



# 2040 Maryland

## TRANSPORTATION PLAN

**Connecting You to  
Life's Opportunities**

January 2019

**MDOT**  
MARYLAND DEPARTMENT  
OF TRANSPORTATION

Larry Hogan  
Governor

Boyd K. Rutherford  
Lt. Governor

Pete K. Rahn  
Secretary



## Message from Governor Larry Hogan

Our administration is committed to maintaining and improving Maryland's transportation infrastructure and ensuring that our transportation investments move the State's economy forward by creating jobs and expanding opportunities for all Marylanders. Whether you walk, drive, bike, fly, cruise, or take transit, the Maryland Department of Transportation's (MDOT) 2040 Maryland Transportation Plan (MTP)

will help ensure a transportation system that gets you where you need to go, now and into the future. It provides a vision that clearly outlines our goals, objectives, challenges, and priorities for building a safe, interconnected transportation network. It offers a strategic roadmap for transportation in Maryland that helps guide statewide investment decisions across all modes of transportation.



## Message from Transportation Secretary Pete K. Rahn

Maryland's transportation system is growing in new and exciting ways, better connecting our communities to economic opportunities and innovative technologies. Governor Larry Hogan truly knows what it means to be in tune with Maryland's needs. His direction has helped the Maryland Department of Transportation (MDOT) gain a clear understanding of how we can continue growing and thriving as a State.

MDOT has made amazing strides in implementing transportation initiatives and improvements over the last four years. The Purple Line is well on its way to linking Prince George's and Montgomery Counties, giving us another opportunity to increase travel choices for our residents and visitors. Continued Port of Baltimore investment has led to exceptional cargo efficiency and new records in the number of containers that move through the Port, as well as the ability to service larger ships that travel through the Panama Canal. MDOT is leading the largest Public-Private Partnership (P3) highway project in North America with the Traffic Relief Plan (TRP), which will improve the movement of people and goods on critical commuting roadways in Maryland.

Maryland is able to move forward with an unprecedented level of investment by using innovative methods that allow us to deliver projects faster and at a lower cost, operating a first-rate transportation system involves more than asphalt and signage. At the heart of the transportation system are the people who use it - our customers. This includes anyone who has ever been through the Baltimore-Washington International Thurgood Marshall Airport (BWI), driven along I-270, rode on a MARC train or an MDOT Maryland Transit Administration (MDOT MTA) bus, or used one of many bike paths throughout the State. We continue to modernize and improve services to our customers, such as automating truck permitting and making it easier for shippers and carriers to do business in our State.

Thanks to Governor Larry Hogan's vision and coupled with extensive input from transportation users and citizens across the State, I am excited to present MDOT's 2040 Maryland Transportation Plan (MTP). Through measureable goals and objectives, the MTP establishes a 20-year blueprint to guide Maryland in making strategic transportation investments to better connect our State to the jobs and opportunities of a global economy.

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# Introduction

The 2040 Maryland Transportation Plan (MTP) sets a long-range course for investing in the State's transportation system that will help ensure Maryland remains a great place to live, work, and do business.

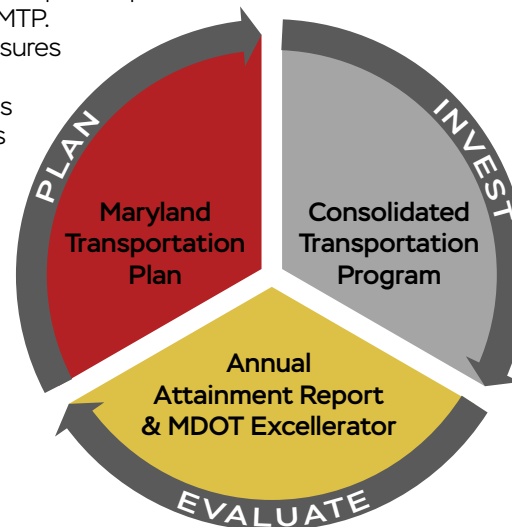


## MISSION STATEMENT

**"The Maryland Department of Transportation is a customer-driven leader that delivers safe, sustainable, intelligent, and exceptional transportation solutions in order to connect our customers to life's opportunities."**

The MTP examines the State's most critical transportation needs and challenges, provides a framework for statewide goals and objectives, and identifies strategies to help MDOT meet the goals. The Maryland Department of Transportation (MDOT) updates the MTP and the Maryland Bicycle & Pedestrian Master Plan concurrently every five years. The Maryland Department of Planning (MDP) is also updating the State's development plan, A Better Maryland, which considers the strategies identified in the MTP. Feedback provided through the development plan process was also considered in the development of the MTP. The MTP is performance-based, which means it uses measures to help gauge progress toward the goals and objectives. These measures are developed in tandem with the MTP as part of MDOT's annual Attainment Report (AR). The MTP's 20-year vision informs Maryland's six-year Consolidated Transportation Program (CTP), which programs funding for individual transportation investments.

MDOT assesses its performance in meeting its goals and customer needs through the annual AR and the quarterly MDOT Excellerator performance management system and participates in the State's annual Managing for Results (MFR) budget process which is designed to ensure measurable results, accountability, efficiency, and continuous improvement for all State programs.



## MDOT EXCELLERATOR TANGIBLE RESULTS:

1. Provide exceptional customer service
2. Use resources wisely
3. Provide safe and secure transportation infrastructure
4. Deliver transportation solutions and services of great value
5. Provide an efficient, well-connected transportation experience
6. Communicate effectively with our customers
7. Be fair and reasonable to our partners
8. Be a good neighbor
9. Be a good steward to our environment
10. Facilitate economic opportunity in Maryland



Provide Better Transportation Choices and Connections



Ensure a Safe, Secure, and Resilient Transportation System



Facilitate Economic Opportunity and Reduce Congestion in Maryland through Strategic System Expansion



Promote Fiscal Responsibility



Ensure Environmental Protection and Sensitivity



Improve the Quality and Efficiency of the Transportation System to Enhance the Customer Experience



Maintain a High Standard and Modernize Maryland's Multimodal Transportation System

# MTP GOALS

The 2040 MTP sets a long term foundation for MDOT's performance management and project programming activities over the next five years.

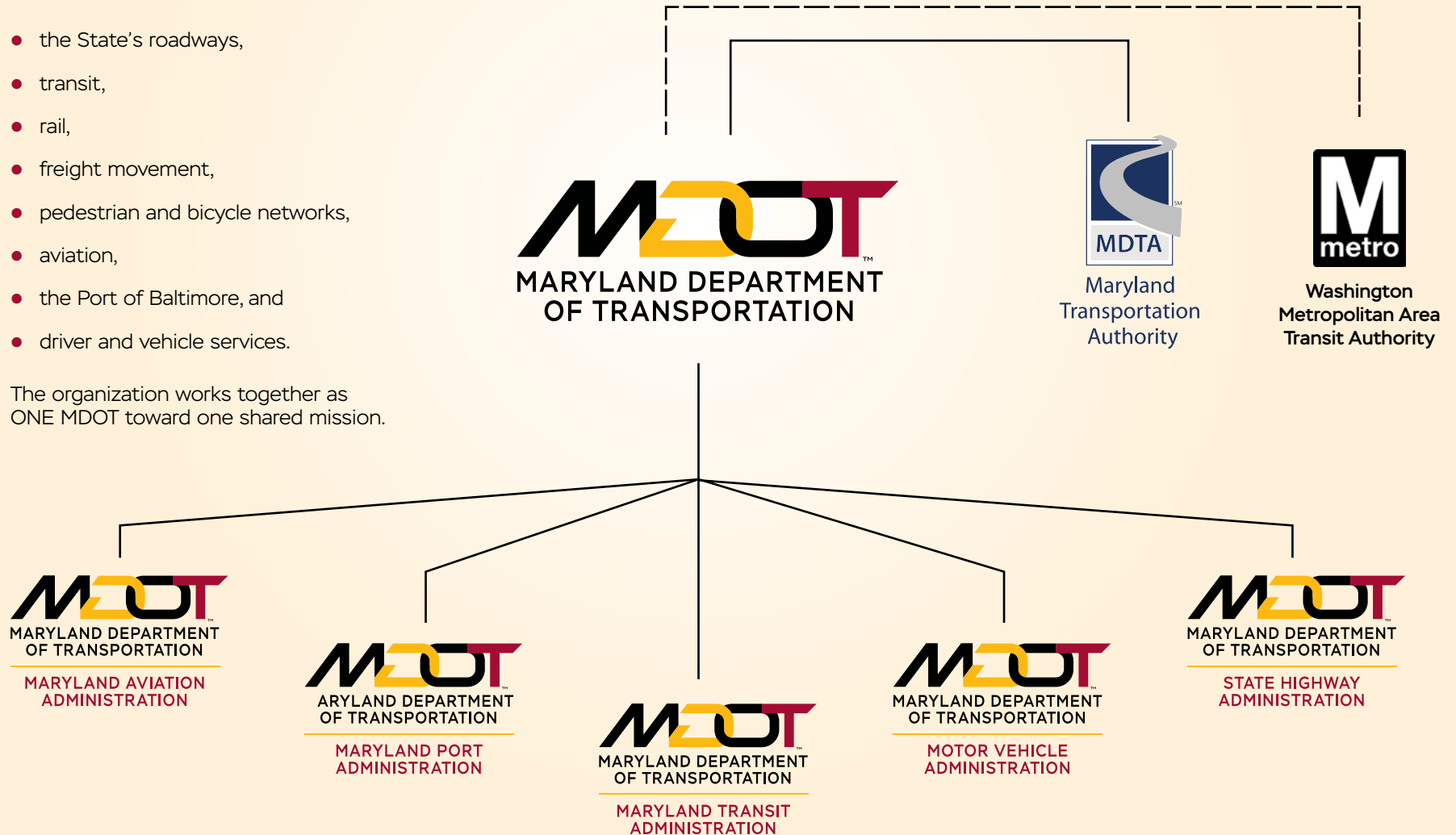
# What is MDOT?

The Maryland Department of Transportation (MDOT) has five Transportation Business Units (TBUs) and one Authority. MDOT's Secretary is the Chairperson of the Maryland Transportation Authority (MDTA), and MDOT financially supports the Washington Metropolitan Area Transit Authority (WMATA).

MDOT is responsible for statewide transportation planning across all modes including:

- the State's roadways,
- transit,
- rail,
- freight movement,
- pedestrian and bicycle networks,
- aviation,
- the Port of Baltimore, and
- driver and vehicle services.

The organization works together as ONE MDOT toward one shared mission.



# Maryland's Major Statewide Transportation System



**17,143**  
state maintained lane  
miles of roadways



**2**  
state airports



**9**  
toll facilities



**66**  
local bus routes, one light  
rail line, one metro line



**38**  
commuter  
bus routes



**24**  
MDOT MVA  
Service  
Locations

**18**  
Maryland Vehicle  
Emissions Inspection  
Program Stations



**700**  
miles of sidewalks  
along MDOT SHA-  
owned roadways



**68**  
MDOT SHA-  
owned  
bicycle lanes



**343**  
Maryland  
rail-trail  
miles



**171**  
miles of short line  
freight rail and  
Maryland Area Regional  
Commuter (MARC)  
rail service



**7**  
State-owned  
public cargo  
terminals



**1**  
international  
cruise terminal  
at the Port of  
Baltimore

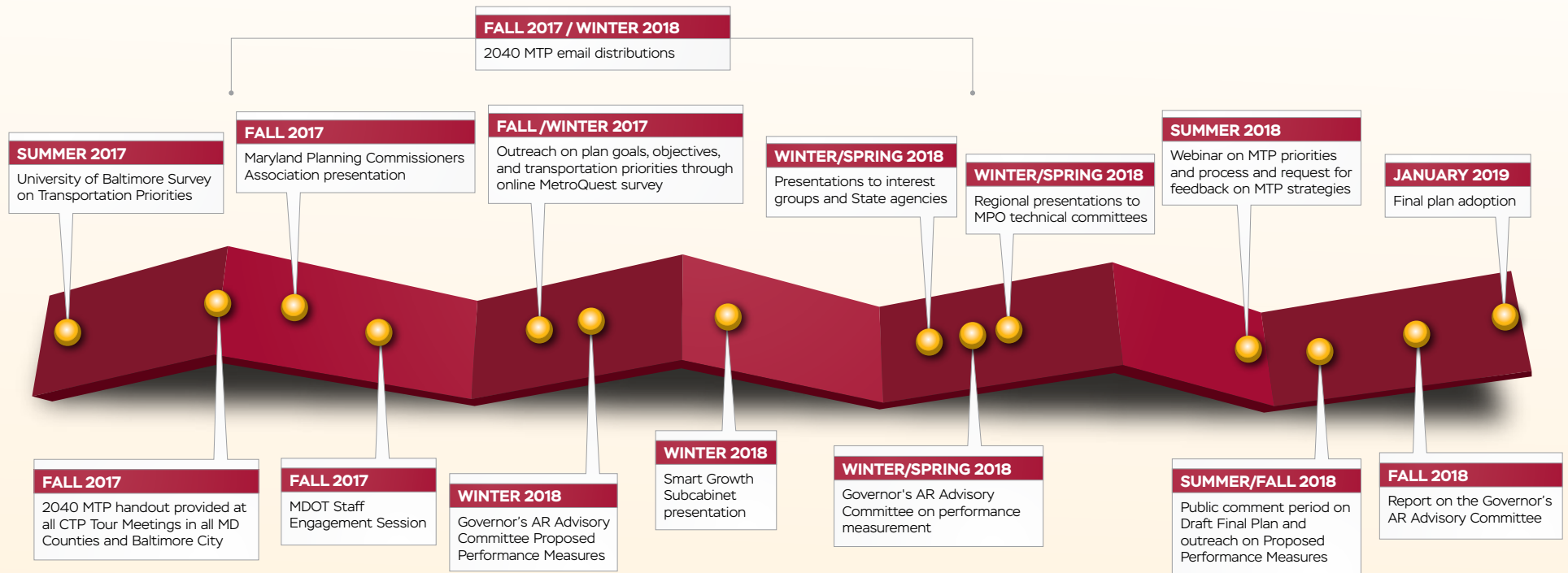
MDOT also supports 33 public use airports in the State through federal grant programs, provides technical assistance for transit systems in 23 counties, and is a funding partner of the regional Washington Metropolitan Area Transit Authority (WMATA).

