone (Figures 8.16 and 8.17). However, a large portion of the region continues to be auto dependent. By 2045, 78 percent of travel for all trips in the region will be auto-based, either single-occupant or high-occupancy vehicle and carpool. Over time, the rate of growth of single occupant vehicle is less than high-occupancy vehicle and carpool, estimating that by 2045 more trips will be taken with multiple individuals in a car than single occupancy (Figure 8.17).

Figure 8.16: All Trips by Mode, Today – 2045

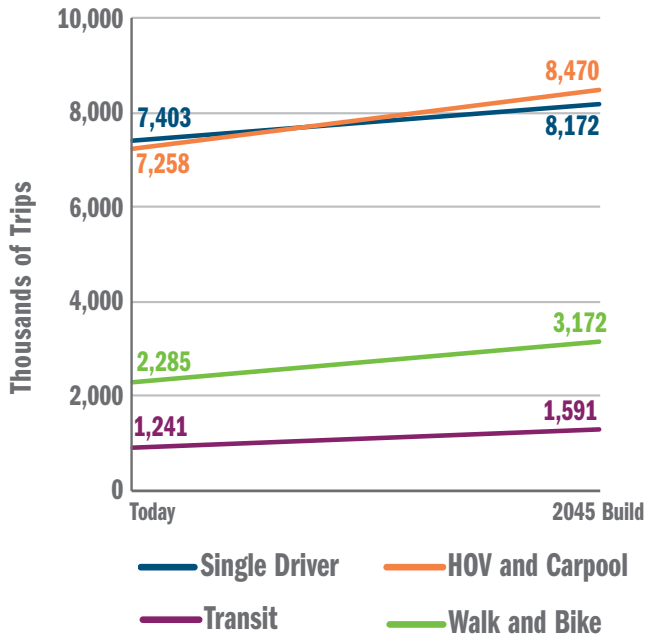
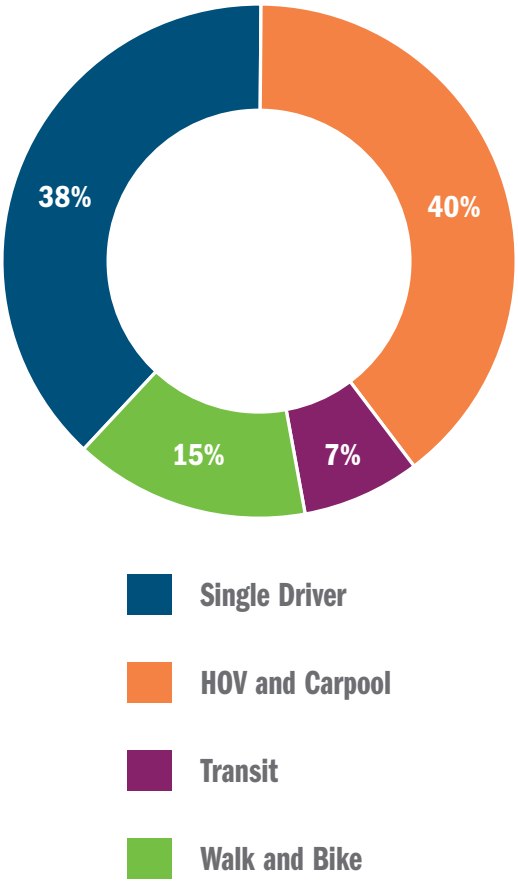


Figure 8.17: Mode Share, All Trips, 2045



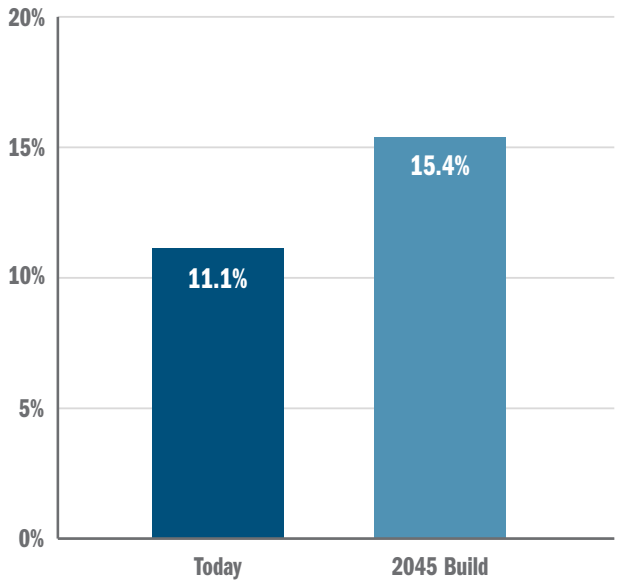

John Sonderman/Flickr

Steve Petrucelli/Flickr

While most projects in the plan are intended to improve reliability in the region through some type of infrastructure expansion or enhancement, a subset of projects described here as "Reliability-Enhanced" modes tend to provide additional enhancements to offer reliability and congestion mitigation. "Reliability-Enhanced" modes include express toll lanes/high-occupancy toll (HOT) lanes with dynamic toll rates, high occupancy vehicle (HOV) lanes, the Inter-County Connector in Maryland, Dulles Airport Access Road in Virginia, Metrorail, commuter rail, light rail, streetcar, bus rapid transit, long-haul express buses, and walk and bike travel.

The region continues to add transportation projects aimed at enhancing reliability and mitigating congestion. Forecasts estimate that a greater percent of regional travel will be on these modes, from 11 percent today to 15 percent in 2045 (Figure 8.18). The addition of these types of projects suggests greater mode choices can lead to less dependency on single-occupant vehicle travel and individuals seeking greater reliability in their travel.