# Engagement Process

As part of the MTP process, MDOT conducted extensive engagement both internally throughout MDOT and externally with its local, state, and regional planning partners and the wider public. Throughout the MTP development process, MDOT discussed key milestones with

the MDOT Planning Council, which is comprised of planning directors from each of the TBUs and the Authority. MDOT also coordinated with partners and the public via a project website ([www.mdot.maryland.gov/mtp](http://www.mdot.maryland.gov/mtp)), email updates, social media posts, a project web

video, an online survey, a phone survey, and presentations to groups throughout Maryland. The timeline below illustrates the engagement process for the 2040 MTP.



Online survey in English and Spanish live for one and a half months



**5,927**  
online survey participants



**4,341**  
comments



Participants from all five regions of the State



**66**  
MDOT employees from all 5 TBUs, one Authority, and MDOT The Secretary's Office participated in one full day Engagement Session

The public's top three priorities identified in the online survey are:



**Travel reliability**



**System maintenance**



**Safety and security**

# Maryland's Five Regions

Though Maryland is the ninth smallest state, it contains a remarkable degree of geographic diversity. Reflecting that diversity, Maryland is divided into five regions – Eastern Shore, the Baltimore Metro Region, the Washington Metro Region, Southern Maryland, and Western Maryland. Each of the regions has its own character, distinct needs, and associated transportation system.





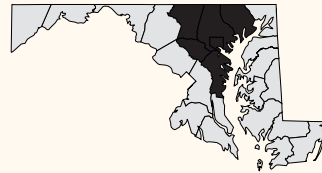
## WESTERN MARYLAND

- Mostly rural
- Characterized by forested mountain ridges, some agriculture, small towns, and the cities of Hagerstown, Frostburg, and Cumberland
- State's least populous region
- Eastern portion of Western Maryland faces development pressures as people search for newer development at lower cost, but still within commuting distances of Washington, D.C.
- Population:  
252,000 (2016)  
297,000 (2040) ▲18%



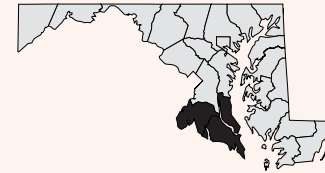
## WASHINGTON METRO REGION

- Suburban counties outside Washington, D.C.
- Primarily suburban with newer dense urban nodes and transitions into medium-to-low density suburban areas
- City of Frederick has a moderately dense historic town center
- Rapid suburban growth along the I-270 corridor, especially in southern Frederick County
- Population:  
2.2 million (2016)  
2.5 million (2040) ▲14%



## BALTIMORE METRO REGION

- Baltimore City and its surrounding counties, includes Annapolis, the State capital
- Land use is varied with dense historic urban cores in Baltimore and Annapolis
- Transitions into medium-to-low density suburban areas
- Becomes progressively more rural as one moves towards the periphery of the region
- Population:  
2.7 million (2016)  
3 million (2040) ▲9%



## SOUTHERN MARYLAND

- In terms of percent growth, projected to be the fastest growing region in Maryland
- Rapid, low-density suburbanization is a key land use feature
- Growth attributable to expansion of employment opportunities within the region and influx of people who work in the Washington, D.C. region
- Population:  
361,000 (2016)  
474,000 (2040) ▲31%



## EASTERN SHORE

- Relatively flat and predominately rural
- Thriving agriculture industry, including large poultry farms
- City of Salisbury is a center of agriculture industry
- Tourism is also important on the Eastern Shore, especially for the beach town of Ocean City
- Population:  
454,000 (2016)  
562,000 (2040) ▲24%

# Trends and Considerations

Demand for travel is directly tied to population, employment, density, and demographics. Population and employment growth adds daily trips that the transportation system needs to accommodate. Where people live, how they travel to work, and their stage of life all influence travel demand in Maryland.

## PORT OF BALTIMORE FOREIGN CARGO TONNAGE

**31.8M** ▼ 3.0%  
2016 CY (2010-2016)

## POPULATION

**6.0M** ▲ 4.4%  
2016 CY (2010-2016)

## EMPLOYMENT

**3.6M** ▲ 6.2%  
2015 CY (2010-2015)

## REGISTERED VEHICLES

**5.1M** ▲ 4.9%  
2016 FY (2010-2016)

## LICENSED DRIVERS

**4.3M** ▲ 4.8%  
2016 FY (2010-2016)

## MDOT MVA TRANSACTIONS

**11.1M** ▲ 0.8%  
2016 FY (2010-2016)

## ELECTRIC VEHICLE REGISTRATIONS

**6,788** ▲ 1014.6%  
2016 CY (2012-2016)

## ANNUAL VEHICLE MILES TRAVELED (VMT)

**60B** ▲ 6.6%  
2017 CY (2010-2017)

## ANNUAL VMT PER CAPITA

**9,802** ▲ 0.9%  
2016 FY (2010-2016)

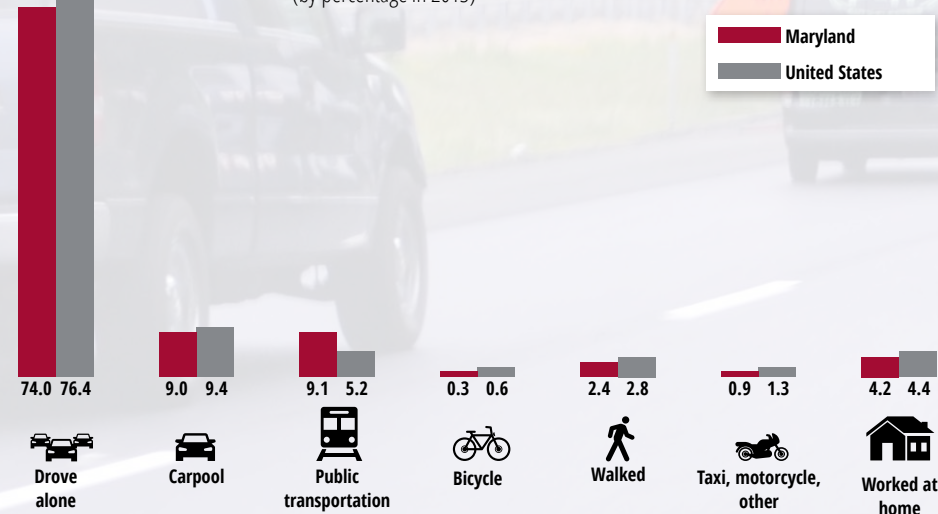
## ANNUAL TRANSIT RIDERSHIP

**260.8M** ▼ 8.6%  
2016 FY (2010-2016)

## AIR CARRIER EMPLANEMENTS

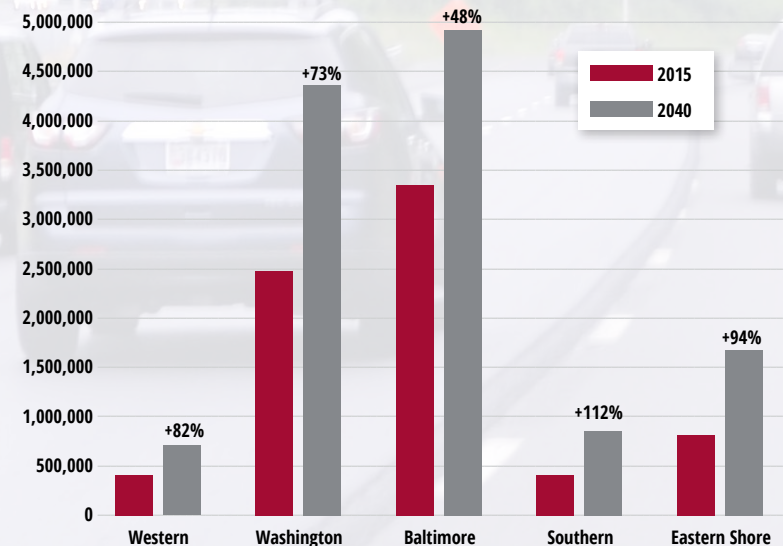
**25.1M** ▲ 14.6%  
2016 CY (2010-2016)

## How Marylanders Get to Work (by percentage in 2013)



Source: State Transportation Statistics, 2015, prepared by the US Department of Transportation Bureau of Transportation Statistics

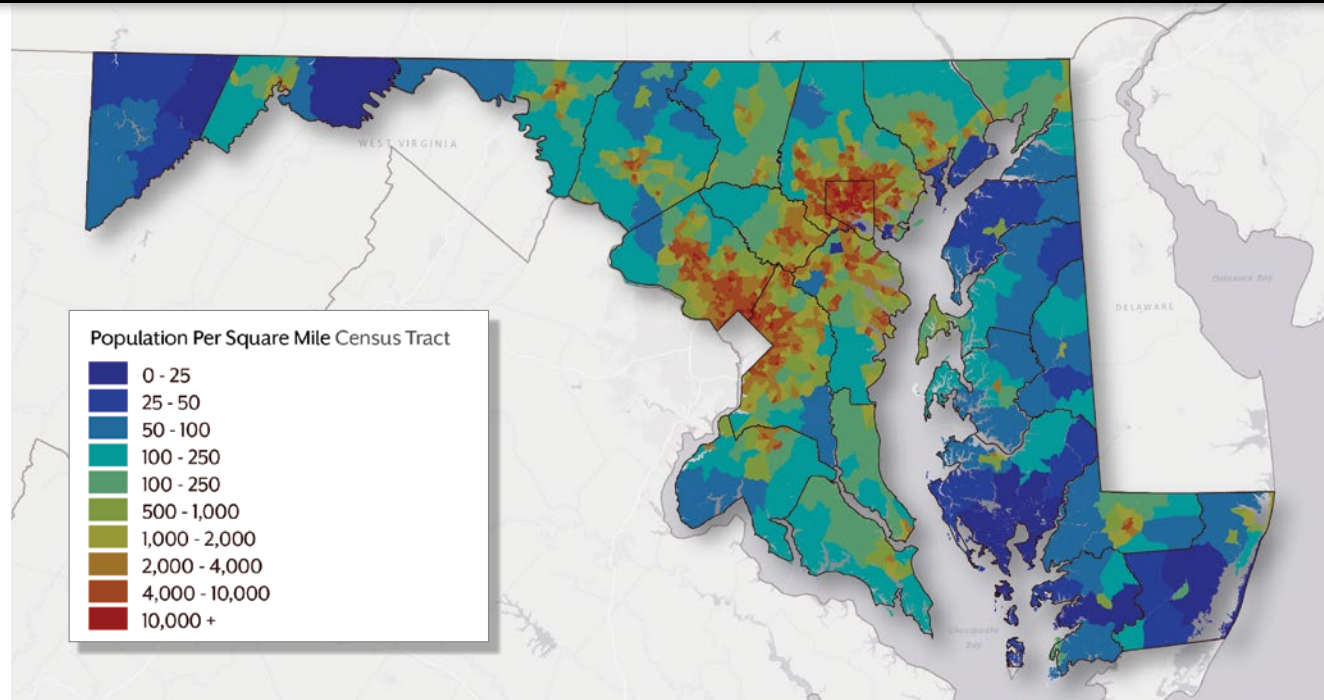
## Vehicle Hours of Travel (by Region)



Source: Maryland Department of Transportation State Highway Administration, MSTM V1.1

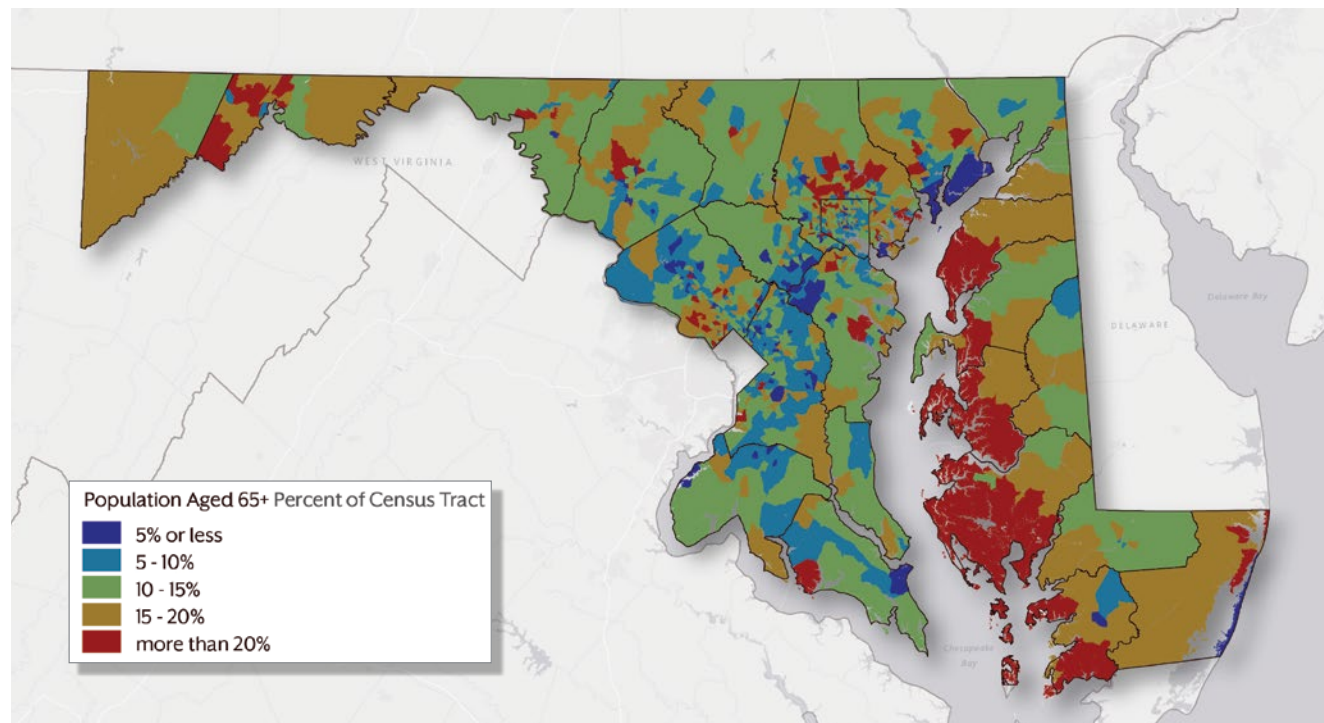
## MARYLAND POPULATION DENSITY BY CENSUS TRACT, 2015

- Population is concentrated in central Maryland along the I-95 corridor and along radial lines extending out from Washington, D.C.
- More than 82 percent of the State's population lives in the Baltimore and Washington Regions

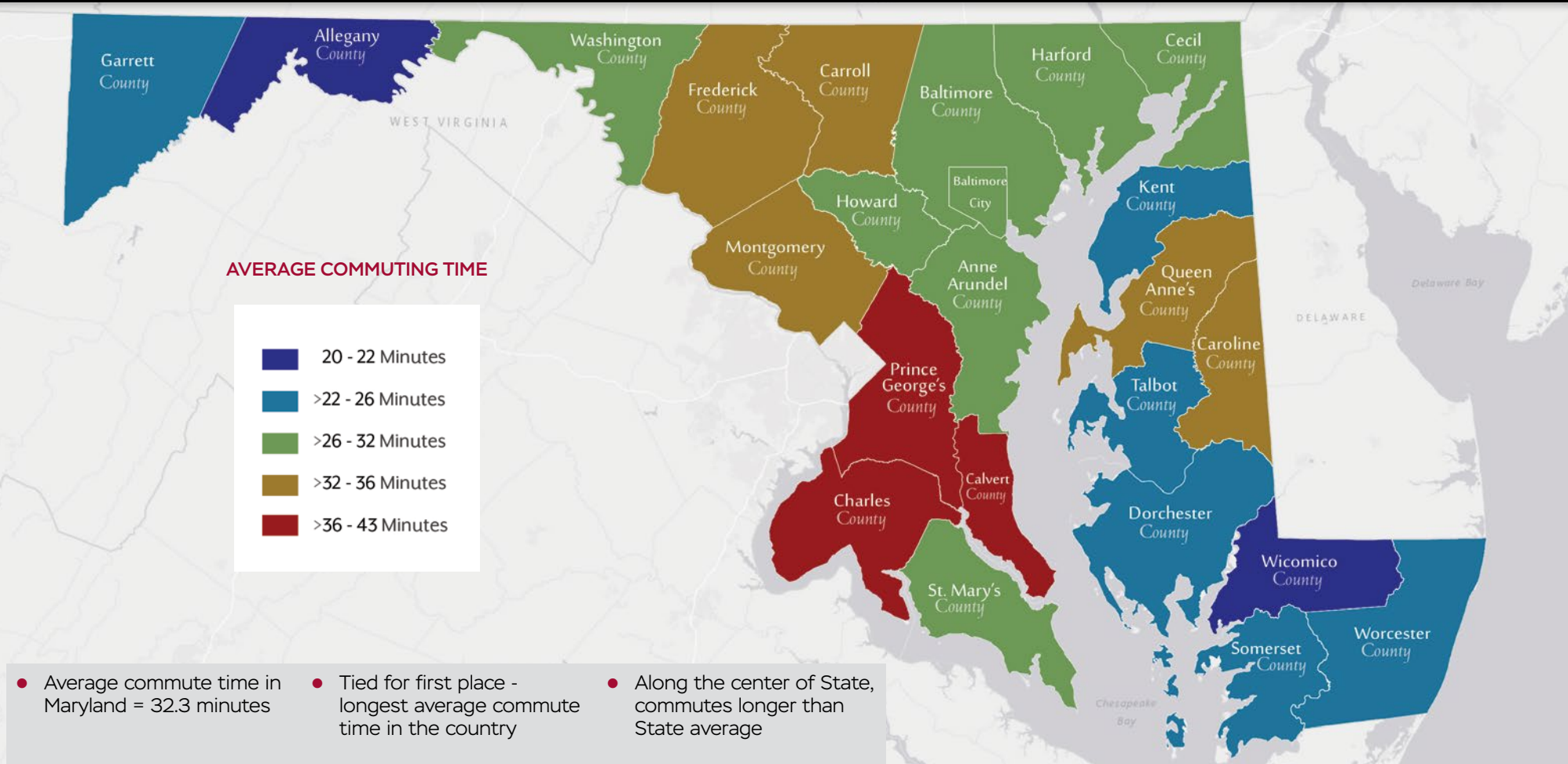


## MARYLAND POPULATION AGED 65+, 2010

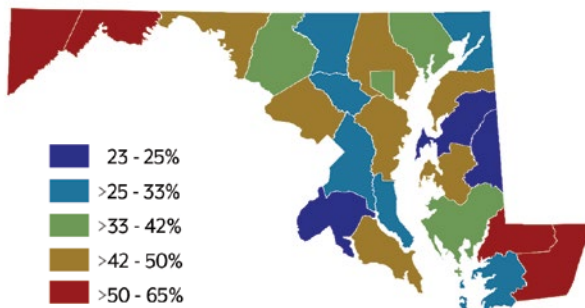
- Maryland's population is getting older
- 65+ population grew by 24% between 2010 and 2016
- Rural areas have higher concentrations of older residents



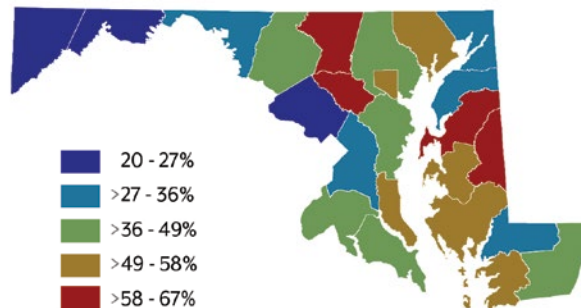
# Average Commuting Times and Destinations by County