Figure 8.18: Percent of Daily Person Miles Traveled on "Reliability-Enhanced" Modes



How Does the Plan Support Traveling to Work?

In the two years since the start of the COVID-19 pandemic in this region, commuting characteristics for many workers have changed dramatically. While many jobs classified as "essential" still required travel to a job location, many others could be or were optimized for episodic or permanent telework. It is still unclear if the long-term implications of these changes will remain, and, as a result, the TPB conducted this analysis reflective of pre-COVID-19 pandemic conditions. See Chapter 2 for more information on today's travel characteristics.

For forecasted commuting characteristics, travel model outputs suggest much of the pre-COVID-19 characteristics will likely be similar in 2045. The majority of commute travel in the outer suburbs will be dominated by single-occupant vehicle travel, commute travel in the inner suburbs will continue to be via a wide range of travel options, and in the region's core, where transit is most readily available, a much greater share of commuting trips will be taken on transit (Figure 8.19).

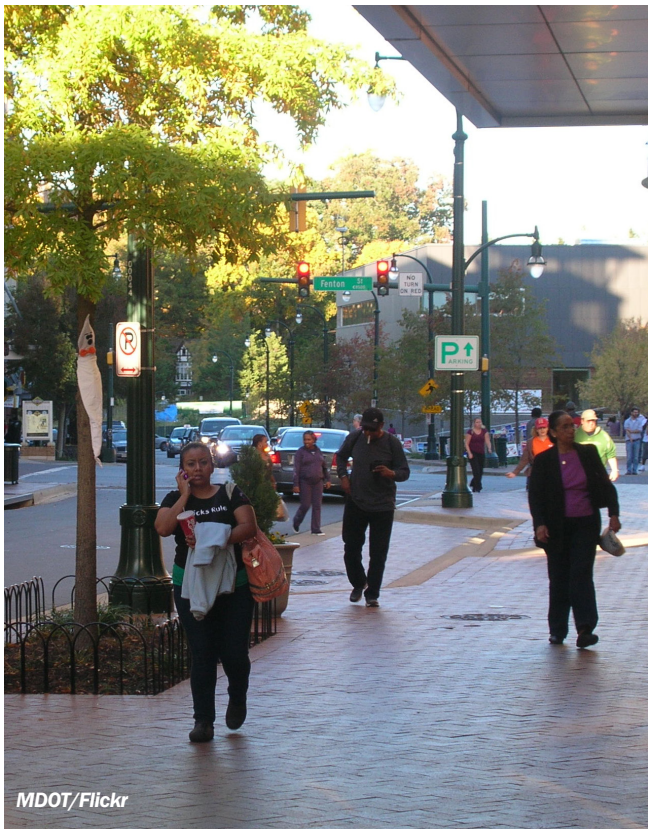
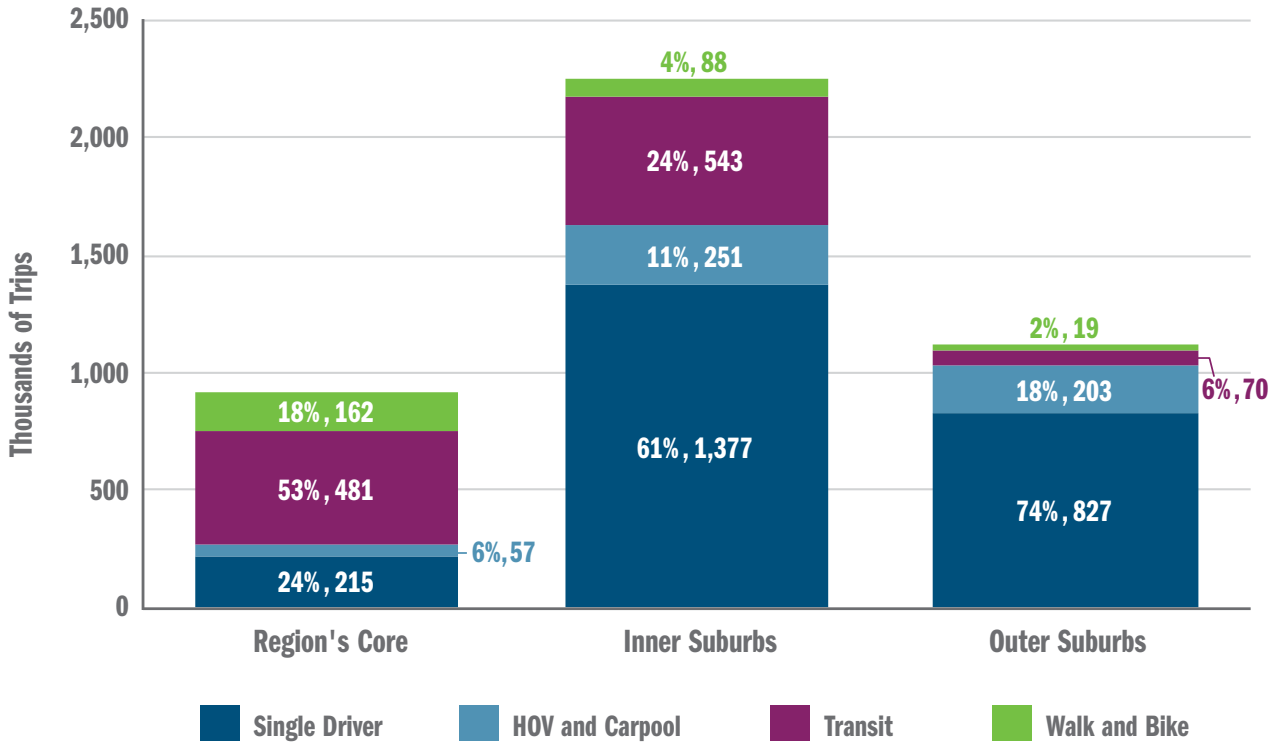

MDOT/Flickr

Figure 8.19: Work Trips by Mode and Geography, 2045



How Are New Transit Projects Forecast to Impact the Region?