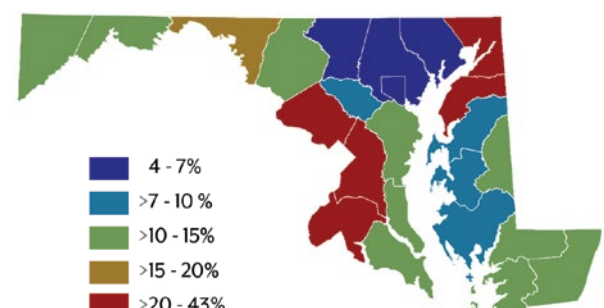
## PERCENT COMMUTING WITHIN COUNTY



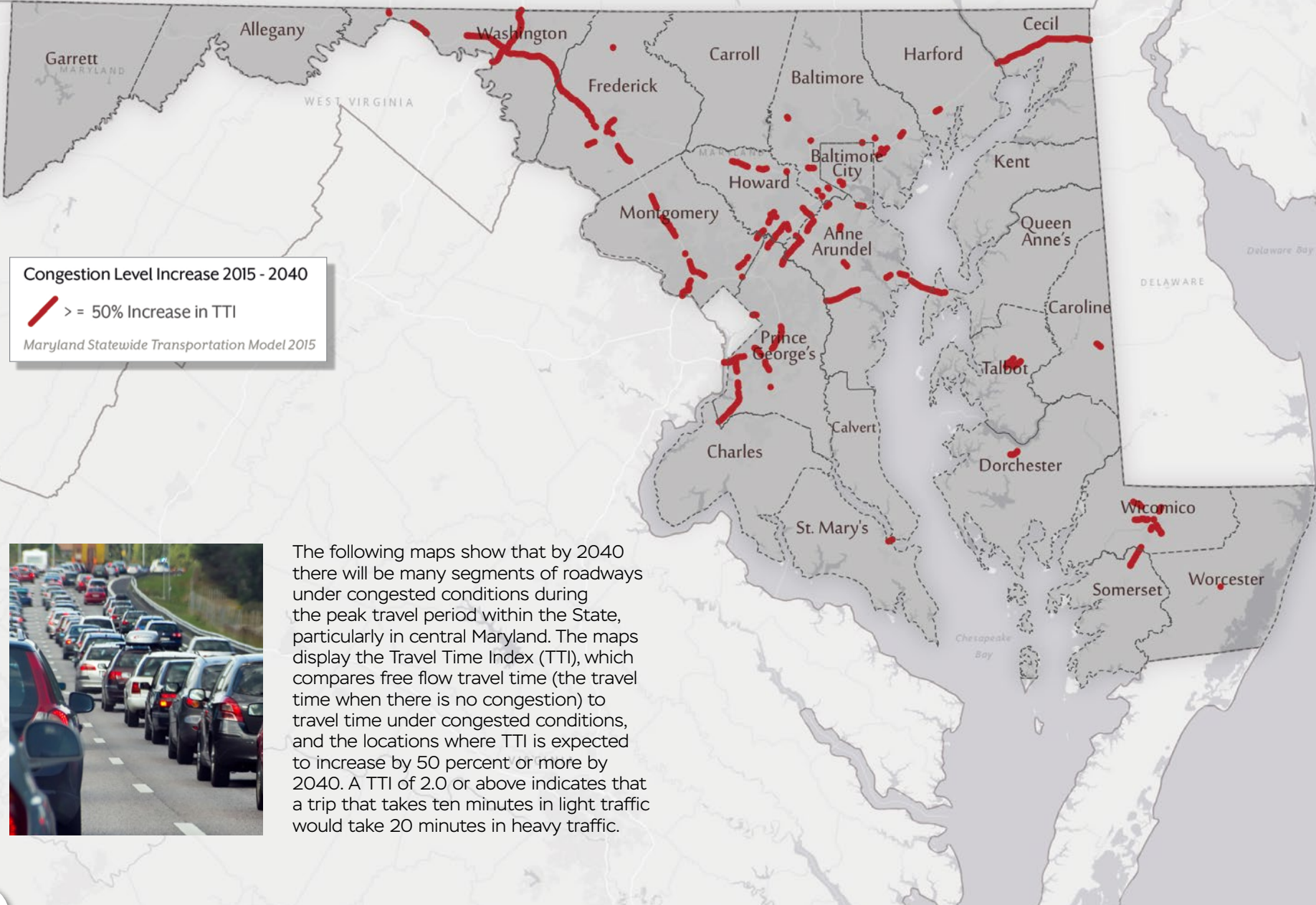
## PERCENT COMMUTING TO ANOTHER COUNTY



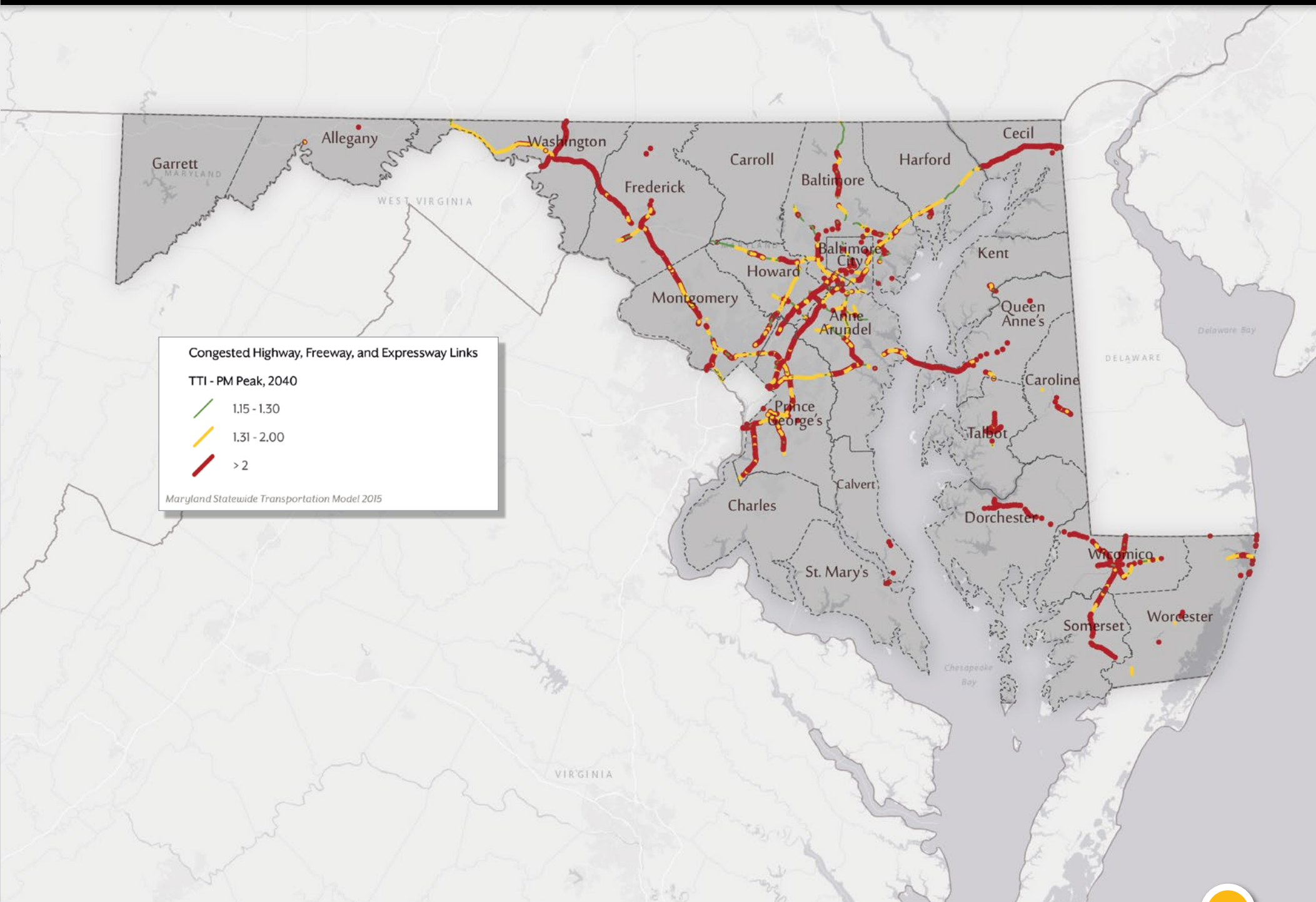
## PERCENT COMMUTING OUT OF MARYLAND



## Maryland Congestion Trends



# Maryland Congestion Trends



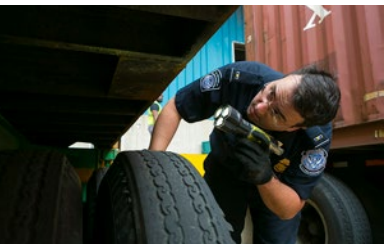
# Maryland's Transportation Challenges and Opportunities

Maryland's extensive, multimodal transportation network faces a number of challenges and opportunities. Some are inherent to the network itself – continuing to ensure the safe and efficient movement of people and goods – while others are related to changing transportation needs associated with technological, societal, demographic, land use, climate, and other environmental changes. An increasing number of residents and employers in the State will generate additional revenue, but they will also demand services, including transportation services, which could require increased spending. The impact of transportation-related technological changes such as connected and automated vehicles (CAV), electric vehicles, and the shared mobility economy is unknown. Under some scenarios they provided profound benefits. In others, they generate lasting damage. As Maryland sets its transportation agenda for the next 20 years, MDOT will monitor and evaluate the challenges and develop programs and projects that address these critical challenges and ensure Maryland remains a great place to live, work, and do business.



## **SAFETY**

Maryland's ultimate safety goal is to work Toward Zero Deaths in the long term. Creating a resilient transportation network and preparing for changing conditions, whether environmental or man-made threats, is another important safety challenge.



## **SECURITY**

Security of the transportation system has been an important aspect of transportation planning for state DOTs. The introduction of new technologies increases the importance of cybersecurity. The convenience of digital motor vehicle transactions also increases the risk of exposing customer data to cyber-security attacks.



## **AGING INFRASTRUCTURE**

Maintaining and modernizing Maryland's road and bridge infrastructure requires continuous and significant investment in an asset management program that forms the core of MDOT's transportation strategy.

## **CONGESTION**

Much of Maryland's transportation system often operates at or over capacity. Projected job and population growth, particularly in Maryland's Baltimore and Washington regions, will add demand on heavily used elements of its transportation system, creating more congestion in the future.



## **SHARED MOBILITY ECONOMY**

New mobility service providers that connect vehicles and riders like Zipcar, Uber, Lyft or city-wide bike share systems can provide cheaper and more immediate service, but the ultimate outcomes on vehicle ownership and transit ridership trends are hard to predict.



## **E-COMMERCE**

Continued expansion of goods and services purchased through the Internet at the expense of 'brick and mortar' locations may alter the number, type, and timing of vehicles on the road and length of trips they make. Fewer individual shopping trips may be offset by more delivery truck trips.





### ELECTRIC VEHICLES

Depending on the pace of advances in battery technology, refueling access, electric grid capacity, and oil prices in the future, electric vehicles promise lower transportation costs and a cleaner environment in Maryland; however, rapid adoption of electric vehicles will hurt gas tax revenue that pays for most infrastructure.



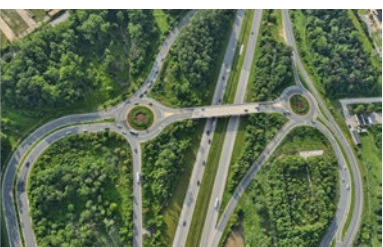
### CONNECTED AND AUTOMATED VEHICLES (CAV)

As Connected and Automated Vehicles (CAV) achieve significant fleet penetration, as is widely predicted over the next several decades, crashes caused by driver error may decline while computer-controlled vehicles operating safely at high speed could add capacity to existing highways. Infrastructure investments will be needed to fully realize the benefits of CAVs. On the other hand, the convenience of CAV travel may encourage more VMT, more dispersed work and living locations, and different transportation infrastructure needs.



### CLIMATE IMPACTS

Rising seas, more flooding, and hotter temperatures will stress infrastructure in the future differently than today. This will require changes in design specifications to maintain system resiliency.



### DEVELOPMENT PATTERNS

Decentralized growth, while a local choice in Maryland, often results in longer vehicle trips compared to dense development. It typically features few transportation options and it can pose extra costs to build and maintain State roads.

### MILLENNIAL GENERATION

Millennials show a preference for spending their wealth on experiences like entertainment, restaurants, or travel rather than material goods, which has the potential to redistribute non-work trips by time of day and destination; whether this will increase or decrease congestion remains to be seen.



### AGING POPULATION

Maryland's population is getting older. The increase in older and non-working transportation users could change travel patterns and travel times and affect public transportation agencies, non-profit transportation providers, and/or private providers.



### SUPPORT FOR DISTRESSED ECONOMIC REGIONS

Maryland's largest employment centers are in the Baltimore and Washington regions, but other parts of the State require transportation investments to ensure the continued growth of their economies. Striking a balance between congested and growing areas and slower growth areas in need of investment is an important policy challenge facing Maryland.

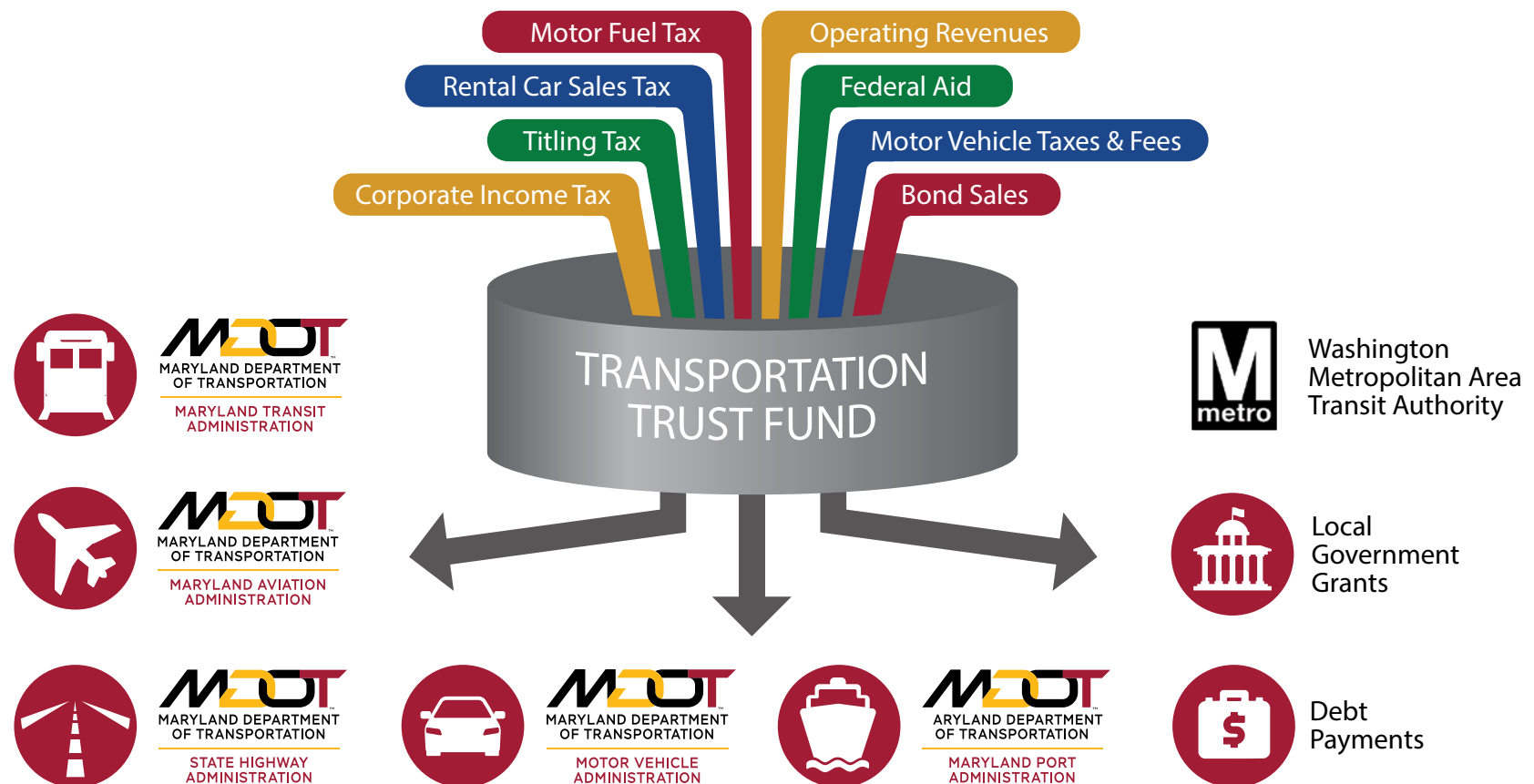


# Transportation System Needs and Revenue

Maryland's transportation needs are comprised of the costs required to operate and maintain the current transportation system, and to expand services and infrastructure as needed. These costs include operation and maintenance (O&M)

expenses, capital needs of each of MDOT's five TBUs and one Authority, and Maryland's share of the Washington Metropolitan Area Transit Authority's (WMATA) system. O&M expenses include the costs of service for 104 million annual transit trips, maintenance

of highways and bridges, dredging for the Port of Baltimore, and operations for the BWI and MTN airports. Capital needs include preservation and modernization of existing assets and strategic expansion.