The TPB's members are responding to the TPB's Aspirational Initiative to "Expand Bus Rapid Transit and Transitways" and "Move More People on Metrorail." By 2045, the region is planning to add an additional 27 percent of HCT miles compared to 2023, including additional light rail, streetcar, and bus rapid transit service. While not included in this figure, commuter rail infrastructure improvements and expansion, such as planned third and fourth tracks, will enhance existing transit service and are part of this plan. This section provides findings on how transit changes may impact the region.

Many more people and jobs are predicted to have better access to HCT (Figure 8.20).[47] In 2045, 27 percent of the region's population is forecast to live in close proximity to a HCT station, up from 18 percent today. In addition, nearly half of all jobs are forecast to be in close proximity to a HCT station, up from 41 percent today. These increases can be attributed to the additional HCT service planned for the region but also forecasts expecting more people and jobs close to these transit services.

Analyzing transit performance, through the number of jobs accessible during a 45-minute morning commute, the region is expected to see gains, and many smaller parts of the region will experience moderate gains. By 2045, the average number of jobs accessible within a 45-minute transit commute will increase from 414,000 to 553,000, a nearly 34 percent increase (Figure 8.21). Examining the geographic distribution of these changes shows that most places that currently have access to transit will experience increases in job access, and parts of the region where new transit projects are planned are also forecasted to gain access to additional jobs (Figure 8.22). These gains are likely linked to the forecast increase in jobs near existing transit stations and the expansion of higher quality transit service to more areas of the region, particularly Activity Centers and HCT station areas.

Figure 8.20: Percent of Population and Jobs in Proximity to High-Capacity Transit

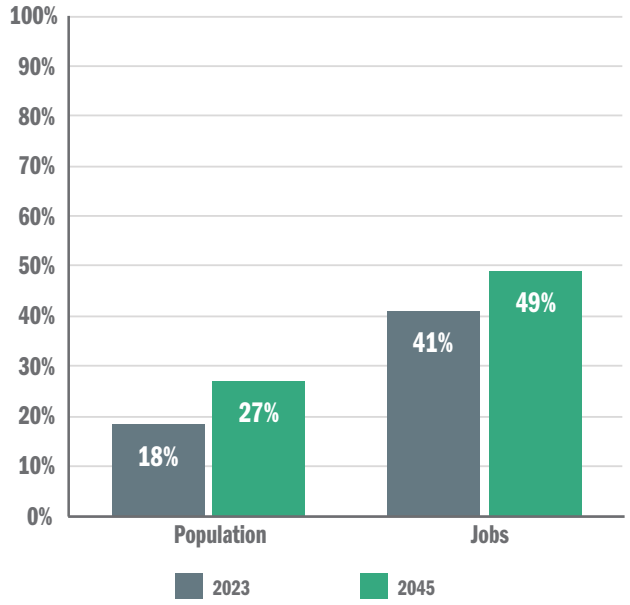
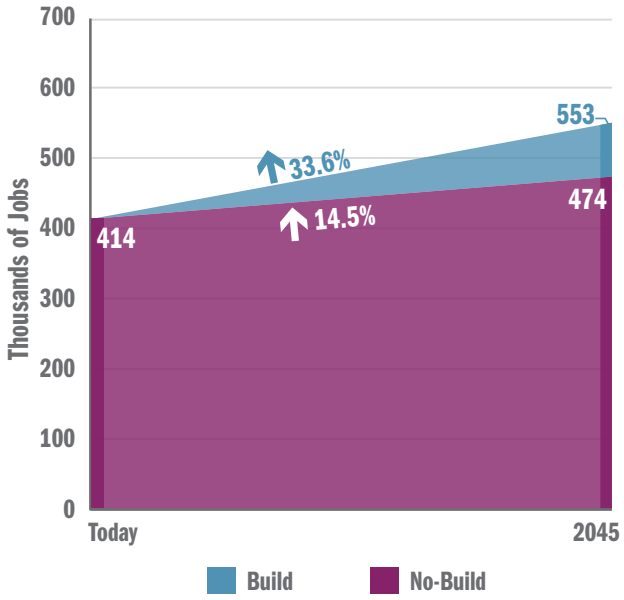


Figure 8.21: Change in Access to Jobs by Transit, Today – 2045



47 For this measure, close proximity is defined as within a half-mile of High-Capacity Transit.

Figure 8.22: Geographic Detail of Change in Access to Jobs by Transit, Today – 2045

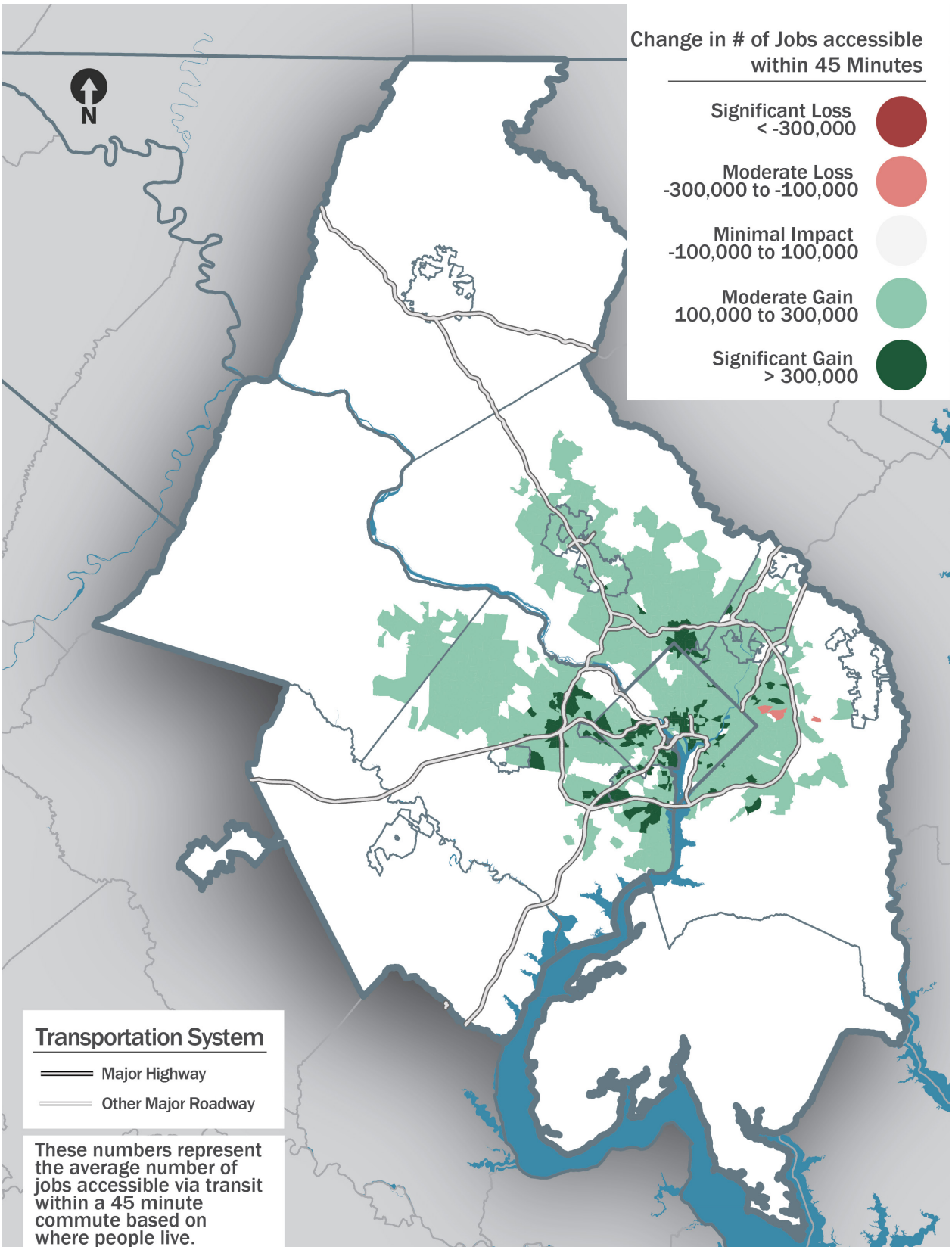


Figure 8.23: Total Daily Vehicle Hours of Delay, Today – 2045

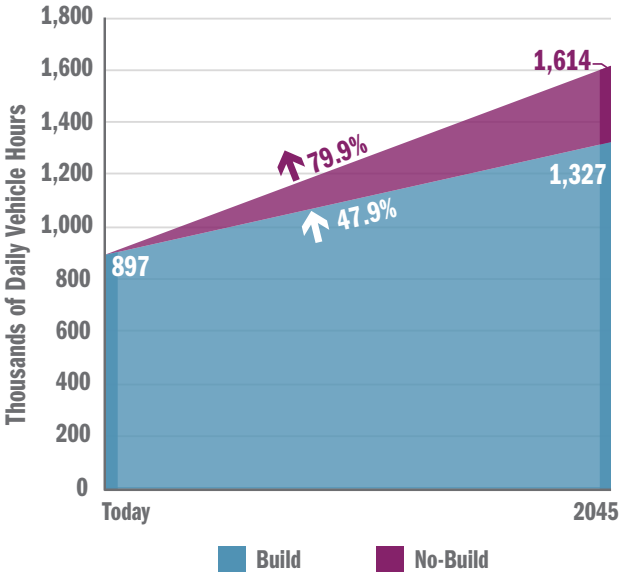
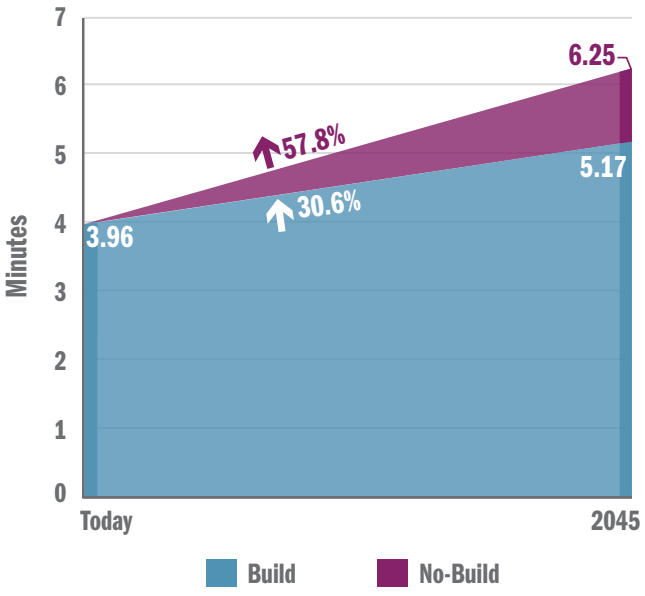