MDOT's transportation system needs range from connecting customers to expanded transit options, to addressing roadway congestion, to optimizing waterways for trade. MDOT's highest priority continues to be to operate, maintain, and preserve its existing transportation infrastructure in a state of good repair; doing so improves safety. MDOT ensures all necessary debt service and contractual obligations, O&M, and system preservation needs are addressed first before expanding the system.

Developing needs estimates starts with evaluating and reporting on the performance of the transportation system, which MDOT does through the AR. Another key resource in the development of needs estimates are the various asset management plans developed by the TBUs which look to ensure its pavement and bridge, transit assets, and multimodal infrastructure meet the performance goals through asset management systems. Much focus is now also being placed on investments needed to address the emergence of new trends (e.g. ride-

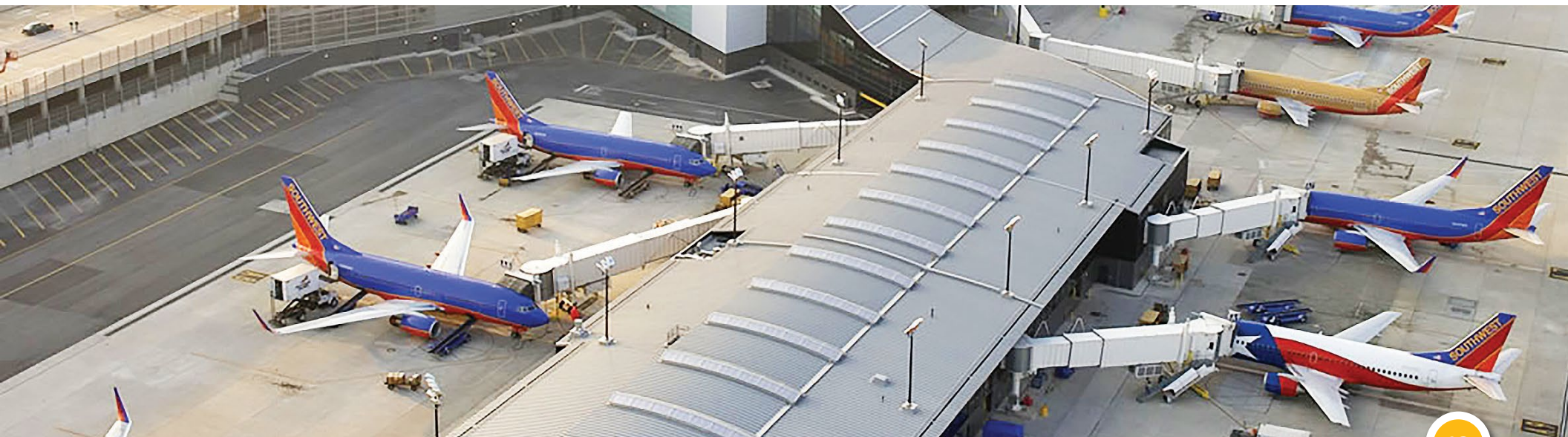
sharing) and technology (e.g. CAVs) that will likely impact the future of the State's transportation system.

Transportation needs in Maryland are primarily funded from an integrated account called the Transportation Trust Fund (TTF), the revenue sources of which are illustrated on the previous page. The Transportation Infrastructure Investment Act of 2013 (Transportation Act) substantially increased and advanced the TTF revenues. The changes included an increase in State motor fuel taxes, the indexing of principal revenue streams (e.g. motor fuel taxes and MDOT MTA passenger fares) to inflation, and restrictions on the transfer of funds from the Trust Fund to the State's General Fund.

Funds from the TTF are not necessarily earmarked for specific agencies or programs. This approach affords Maryland tremendous flexibility to meet the varying service and infrastructure needs to support its diverse transportation system. With the exception of MDTA, which is funded primarily through

tolls and concessions revenues, all activities of MDOT are supported by the TTF. This includes debt service, maintenance, operations, administration, and capital projects. Unexpended funds remaining in the TTF at the close of the fiscal year are carried over and do not revert to the State's General Fund. Disbursements for all MDOT programs and projects are made from the TTF.

Though the Transportation Act provided a boost to the TTF over the past 5 years, MDOT's transportation infrastructure needs to maintain and preserve the extensive system, strategically expand the system, and modernize the system are projected to exceed MDOT's ability to fund all needed improvements. This, coupled with the conservative assumptions about availability of future federal funds, highlights the importance of other project funding options including partnerships. Partnerships with other State and local agencies, and increasingly with private entities, are critical to ensuring the available funding to implement projects and meet the State's transportation needs.



# Goals, Objectives, and Performance Measures

MDOT conducted external surveys, including an interactive online survey for Maryland residents, to learn about and provide input on their transportation priorities in Maryland. MDOT also coordinated with staff internally to engage them in identifying key transportation priorities. All of these interactions, along with MDOT's mission statement and existing plans and programs have helped to shape the development of the 2040 MTP goals and objectives.

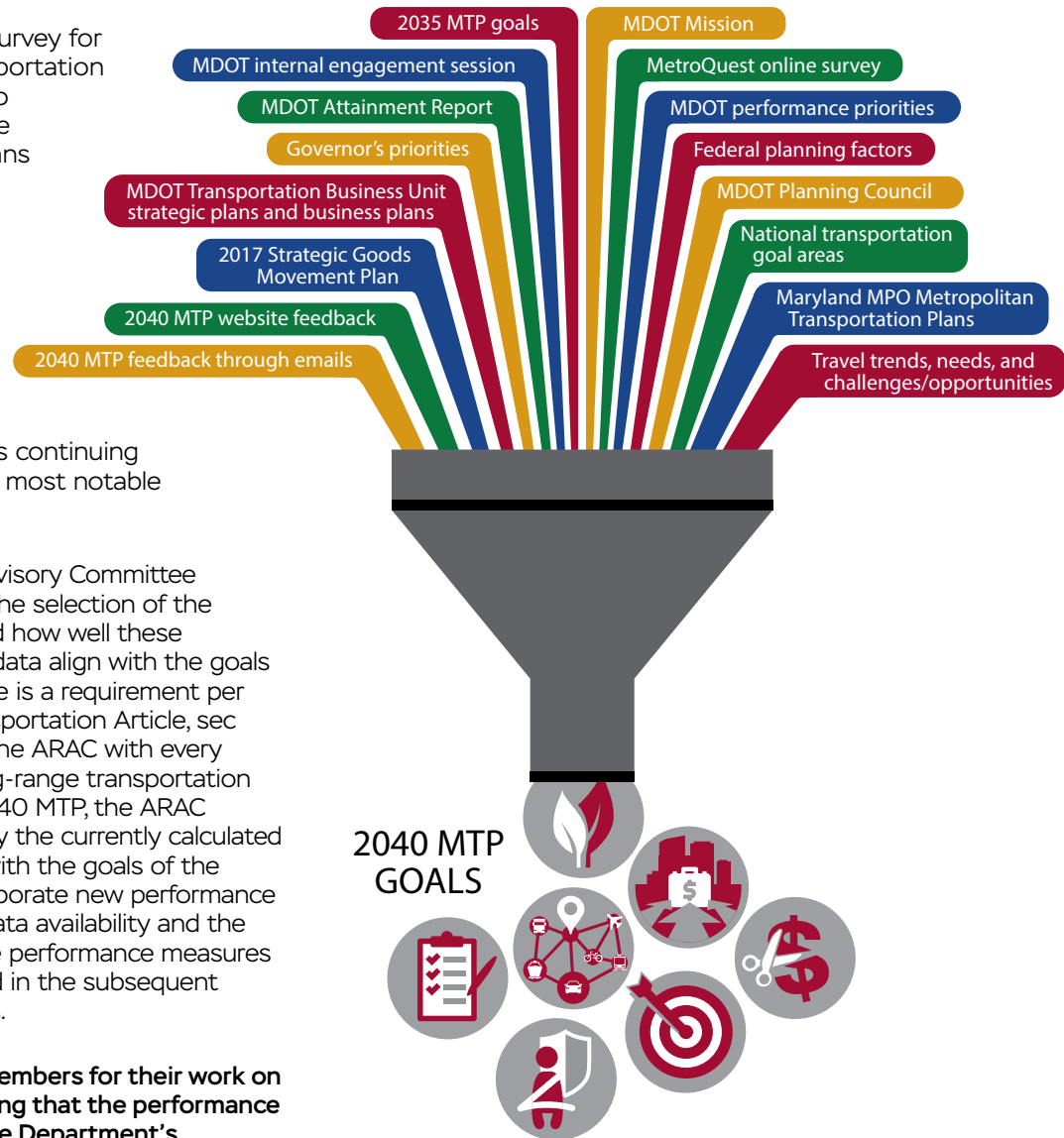
The goals are broad statements with desired results that reflect the overall MDOT mission statement. The objectives are more targeted outcomes within each goal area. Within the goals and objectives, associated performance measures are developed to evaluate how well MDOT annually achieves the 2040 MTP goals through the annual Attainment Report. This section outlines MDOT's seven 2040 MTP goals and the corresponding objectives for each. MDOT is continuing to make strides towards these goals—included here are some of the most notable accomplishments since the adoption of the 2035 MTP.

## FEDERAL PLANNING FACTORS:

- Support economic vitality;
- Increase the safety for all users;
- Increase the security for all users;
- Increase accessibility and mobility of people and freight;
- Protect and enhance the environment, and promote consistency with State and local plans;
- Enhance the integration and connectivity;
- Promote efficient management and operation;
- Emphasize preservation;
- Improve the resiliency; and
- Enhance travel and tourism.

The Attainment Report Advisory Committee (ARAC) advises MDOT on the selection of the performance measures and how well these measures and supporting data align with the goals of the MTP. This Committee is a requirement per Maryland code (Code Transportation Article, sec 2-103.1). MDOT convenes the ARAC with every new development of a long-range transportation plan. Concurrent to the 2040 MTP, the ARAC worked diligently to identify the currently calculated measures that best align with the goals of the 2040 MTP as well as incorporate new performance measures based on new data availability and the 2040 MTP priorities. These performance measures and targets will be included in the subsequent annual Attainment Reports.

**MDOT thanks the ARAC members for their work on this Committee and ensuring that the performance measures best speak to the Department's customers in showing MDOT's performance toward achieving these goals and objectives.**





# Ensure a Safe, Secure, and Resilient Transportation System

Enhance the safety and security of Maryland's multimodal transportation system and provide a transportation system that is resilient to natural or man-made hazards.

OBJECTIVES			
Reduce the number of lives lost and injuries sustained on Maryland's transportation system.	Provide for the secure movement of people, goods, and data.	Provide a resilient multimodal system by anticipating and planning for changing conditions, and hazards whether natural or man-made.	Improve roadway clearance times and facilitate efficient and coordinated responses to emergency and disaster events throughout the transportation system.
ANNUAL ATTAINMENT REPORT PERFORMANCE MEASURES			
Annual Number of Traffic Fatalities and Personal Injuries on All Roads in Maryland	MDOT-Wide Overall Perception of Safety: Crime and Safe Movement	Qualitative Discussion of Current Initiatives to Improve Resiliency and Address Climate Change, Including Resiliency Efforts and Vulnerability Assessments	Average Time to Restore Normal Operations After a Weather Event
Annual Number of Bicycle And Pedestrian Fatalities and Injuries on All Maryland Roads	Preventable Accidents Per 100,000 Vehicle Miles		
Number of Transit Passenger Fatalities and Injuries	Qualitative Discussion of Current Initiatives to Address Data Security		

## IN THE LAST 5 YEARS:

- MDOT MAA completed a \$350 million Runway Safety Area, Pavement Management and Standards Compliance Program in 2016 which brought all the runways at BWI Marshall Airport in compliance with FAA Runway Safety Area Standards.
- MDOT SHA promoted the Transportation Alternatives Program, Bikeways Program, Bicycle and Pedestrian Priority Areas, and Pedestrian Road Safety Audits delivering engineering, enforcement, and education support to local jurisdictions to improve multi-modal safety and mobility of all roadway users.
- MDOT MPA made improvements to truck drive lanes at the Port of Baltimore to improve safety and efficiency and increase inbound truck gate lanes.
- MDOT MVA introduced new driver's license designs that are more secure and less prone to identity theft, and piloted a digital driver's license, which offers a secure and convenient way to display identification documents.
- MDOT SHA completed a \$158.5 million safety and congestion relief project in 2017 to dualize MD 404 between US 50 and Denton.
- MDOT MTA was named America's safest transit system in terms of Part I crimes for four consecutive years (2014, 2015, 2016, and 2017) from among 12 of the largest transit agencies.



# Facilitate Economic Opportunity and Reduce Congestion in Maryland through Strategic System Expansion

Invest in and pursue opportunities to promote system improvements that support economic development, reduce congestion, and improve the movement of people and goods.