Figure 8.24: Average Minutes of Delay Per Trip, Today – 2045



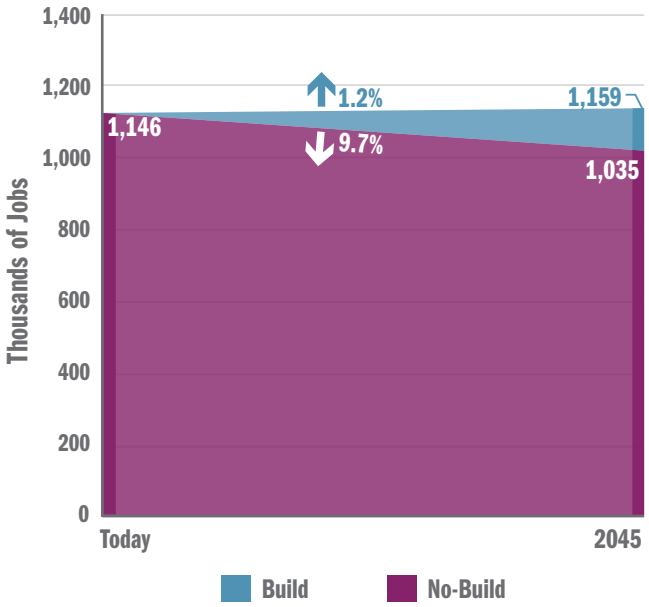
How Will the Highway Network Serve the Region?

Between today and 2045, the region's estimated increases in population and jobs, 19 and 23 percent, respectively, from 2023, will contribute to producing more trips across all modes, including single occupant vehicle and high occupancy vehicle and carpool trips. In addition, the region's financial obligations to maintain and operate the existing system limits the availability of funds for system expansions and enhancements, providing for a five percent increase in roadway miles from 2023. These increases in roadway demand and financial constraint for roadway expansion and enhancement will likely contribute to more stress on an already stressed highway network, forecasting increases in delay, congestion, and reducing access to jobs via auto for parts of the region. This is one of the reasons the TPB's documented CMP focuses on managing travel demand.

Highway congestion is forecast to get worse in the coming decades, though moderated by the projects in Visualize 2045. Even though 13 percent of the region's roadways are forecast to be congested during the morning commute in 2045, these roadways tend to be heavily used and have an outsized impact on congestion and delay.[48] Total daily vehicle hours of delay, which represents time spent in traffic in congested conditions, are forecast to increase by nearly 48 percent (Figure 8.23). A similar measure, average vehicle delay per trip, shows an increase of delay of nearly one minute and fifteen seconds or nearly 31 percent (Figure 8.24). In both metrics, by building the projects in Visualize 2045, congestion and delay are predicted to be at lower levels than if not built. Delay and congestion would have increased by nearly 80 percent and 58 percent in 2045 if projects were not built, respectively.

48 Congested is defined as a road segment with a traffic volume equal to or greater than the capacity of the road segment.

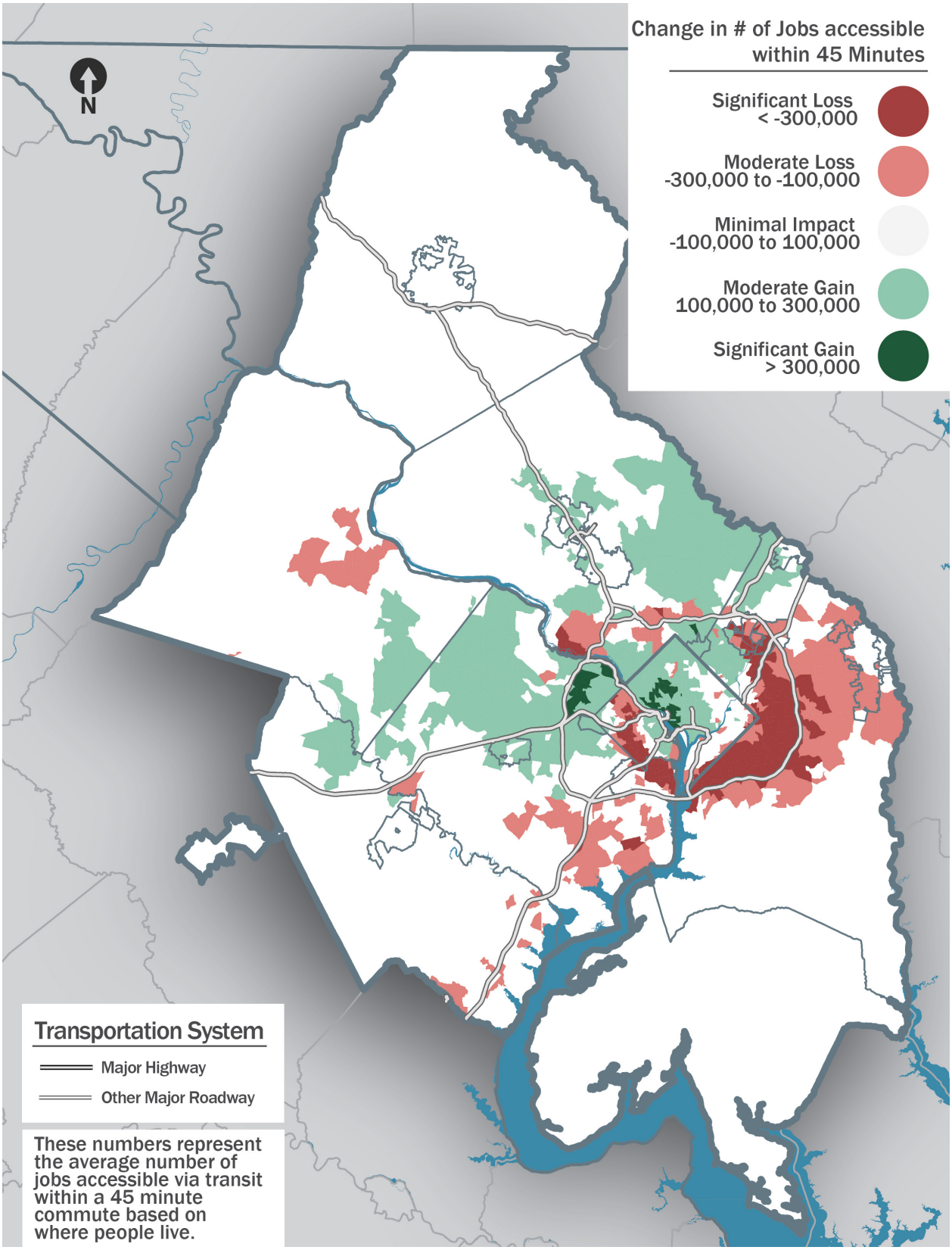
Figure 8.25: Change in Access to Jobs by Auto, Today – 2045



Analyzing roadway performance through the number of jobs accessible during a 45-minute morning commute, the region as a whole will likely see a modest gain in access while parts of the region will experience varying changes in job accessibility, from significant losses to significant gains. By 2045, the average number of jobs accessible within a 45-minute auto commute will increase by 13,000, a little over a 1 percent increase (Figure 8.25). If the region builds no new transportation projects but continues to expect increases in population and jobs, average access to jobs is forecast to decrease by nearly 10 percent for the region. These differences suggest that the transportation projects in Visualize 2045 will make a difference in providing people with access to the jobs while seeking to minimize the impact of congestion in delay.

The geographic distribution of changes in job access during a 45-minute commute in the morning is not forecasted to be equally shared in the region. The region's core, western suburbs, and northern suburbs are forecast to experience a moderate to significant gain in job access. Forecasts identify moderate to significant declines in accessibility by auto on the eastern side of the region and areas inside the Capital Beltway (Figure 8.26). Two factors are likely to contribute: The anticipated increase in congestion and delay decreasing accessibility to parts of the region by car and the additional jobs expected in this region between today; and 2045 being located largely in the western part of the region, increasing accessibility for areas near those jobs but likely reducing access to those beyond a 45-minute commute.

Figure 8.26: Geographic Detail of Change in Access to Jobs by Auto, Today – 2045

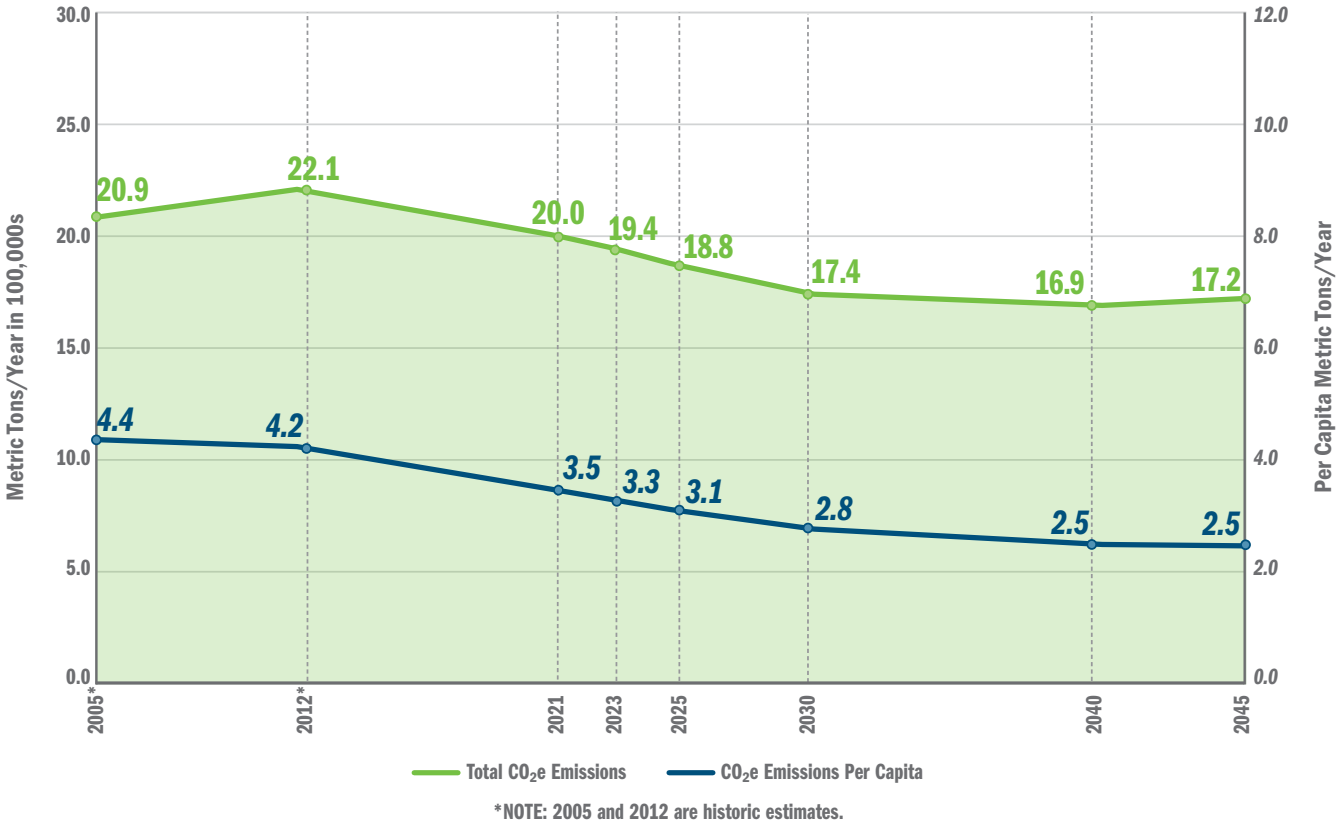


Greenhouse Gases

Unlike the two specific pollutants regulated by federal law in this region, greenhouse gases (GHGs), such as carbon dioxide, are not regulated by the federal government and are therefore not included in the Air Quality Conformity analysis. GHGs are generated by many sectors of the economy, e.g., energy, built environment, transportation, and waste. Due to the role of the transportation sector as a contributor to GHG emissions, the TPB has been tracking these emissions and has recently endorsed regional goals for reducing GHGs. Learn more about climate mitigation goals and activities in Chapters 3 and 6. In 2010, the TPB started proactively estimating and reporting future greenhouse gas mobile source emissions (as carbon dioxide equivalent or CO_2e) in the long-range transportation plan.

Since 2005, absolute annual GHG emissions in the on-road transportation sector have decreased by seven percent. By 2045, the latest analysis shows that annual GHG emissions are forecasted to be nearly 18 percent below 2005 emissions levels, or 11 percent below 2023 emissions levels, with a slight uptick between 2040 and 2045. Greenhouse gas emissions per capita are expected to decrease by 24 percent between 2023 and 2045 (Figure 8.27). The emissions reductions are largely attributed to increased fuel efficiency standards, but the uptick between 2040 and 2045 occurs as cleaner vehicles have saturated the fleet, and the benefits from fuel efficiency standards can no longer keep pace with projected VMT increases.

Figure 8.27: 2022 Update to Visualize 2045 Greenhouse Gas Mobile Source Emissions CO_2e and CO_2e Per Capita



*Since the TPB adopted the 2018 plan, the historic 2005 GHG emissions estimates were re-benchmarked using updated tools and planning assumptions and are consistent with both COG's 2030 Climate Energy and Action Plan and the TPB's Climate Change Mitigation Study of 2021. Therefore, the data varies slightly from past reporting.