OBJECTIVES		
Pursue capital improvements to the transportation system that will improve access to jobs and tourism and leverage economic growth opportunities.	Improve the movement of goods within and through Maryland by investing in intermodal connections and improvements to reduce freight bottlenecks.	Strategically invest in expansion and operational improvements to reduce congestion along the multimodal transportation system.
ANNUAL ATTAINMENT REPORT PERFORMANCE MEASURES		
International Cruises Using the Port of Baltimore	Freight Originating and Terminating in Maryland	Annual Revenue Vehicle Miles of Service Provided (MDOT MTA)
BWI Total Annual Passengers	Port of Baltimore Foreign Cargo and MDOT MPA General Cargo Tonnage	Annual Cost of Congestion (\$ Billions) on the MDOT Highway Network
Jobs Supported by MDOT Capital Program  <i>Note: This measure will be reported in the AR until the replacement measure, Change In Market Access and Productivity Due to Improvements in the Transportation Network, is ready for reporting.</i>	Annual Hours of Delay for Trucks	
	Truck Reliability Index	

## IN THE LAST 5 YEARS:

- MDOT MTA built 5.5 miles of dedicated bus lanes, installed real-time information signs at 6 multi-modal transfer locations, and built the West Baltimore MARC transfer center.
- MDOT MPA purchased 70 acres of property at the Point Breeze Business Center for the long-term expansion of the Seagirt Marine Terminal to accommodate larger ships from the expansion of the Panama Canal representing MDOT MPA's first major land purchase for new cargo opportunities since 2001.
- MDOT SHA promoted Innovative Congestion Management (ICM) solutions, which broke ground on busy I-270 between Frederick and Washington, D.C., adding 23 new lane miles, more than 25 real-time traffic communication signs, and more than 30 intelligent signals.
- MDOT allocated \$765 million in funding in 2016 for construction of a new Potomac River crossing on US 301 from Charles County, Maryland, to King George County, Virginia which is vital to the nation's security and to the quality of life of thousands of Marylanders.



# Maintain a High Standard and Modernize Maryland's Multimodal Transportation System

Preserve, maintain, and modernize the State's existing transportation infrastructure and assets.

OBJECTIVES		
Preserve and maintain State-owned or funded roadways, bridges, public transit, rail, bicycle and pedestrian facilities, ports, airports, and other facilities in a state of good repair.	Strategically modernize infrastructure through new and innovative technology, enhanced partnerships, design standards, and practices to facilitate the movement of people and goods.	Use asset management to optimize public investment and ensure the sustainability of transportation infrastructure.
ANNUAL ATTAINMENT REPORT PERFORMANCE MEASURES		
Percentage of the MDOT SHA Network In Overall Preferred Maintenance Condition	Average Truck Turn Time at Seagirt Marine Terminal	Discussion of MDOT's Ongoing Asset Management Initiatives
Number of Bridges and Percent that Are in Poor Structural Condition	Percentage of State-Owned Roadway Directional Miles Within Urban Areas that Have Sidewalks	
Dredged Material Placement Capacity Remaining for Harbor and Poplar Island Sites	Percent of Sidewalks that Meet Americans with Disabilities Act (ADA) Compliance	
Overall Acceptable Pavement Condition		
Transit Rolling Stock Within Useful Life Benchmark		

## IN THE LAST 5 YEARS:

- MDOT addressed all 69 structurally deficient bridges identified in 2015.
- The I-95 Electronic Toll Lanes (ETL) were completed in December 2014, which included highway and safety improvements along the eight miles of I-95 from the I-895 interchange to just north of White Marsh Boulevard (MD 43) in northeast Baltimore.
- MDOT MTA launched real-time arrival information on all CityLink, LocalLink, and Express BusLink buses through the Transit app.
- MDOT SHA invested \$50.3 million to deploy Smart Traffic Signals on 14 major corridors across the State.
- MDOT MPA made improvements to the Cruise Maryland terminal, including changes to keep waiting passengers out of the extreme weather conditions and completely renovating the terminal's interior with new furniture, carpeting, check-in counters, signage, and entrances.



# Improve the Quality and Efficiency of the Transportation System to Enhance the Customer Experience

Increase the use of technologies and operational improvements to enhance transportation services and communication to satisfy our customers.

OBJECTIVES			
Increase the efficiency of transportation services through partnerships, advanced technologies, and operational enhancements to improve service delivery methods.	Enhance customer satisfaction with transportation services across all modes of transportation.	Minimize travel delays and improve predictability of travel times on Maryland's transportation system.	Apply enhanced technologies to improve communications with the transportation system users and to relay real-time travel information.
ANNUAL ATTAINMENT REPORT PERFORMANCE MEASURES			
MDOT MVA Alternative Service Delivery Transactions as Percent of Total Transactions	MDOT MVA Branch Office Customer Wait and Visit Time Versus Customer Satisfaction Rating	MDOT MTA Percent of Service Provided on Time	Customer Satisfaction With The Accuracy Of Real-Time Information Systems Provided
Percent of Toll Transactions Collected Electronically (i.e. E-ZPass®)	Overall Satisfaction with MDOT	Percent of VMT in Congested Conditions on Freeways/Expressways and Arterials in Maryland During the Evening Peak Hour	
Discussion on Current Use of Partnerships, Technologies, and Operational Enhancements to Improve Service Delivery Methods		Annual Hours (Thousands) of Delay on the MDOT Highway Network	
		Travel Time Reliability of the MDOT Highway Network	

## IN THE LAST 5 YEARS:

- Coordinated Highways Action Response Team (CHART) responded to 30,314 incidents, provided 42,048 motorist assists, averted 43.6 million hours of delays, and saved drivers \$1.5 billion in the cost of delays in 2017.
- MDOT MVA expanded Customer Call Center hours by an hour each weekday (from 4:30 p.m. to 5:30 p.m.) to better serve customers, which has resulted in a capacity increase of 21% and an additional 323,829 in calls answered by MDOT MVA since it was implemented.
- MDOT MVA implemented self-service Vehicle Emissions Inspection Program (VEIP) Kiosks in 10 MDOT MVA locations with over 88,000 transactions completed using the Kiosks to date.
- In 2018, MDTA announced it will be replacing existing toll-lane terminals and upgrading to third generation (3G) E-ZPass® System.
- MDOT MTA launched BaltimoreLink, a complete network redesign for the Baltimore region's transit system.
- MDOT launched the MDOT OneStopShop customer-focused website where Marylanders can address most of their transportation needs at one centralized web destination.
- MDOT MTA received a US DOT TIGER discretionary grant to advance the North Avenue Rising project improving safety and service along the North Avenue corridor for transit, pedestrian, and bicycle movement.



# Ensure Environmental Protection and Sensitivity

Deliver sustainable transportation infrastructure improvements that protect and reduce impacts to Maryland's natural, historic, and cultural resources.

OBJECTIVES		
Protect and enhance the natural, historic, and cultural environment through avoidance, minimization, and mitigation of adverse impacts related to transportation infrastructure, including support for broader efforts to improve the health of the Chesapeake Bay.	Employ resource protection and conservation practices in project development, construction, operations, and maintenance of transportation assets.	Implement initiatives to reduce fossil fuel consumption, mitigate greenhouse gases, and improve air quality.
ANNUAL ATTAINMENT REPORT PERFORMANCE MEASURES		
Acres of Wetlands or Wildlife Habitat Created, Restored or Improved	Recycled/Reused Materials from Maintenance Activities and Construction/Demolition Projects	Transportation-Related Emissions by Region
Water Quality Treatment to Protect and Restore the Chesapeake Bay	Utility Electricity Use & Renewable Energy Generation	Transportation-Related Greenhouse Gas Emissions
		Compliance Rate and Number of Vehicles Tested for VEIP Versus Customer Wait Time
		Total Electric Vehicles Registered In Maryland
		Total Publicly Available Electric Vehicle Charging Infrastructure

## IN THE LAST 5 YEARS:

- MDOT MPA was awarded several US Environmental Protection Agency (EPA) grants to aid in efforts to improve air quality in and around the Port including funding for truck owners to replace older trucks with newer, cleaner models; the upgrade of cargo-handling equipment through exhaust system upgrades or replacement; and installation of five automatic stop-start anti-idling devices on locomotives.
- MDOT, in collaboration with Maryland Department of Environment, other state agencies, and in partnership with a United Kingdom-based industry partner, hosted the inaugural GreenPorts Congress in North America in 2018.
- MDOT initiated the development of solar projects that promote social benefits, help achieve environmental goals, and promote economic benefits.
- MDOT MTA Introduced 27 electric vehicle charging stations across 13 locations, including Park & Ride Lots, MARC Stations, Light RailLink Stations, and Metro SubwayLink stations.
- MDOT MAA installed a 505 kilowatt Solar Plant at the airport that has generated over a million kilowatt hours of Solar Energy since installed.
- MDOT MPA improved water quality through installation of stormwater treatment technologies and contributing to the second trash wheel in the Baltimore Harbor.
- MDOT SHA completed the new Dover Bridge carrying MD 331 over the Choptank River, replacing a historic truss swing bridge built in 1932, preserving the historic bridge as a fishing pier, and preserving the environmental and natural wildlife in the pristine Choptank River basin.



# Promote Fiscal Responsibility

Ensure responsible investment and management of taxpayer resources to add value and deliver quality transportation improvements through performance-based decision-making and innovative funding mechanisms and partnerships.

OBJECTIVES		
Accelerate project completion through improved and efficient use of alternative project delivery methods and strategic partnerships.	Provide transportation services and solutions that maximize value.	Ensure a consistent revenue stream and ample financing opportunities.
ANNUAL ATTAINMENT REPORT PERFORMANCE MEASURES		
Percent of Projects Completed by Original Contract Date	Number of Nonstop Airline Markets Served	Qualitative Discussion of P3 Initiatives and Other Innovative Solutions Underway
	User Cost Savings for the Traveling Public Due to Incident Management	
	Operating Cost Per Revenue Vehicle Mile	
	MDOT MVA Cost Per Transaction	
	Airline Cost Per Enplaned Passenger (CPEP)	

## IN THE LAST 5 YEARS:

- The Port of Baltimore has been recognized as one of the nation's most efficient container terminals, and has a successful long-term Public-Private Partnership (P3) with Ports America Chesapeake.
- MDOT SHA has improved the construction bidding and project delivery process through Bid Express, E-Construction and A+B Bidding.
- MDOT has begun the process to participate in the largest P3 highway project in North America to add new lanes to I-270, the Capital Beltway, and the Baltimore-Washington Parkway.
- MDOT officials signed the \$5.6 billion P3 contract with the Purple Line Transit Partners to design, build, finance, operate, and maintain the light rail system. The Purple Line will run east-west inside the Capital Beltway with 21 stations.



# Provide Better Transportation Choices and Connections

Improve transportation connections to support alternative transportation options for the movement of people and goods.

OBJECTIVES		
Enhance, through statewide, regional and local coordination, transportation networks to improve mobility and accessibility.	Increase and enhance multimodal connections to improve movement of people and goods within and between activity centers.	Inform and educate customers on transportation options and benefits.
ANNUAL ATTAINMENT REPORT PERFORMANCE MEASURES		
Total VMT and VMT Per Capita	Access to Transit (Percent of Population Within Walk/Bike Distance of Fixed-Route Transit or Multimodal Center)	Mode Share
MDOT MTA Average Weekday Transit Riders (Thousands)		Estimated Annual Regional VMT Reduction Through TERMS
MDOT MTA Total Annual Transit Riders (Millions)	Bicycle Access to Transit	
Maryland-Only WMATA Annual Ridership (Thousands)	MDOT Survey - Perceptions of Multimodal Connectivity	
Number of Directional Miles Improved for Bicycle Access		
Percentage of State-Owned Roadway Centerlane Miles With a Bicycle Level of Comfort (BLOC) Grade 'D' or Better		
<i>Note: This measure will be replaced by a new measure based on traffic level of stress metrics</i>		

## IN THE LAST 5 YEARS:

- MDOT MPA received a US DOT TIGER discretionary grant for a project nearing completion, which widens the shipping channel to Seagirt Marine Terminal allowing access by larger ships transiting the enhanced Panama and Suez Canal, expanding rail capabilities to provide MDOT MPA's tenants at Fairfield Marine Terminal greater options for cargo handling, and increasing cargo storage capacity with 7 acres of new land adjacent to the Fairfield vessel moorings.
- MDOT MTA opened the Takoma Langley Crossroads Transit Center, the largest non-Metrorail station transfer point in the Washington Metro Region.
- MDOT MTA launched commuter bus service between the Eastern Shore and Baltimore as part of BaltimoreLink, and expanded commuter bus service to downtown Frederick MARC station creating service to Frederick for the first time.
- MDOT installed bikeshare stations at 8 rail stations and leveraged bicycle and pedestrian grants to fund a variety of improvements across the State.

The MDOT MVA Maryland Highway Safety Office (MHSO) and MDOT SHA have adopted the Toward Zero Deaths (TZD) approach. TZD is a data-driven effort to reduce fatalities and serious injuries by developing strong leadership in organizations that directly impact highway safety. Maryland leaders continue to build partnerships with government agencies, private citizens, traditional safety advocates, and nontraditional partners to strengthen state and local efforts to improve the safety of our transportation system for all users.