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Geoff Livingston/Flickr

9

CHAPTER

What Happens Next?

Through this plan, our region Visualizes its Future Together. What will it look like? What challenges does the region face, and how does it work together to overcome them? This section looks back at progress, and reflects on challenges of the present moment and years ahead. It looks forward to actions needed to achieve the desired outcomes outlined in TPB goals, while continuing to meet the federal requirements for metropolitan planning.

LOOKING BACK TO LOOK AHEAD

The Washington region's transportation system has come a long way in 20 years, now we look ahead. We visualize our future by planning how we get there, together.

Looking Back

The TPB has set goals and developed strategies to achieve them. The region's agencies have applied the strategies as appropriate to local context and have worked together to implement projects that span jurisdictional borders to connect the region. **Over the last few decades in the metropolitan Washington region, major investments have been made to provide more transportation options to residents, businesses, and visitors.** Significant investments have been made in public transit as

well as bicycle and pedestrian infrastructure. New Metrorail stations and lines have been built. The Silver Line connects Largo Center to stations across DC, into Fairfax County—and soon, Loudoun County, opening up job access and bridging the East/West divide. The NOMA-Gallaudet station, once an idea, now serves a new thriving neighborhood near major job centers. An ever-increasingly connected trail network enables people to bike from Montgomery County to National Harbor or Alexandria, almost entirely on trails. The Wilson Bridge was replaced with a facility that now serves all types of travel. More recently, a new multimodal Frederick Douglass Memorial Bridge replaced an aging structure over the Anacostia River, improving access to DC. New BRT and transitways have opened in Arlington County, Montgomery County, and DC, with many more planned. Expressways have been and continue to be added to the roadway system to enhance reliability. Investments in operations technologies and management help move and smooth traffic without adding roadway capacity. Road diets are a common way to make streets safe for everyone. Complete Streets are expected, not an anomaly.

Elvert Barnes/Flickr

The Present Day: Tracking Progress

The people, businesses, and visitors in the region look for a range of transportation options that meet their individual needs, that are safe, reliable, and easy to access. Together, the region plans and takes actions to realize a brighter future, with a transportation system that does its part to help the region thrive. **Although some challenges that are common in a growing region still remain, the region has made incredible improvements and continues to do well in many areas.** The Regional Transportation Survey reports that approximately 17 million trips are taken per day on all modes of transportation for all purposes, including travel to work, school, medical appointments, and other destinations. Over the past 10 years, for all trip types, bicycling has doubled, walking amounts remained steady, but transit use declined. For commute trips, shares of single occupancy vehicle and carpool trips decreased while other modes such as bus transit, walk, bicycle, and taxi/ridehail increased.