### Over the next 20 years...

- MDOT will update the Maryland Strategic Highway Safety Plan (SHSP) (2016-2020) to guide a focused approach on specific emphasis areas and incorporate systemic safety implementation to complement the location focused approach to improve safety.
- MDOT MHSO will support Maryland jurisdictions to develop a local SHSP, using the Maryland SHSP as a guide, and addressing local issues and strategies specific to each jurisdiction.
- MDOT SHA will develop the annual Highway Safety Improvement Program (HSIP) to implement the SHSP, implement projects and strategies to reduce identified safety problems, and report annual highway safety performance targets.
- MDOT will implement the strategies identified in this Plan and other Maryland safety plans to help Maryland achieve the safety goals and objectives of our community.
- MDOT will strategically modernize infrastructure through new and innovative technology, enhanced partnerships, design standards, and practices to improve the safety of the movement of people and goods.

# System Performance Report

In addition to its long-standing efforts measuring progress through the annual AR, Managing for Results, and the MDOT Excellerator, MDOT established performance targets for safety, infrastructure condition, system performance, congestion mitigation, and air quality as per 23 U.S.C. 490. MDOT has a certified initial Transportation Asset Management Plan (TAMP) process. In addition, MDOT MTA has developed a TAMP as a Tier I transit agency and also coordinated with the local transit operators to develop a Group Transit Asset Management Plan for all of the State's Tier II transit systems as per 49 U.S.C 5326. MDOT will continue to coordinate these efforts with its other planning and programming processes as documented in State and regional long-range transportation plans and transportation improvement programs.

## Highway Safety

MDOT updates highway safety performance targets for the following safety measures through the annual HSIP. Development of annual targets is coordinated by MDOT with MPOs, FHWA, and National Highway Traffic Safety Administration.

Maryland maintains the TZD approach by developing interim targets to track progress to an aspirational goal to reduce overall fatalities and serious injuries by at least 50 percent by 2030, starting with a baseline in 2008. The annual targets are set using an exponential trend line connecting the historical data to the 2030 goals, as listed below. Five-year rolling averages of historical data are used to calculate annual targets, along with annual vehicle miles of travel, which reached 60 billion in calendar year 2017.

### Toward Zero Deaths<sup>1</sup>

#### TOTAL FATALITIES

<b>623</b>	<b>296</b>
2008 Baseline	2030 Target

#### TOTAL SERIOUS INJURIES

<b>6,171</b>	<b>2,272</b>
2008 Baseline	2030 Target

#### TOTAL NON-MOTORIZED FATALITIES & SERIOUS INJURIES

<b>685</b>	<b>326</b>
2008 Baseline	2030 Target

#### TOTAL FATALITY RATE

<b>1.11</b>	<b>0.53</b>
2008 Baseline	2030 Target

#### TOTAL SERIOUS INJURIES RATE

<b>10.97</b>	<b>4.04</b>
2008 Baseline	2030 Target

#### ANNUAL VEHICLE MILES TRAVELED (VMT)

<b>60B</b>	<b>▲ 6.6%</b>
2017 CY	(2010-2017)

<sup>1</sup> 2008 Baseline figures based on five-year rolling averages from 2004-2008

# Transit Asset Management

MDOT MTA has worked closely with the Tier II transit agencies across the State to develop a Group Transit Asset Management Plan (AMP) for its Locally Operated Transit Systems (LOTS). Maryland's 20 Tier II agencies participated in the MDOT MTA group plan. In addition, MDOT MTA has developed their own TAMP as have the other Tier I transit agencies that provide service in Maryland including Montgomery County and Prince George's County, and WMATA – an agency that provides service to the Washington Metro Region including parts of Maryland.

Investment prioritization occurs on an annual basis for Maryland's transit agencies. This investment prioritization incorporates the findings of each of the agencies' AMPs to work toward the annual targets. The AMPs will be updated on a regular basis to capture the improvements in the overall asset management process towards an increased state of good repair. MDOT will continue to coordinate with all of Maryland's transit providers to continue to work toward these asset targets.



## REVENUE VEHICLES

- 763 Tier II
- 1,528 MDOT MTA
- 2,963 WMATA
- 365 Montgomery County
- 143 Prince George's County



## FACILITIES

- 42 Tier II
- 151 MDOT MTA
- 301 WMATA
- 11 Montgomery County
- 14 Prince George's County



## EQUIPMENT

- 687 Tier II equipment
- 748 MDOT MTA equipment
- 1,699 WMATA equipment
- 140 Montgomery County equipment
- 42 Prince George's County equipment



## TRACK MILES

- 563 MDOT MTA
- 234 WMATA

## Maryland Transit Agencies' Asset Management 2019 Targets

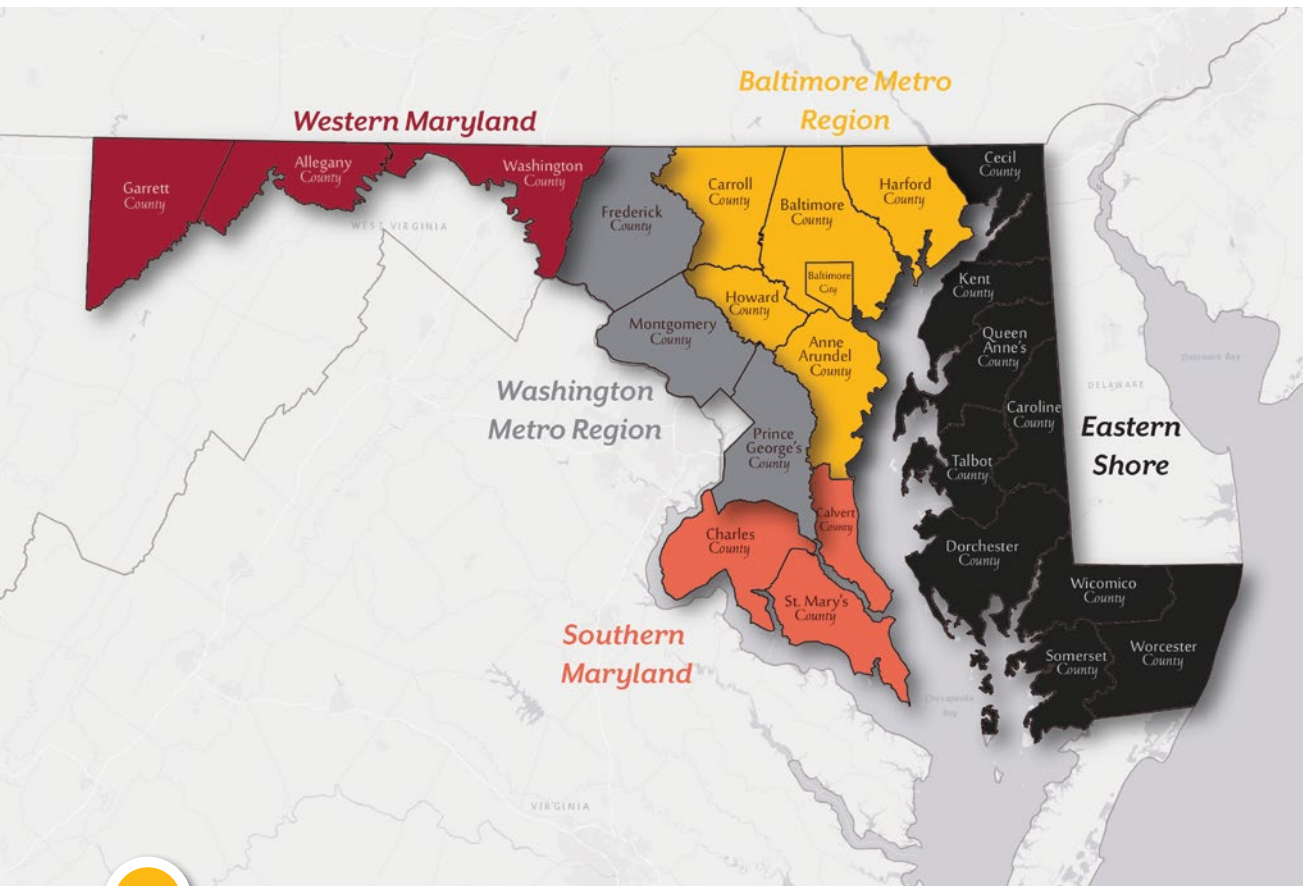
Asset Classification	Tier II Agencies	MDOT MTA	WMATA	Montgomery County	Prince George's County
Revenue Vehicles - % at or past useful life benchmark (ULB)					
Articulated bus	n/a	0.0	0	n/a	n/a
Over-the-road bus	n/a	0.0	n/a	n/a	n/a
Bus	13.3	0.0	0	11	0
Cutaway bus	10.8	0.0	n/a	n/a	50
Heavy rail passenger car	n/a	88.9	0	n/a	n/a
Light rail vehicle	n/a	0.0	n/a	n/a	n/a
Commuter rail locomotive	n/a	0.0	n/a	n/a	n/a
Commuter rail passenger coach	n/a	0.0	n/a	n/a	n/a
Van	35.4	0.0	20	n/a	0
Automobile	38.9	4.4	n/a	n/a	0
Equipment - % at or past useful life benchmark (ULB)					
Automobile	n/a	n/a	19	n/a	n/a
Trucks and other rubber tire vehicles	14.6	54.4	11	21	14
Steel wheel vehicles	n/a	61.1	24	n/a	n/a
Guideway - % under performance restriction					
Commuter rail	n/a	3.5	n/a	n/a	n/a
Heavy rail	n/a	3.5	2.1	n/a	n/a
Light rail	n/a	5.8	n/a	n/a	n/a
Facilities - % of Transit Economic Requirements Model (TERM) condition rating less than 3					
Passenger	25.0	17.0	7	0	n/a
Passenger parking	n/a	50.0	7	n/a	n/a
Maintenance	35.0	50.0	14	25	n/a
Administrative	5.0	21.0	14	25	n/a
Administrative/maintenance	25.8	n/a	n/a	0	n/a

n/a indicates that agency does not currently own a particular asset and therefore is not responsible for setting a target

# Implementation

MDOT has identified a set of strategies for implementing goals and objectives established in the 2040 MTP. Strategy development was informed by MDOT in strategic and business plans, as well as input from the public. Putting the strategies into action will help assure progress toward performance targets identified in MDOT's AR.

Though some of the 2040 MTP's implementation strategies are statewide, MDOT recognizes the State's regions are diverse and places high importance on customizing strategies to fit each region's unique needs and special context as described in the maps and illustrative projects in the pages that follow the strategies. **The illustrative projects represent a sample of the types of projects and programs that MDOT is considering implementing over the next 20 years; however, unless identified in the CTP, funding has not been committed for these projects. The CTP includes the projects for which MDOT has committed funding.**



## MDOT Illustrative Projects Over the Next 20 Years

- MDOT will replace the electronic toll collection and operating system to the 3rd generation (3G) toll system Authority-wide.
- MDOT will upgrade truck weigh facilities at the Kennedy Highway, Bay Bridge, and Hatem Bridge locations to accommodate increased truck traffic through new technologies, improving the efficiency and effectiveness of commercial vehicle safety programs.
- MDOT intends to install solar canopies in parking lots throughout the State, such as at MDOT MVA branch offices, Park and Ride lots, etc. The solar canopies enhance customer experience by providing shade and protection from adverse weather while providing renewable energy.
- MDOT SHA continues to deploy smart traffic signals on major regional corridors to improve congestion, safety, and traffic operations.
- Customer Connect will modernize the MDOT MVA's entire infrastructure and greatly enhance the agency's ability to provide fast, efficient, and premier customer service.
- MDOT MTA is deploying Positive Train Control (PTC) in coordination with Amtrak and CSX to increase safety across all MARC service.
- MDOT MTA will partner with jurisdictions and transit operators statewide to encourage innovation in transit service through the Statewide Transit Innovation Grant program.
- MDOT MPA will implement Innovative Reuse Demonstration Projects to show the potential for the reuse of all material dredged from the Baltimore Harbor by 2040.
- MDOT will continue to connect with partners to expand on opportunities in Automated Vehicle Testing in Maryland through the Maryland Locations to Enable Testing Sites (LETS).