Air quality has improved dramatically. Based on the ozone and fine particles data from the air quality monitors, the air quality in our region has improved tremendously over the past 20 years and is expected to continue to improve into the future. As more and more workers have the option to work from home, teleworking has changed the landscape of transportation in this region by reducing the total number of people commuting to work, and telework has seen pandemic-fueled growth.

Looking Ahead

The TPB's transportation system performance forecast for 2045 shows, as the population and jobs increase in the region, they are expected to be increasingly guided into mixed-use developments in Activity Centers and near HCT station areas, as they have over the last 20 years. Already high access to transit and nonmotorized opportunities is forecast to improve further for most residents of our region. More people are expected to travel by carpool, transit, biking, and walking. A higher

Mark Levisay/Flickr

THE POWER OF WORKING TOGETHER

The region has made progress toward its goals, but challenges remain. While we have further to go, together, we'll go far.

percentage of our region's residents is expected to take advantage of the congestion-free travel on the more reliable high-capacity transit, nonmotorized, and express lane modes. TPB surveys show that if given the choice to return to a work location once the COVID-19 pandemic is over, two-thirds said their preference would be to telework some days and 38 percent said they will probably have different travel habits than before.

But, the performance analysis also shows, given the additional demand of more people and jobs added to current demand, delay and congestion on main travel corridors will continue to rise—but more slowly than if the transportation investments were not made. Reducing GHG emissions poses a challenge. Many people still lose their lives or are injured on the region's roadways. The combined cost of housing and transportation puts a strain on the region's residents quality of life.

Transportation agencies must spend about 81 percent of their budgets to maintain and operate the existing expansive system, with remaining funding called on to integrate its many parts, expand options, and improve safety, mobility, access and reliability for all. Together, our region can explore how to generate new funding and maximize existing funding.

When agencies develop projects, they need to- and do-address more than one goal area. But, projects can also make progress on a policy priority (such as improved mobility for historically disadvantaged populations) while hindering another priority, such as reducing VMT and GHG. Overcoming challenges of funding, lengthy project development timelines, and the other hurdles of enhancing a transportation system in a region that is already built out, means implementation faces many challenges.

Over the last decade, the TPB's numerous studies have pointed toward multimodal solutions to address challenges, alleviate congestion, improve reliability and safety, reduce transportation emissions, and provide real choices for people and businesses across the region. These studies led to the TPB-endorsed Aspirational Initiatives—planning concepts already underway in the region that the TPB seeks more of, sooner, as they have the potential to significantly improve the region's transportation system performance compared to past plans and programs.

During the development of this plan, the TPB conducted activities to support the implementation of the Aspirational Initiatives to address the TPB's entire policy framework, including a survey that explored potential impacts of the pandemic, transportation barriers and preferred enhancements. The TPB conducted focus

groups to hear perspectives of underrepresented populations, and, a QR-code based event to better understand how the types of projects aligned with the initiatives impact people's lives. We heard that these projects make a real difference, and that the TPB needs to keep making progress on its aspirations.

The TPB conducted studies that focused on issues that impact the region's ability to address many of its goals—equity, roadway safety, and climate change mitigation and resiliency. Each study identified key challenges and strategies to make progress. For example, the Transit Fare Equity study found that fare relief can increase ridership, could reduce the cost burden for many riders, and improve the safety of riders and operators. The TPB Safety Study revealed that EEAs contain 42 percent of the urban core's population, yet they account for 59 percent of the urban core's fatalities and identified strategies to reduce fatalities and injuries that occur on the region's roadways. The *Climate Change Mitigation Study of 2021* found no silver bullet to meet the region's 2030 interim and 2050 climate goals, but identified the potential impacts of numerous multisectoral pathways that could help the region reduce the amount of GHG spilled into the air from transportation emissions.

THE KEY TO SUCCESS

The region identifies and works together to overcome challenges, whether they be regional, national, or global.

Together, Our Region Can Take Action

This plan includes many projects, programs, and policies that advance TPB policy priorities, including the Aspirational Initiatives. But there's more to do.

With challenges ahead, the region needs to prepare for the additional growth that we know is coming. As noted in COG's *Region United* planning framework, which builds on several of the Aspirational Initiatives and other TPB efforts, "it is clear that our region needs to take collaboration to the next level to address a variety of interconnected and urgent challenges more effectively, including housing supply and affordability, transportation accessibility and mobility, climate change—as well as long-persisting racial inequities. And while these issues are daunting, there's also growing consensus: if the challenges are interconnected, so are the solutions."

While studies have informed solutions, the **TPB and COG are focused on strategy implementation.** Together, our region is bringing the slogan, 'Think Regionally, Act Locally' into action. Each jurisdiction and agency can take action by identifying the region's priority strategies that work best at the local level and where possible, take steps to accelerate delivery. How projects, programs, and policies are implemented also matters, COG and the TPB call for strategies to have an equity lens. Recognizing that getting the most out of every dollar is necessary, planning and implementation activities can include considering how each investment can become an interconnected solution by examining opportunities to incorporate climate, land use, and other strategies into each solution.

Together, our region can continue to make headway on its goals as it establishes policies and makes investments in programs and projects for future generations.

When We Plan Together, We Prosper, Together.

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