# Ensure a Safe, Secure, and Resilient Transportation System

## STRATEGIES

OBJECTIVES				
Reduce the number of lives lost and injuries sustained on Maryland's transportation system.		Provide for the secure movement of people, goods, and data.	Provide a resilient multimodal system by anticipating and planning for changing conditions, and hazards whether natural or man-made.	Improve roadway clearance times and facilitate efficient and coordinated responses to emergency and disaster events throughout the transportation system.
STRATEGIES				
Develop and implement, through a data driven approach and best practices research, effective engineering and technology solutions to reduce aggressive and distracted driving and support impaired driving countermeasures.	Provide support for safe transit stops.	Invest in cyber-security through information technology (IT) improvements, improvements in Network Maryland, and in the Center for Internet Security Multistate Information Sharing and Analysis Center (MS-ISAC).	Identify and inventory assets that are vulnerable to flooding and inundation, and develop adaptation strategies such as reconstruction, relocation, and protective infrastructure to address existing and potential future weaknesses.	Implement unified incident command with first responders.
Implement public awareness training and media programs to educate drivers about child occupant protection, impaired driving, distracted driving, and aggressive driving.	Install new flashing light signals and replace outdated components at existing active warning-device installations at rail-highway grade crossings.	Design transportation system projects with security elements at the start.		Standardize operations, response, and scene safety practices with first responders and other key partners.
Implement safety improvements at intersections and along corridors where the Crash Severity index is high.	Collaborate with partners to maintain truck and rail safety enforcement and monitoring programs.	Develop and implement a comprehensive Safety Management System (SMS) for aviation.		Invest in technology to facilitate 24/7 roadway clearance and public information of incidents through the Coordinated Highway Action Response Team (CHART).
Implement system-wide roadway safety improvements and technology approaches that address the safety of vulnerable user groups (e.g. bicyclists, pedestrians, motorcyclists, older and younger drivers, etc.).	Improve the safety of bicycle and pedestrian travel through education, enforcement, and infrastructure solutions.	Continue to work closely with Anne Arundel, Howard, and Baltimore counties in implementing the Airport Zoning Permit process for proposed development within the vicinity of BWI Marshall and Martin State airports.		Develop and implement accredited incident management training with first responders.
Initiate appropriate infrastructure safety improvements with commercial motor vehicles in mind.	Continually improve first responder, emergency management, and rescue training programs and facilities.	Continue to upgrade security infrastructure such as closed-circuit television, security cameras, and other technology on the multi-modal transportation system.		
	Enhance facility inspection and maintenance program with technology-based management solutions.			



# Facilitate Economic Opportunity and Reduce Congestion in Maryland through Strategic System Expansion

## STRATEGIES

OBJECTIVES		
Pursue capital improvements to the transportation system that will improve access to jobs and tourism and leverage economic growth opportunities.	Improve the movement of goods within and through Maryland by investing in intermodal connections and improvements to reduce freight bottlenecks.	Strategically invest in expansion and operational improvements to reduce congestion along the multimodal transportation system.
STRATEGIES		
Develop a data supported system for performance reporting and project prioritization.	Address congestion and bottlenecks on nationally and regionally significant corridors to facilitate access to major employment, freight, and activity centers.	Identify locations where projected volume may exceed capacity on key freight rail corridors.
Target infrastructure and incentive programs towards improving job access and reducing household transportation costs.	Reduce or mitigate the effects of congestion on industry supply chains where appropriate.	Implement Transportation Systems Management and Operations (TSM&O) improvements to reduce congestion on highway systems, focusing on integrated freeway and arterial management and operations.
Use the economic model to assess productivity benefits through travel cost savings, reliability benefits of industry, delivery logistics and supply chain benefits, and agglomeration effects on access to specialized skills and services to facilitate business opportunities throughout Maryland.	Implement improvements at key freight bottlenecks identified in the State's Strategic Goods Movement Plan.	Develop a data supported system and modelling tools to evaluate benefits and tradeoffs for TSM&O strategies.
Ensure Maryland is well positioned to attract new industries that emphasize transportation alternatives in their site-selection process.	Acquire property adjacent to existing Port facilities to preserve opportunities for expanding terminal space	Evaluate managed lanes, including high occupancy vehicle (HOV) lanes, congestion pricing, and related strategies for future transportation investment and integrate transit as part of the strategies as appropriate.
Support state efforts to improve the attractiveness of Maryland for the traveling public, and to promote activity-based tourism.		Manage peak hour congestion on regionally significant corridors through targeted operational strategies.
		Expand air-cargo facilities at BWI Marshall Airport.



# Maintain a High Standard and Modernize Maryland's Multimodal Transportation System

## STRATEGIES

OBJECTIVES			
Preserve and maintain State-owned or funded roadways, bridges, public transit, rail, bicycle and pedestrian facilities, ports, airports, and other facilities in a state of good repair.	Strategically modernize infrastructure through new and innovative technology, enhanced partnerships, design standards, and practices to facilitate the movement of people and goods.		Use asset management to optimize public investment and ensure the sustainability of transportation infrastructure.
STRATEGIES			
Invest in MDOT roadways to maintain pavement quality.	Implement Connected and Automated Vehicle (CAV) pilots and support CAV testing through partnerships to build experience and attract partner investment in Maryland.	Provide real-time variable-control of speed, lane movement, and traveler information (for drivers and transit users) and conduct centralized data collection and analysis of the transportation system.	Invest in the National Highway System in accordance with the 10-year projections for bridges and pavement as identified in the Transportation Asset Management Plan.
Invest in MDOT bridges to improve structurally deficient bridges and preserve existing bridges to prevent them from becoming structurally deficient.	Implement robust telecommunications infrastructure, and enhanced road markings and signage to provide foundational needs of a CAV program.	Incentivize the demand for clean low-carbon fuels and the development of infrastructure to provide for increased availability/accessibility of alternative fuels and plug-in locations for electric vehicles.	Invest in Maryland's transit systems and rolling stock to maintain a state of good repair as per the Transit Asset Management Plan.
Study the effects of truck size and weight for permitted and non-permitted loads on safety, infrastructure, and the economy.	Implement an internal and external outreach program related to CAV and continue involvement in national CAV activities and through the MDOT CAV Working Group.		
Invest in MARC to overhaul and replace the rolling stock and introduce new diesel electric locomotives in order to extend the useful life of the MARC system.	Complete retrofits of existing facilities to achieve full ADA compliance of existing facilities and encourage the use of ADA best practices to the maximum extent reasonable within the constraints of a specific project or program.	Upgrade the existing fare collection system for BaltimoreLink, Metro Subway Link, and Light RailLink and introduce mobile ticketing service for MARC and Commuter Bus.	Develop a framework and guidance for asset management software and begin using a Business Intelligence tool to aggregate and manage asset data across MDOT.
Maintain the State's aviation facilities and runways in a state of good repair to support the vitality of aviation statewide.	Incorporate new American Association of State Highway and Transportation Officials (AASHTO) design standards and framework including an explicit purpose and need for projects, implementation of new context classification system, multimodal considerations, design flexibility, and performance-based design.	Promote electric vehicle infrastructure around the State.	Implement the short-term, mid-term, and long-term strategies identified in the State Asset Management Plan to improve the asset management and project selection across MDOT.
Maintain the navigation channel depth and width to allow safe, two-way traffic to and from the Port of Baltimore.		Assess opportunities for implementing truck platooning.	
Develop tools and guidance to ensure effective and efficient enhancement and maintenance of bicycle and pedestrian infrastructure.	Update state guidelines for bicycle and pedestrian infrastructure and establish a multimodal process to ensure innovative treatments and techniques are regularly vetted for inclusion.	Assess opportunities for implementing new and innovative public transit options through innovative financing and partnerships.	Assess MDOT properties for reuse potential and to optimize use of all parcel holdings.
Maintain, rehabilitate, and improve State-owned rail assets as identified in the MDOT Freight Lines Strategic Plan.		Continue to improve our transportation infrastructure using the most current design guidelines and applicable technology enhancements.	



# Improve the Quality and Efficiency of the Transportation System to Enhance the Customer Experience

OBJECTIVES		
Increase the efficiency of transportation services through partnerships, advanced technologies, and operational enhancements to improve service delivery methods.	Enhance customer satisfaction with transportation services across all modes of transportation.	Minimize travel delays and improve predictability of travel times on Maryland's transportation system.
STRATEGIES		
Implement One Stop Shop MDOT MVA Customer Service Centers and other improvements to customer service transactions as per the MDOT MVA Customer Service Plan.	Provide enhanced training and employee development for MDOT senior leadership, supervisors, and staff, especially employees interacting directly with our customers.	Expand CHART and other intelligent transportation systems and operations tools to better manage peak hour congestion on Interstate and regionally significant corridors.
Enhance and modernize MDOT IT systems.	Provide MDOT MVA Headquarters Senior Management customer support at branch offices twice per year.	Implement current state-of-the-practice in truck parking availability technology systems where appropriate and feasible.
Continue to perform Traffic Signal Synchronization and installation of "smart signals" to provide an efficient flow or prioritization of traffic, increasing the efficient operations of a corridor and reducing unwarranted idling at intersections.	Improve the tracking, responsiveness, and time-to-resolution of all electronic, telephone, written, and in-person correspondence.	Provide reliable and accessible real-time modal choice information to travelers and stakeholders at all times.
Expand and modernize the facilities at and around BWI Marshall Airport baggage handling system and the terminal curbside roadways.	Use social media to share information about services, events, and news to provide citizens and businesses with information important to them.	Develop education and outreach tools, including web-based and social media applications, targeted to the traveling public.
Develop new tools and use new technologies to facilitate multimodal planning, policy, and project-level decision-making at the state, regional, and local levels.	Enhance passenger wayfinding, convenience, and customer experience through improved amenity and technology based solutions at MDOT facilities including BWI Marshall Airport passenger screening and baggage handling and MDOT MVA branch offices.	
Coordinate with state and local government agencies to ensure that planned projects, new technologies, and incident training consider all customers to ensure equal access to Maryland's transportation system.		



## Ensure Environmental Protection and Sensitivity

## STRATEGIES

OBJECTIVES		
Protect and enhance the natural, historic and cultural environment through avoidance, minimization and mitigation of adverse impacts related to transportation infrastructure, including support for broader efforts to improve the health of the Chesapeake Bay.	Employ resource protection and conservation practices in project development, construction, operations, and maintenance of transportation assets.	Implement initiatives to reduce fossil fuel consumption, mitigate greenhouse gases, and improve air quality
STRATEGIES		
Prepare for future climate impacts on transportation infrastructure through: Site and Stressor Identification, risk assessment, and adaptation development.	Promote state dredging and dredged material placement priorities for inclusion in Federal appropriations and authorization bills.	Continue to increase the renewable energy portfolio through solar geothermal installations on MDOT facilities and rights-of-way.
Reduce water use and reuse water in order to reduce stress on fresh and drinkable water sources.	Increase public knowledge, understanding, and support of Maryland's Dredged Material Management Program through strategic outreach to the communities, businesses, and schools in the vicinity of project sites.	Continue to support investments and partnerships with intercity bus providers to promote use of intercity bus as a commute option to reduce congestion and improve air quality.
Improve waste minimization techniques through product life cycle analysis, reuse, and recycling.	Mitigate stormwater runoff to protect sensitive aquatic ecosystems, like the Chesapeake Bay with green infrastructure features such as bioswales and tree plantings.	Develop pricing strategies to encourage smarter commuting options.
Develop and implement a "Green Port Strategy" consistent with industry trends and initiatives including US EPA's Strategy for Sustainable seaports.	Continue to adhere to the Maryland Department of the Environment's standards and specifications for soil erosion and sediment and employ best management practices related to erosion control in the design and construction of projects.	Promote and/or incentivize fuel-efficient technologies for medium and heavy-duty trucks.
Continue to coordinate with other state agencies to heighten the awareness of the value and vulnerability of the State's water and natural resources.	Research and incorporate innovative practices to protect and conserve natural resources in the maintenance and operations of the transportation system.	Provide incentives to increase purchase of fuel-efficient vehicles/fleets.
Support state and local revitalization strategies to strengthen existing communities and infrastructure.	Develop a comprehensive Environmental Management System.	Encourage and incentivize retrofits and/or replacements of old, diesel powered non-highway engines, such as switchyard locomotives, with new hybrid locomotives.
		Install electric vehicle charging devices at parking lots along the Metro Subway Link, Light Rail Link, MARC, and Commuter Bus systems.



## Promote Fiscal Responsibility

## STRATEGIES

OBJECTIVES		
Accelerate project completion through improved and efficient use of alternative project delivery methods and strategic partnerships.	Provide transportation services and solutions that maximize value.	Ensure a consistent revenue stream and ample financing opportunities.
STRATEGIES		
Coordinate Transportation Systems Management and Operations (TSM&O) activities across MDOT, with regional and local agencies with clear, common objectives.	Implement practical design guidelines in the project development process.	Assess the potential of monetizing data as a new revenue stream.
Collaborate with public and private partners including CSX and Amtrak to determine the feasibility of creating a double-stack rail network into and out of the Port of Baltimore.	Include consideration of long-term maintenance, operations, and life cycle costs for any newly proposed facility.	Assess opportunities for implementing new and innovative mass transit options through private partnerships.
Increase truck parking facilities in key locations through innovative project delivery solutions and partnerships with private travel service providers.	Prioritize projects that enhance accessibility over mobility, and coordinate with local jurisdictions to ensure that land use decisions support such outcomes.	Leverage local funding contributions and incorporate bicycle and pedestrian improvements by private developers through transportation impact mitigation process where feasible.
Work in partnership with local jurisdictions and other state agencies to focus transportation corridor improvements to support development and revitalization in urban, town, and suburban centers.		

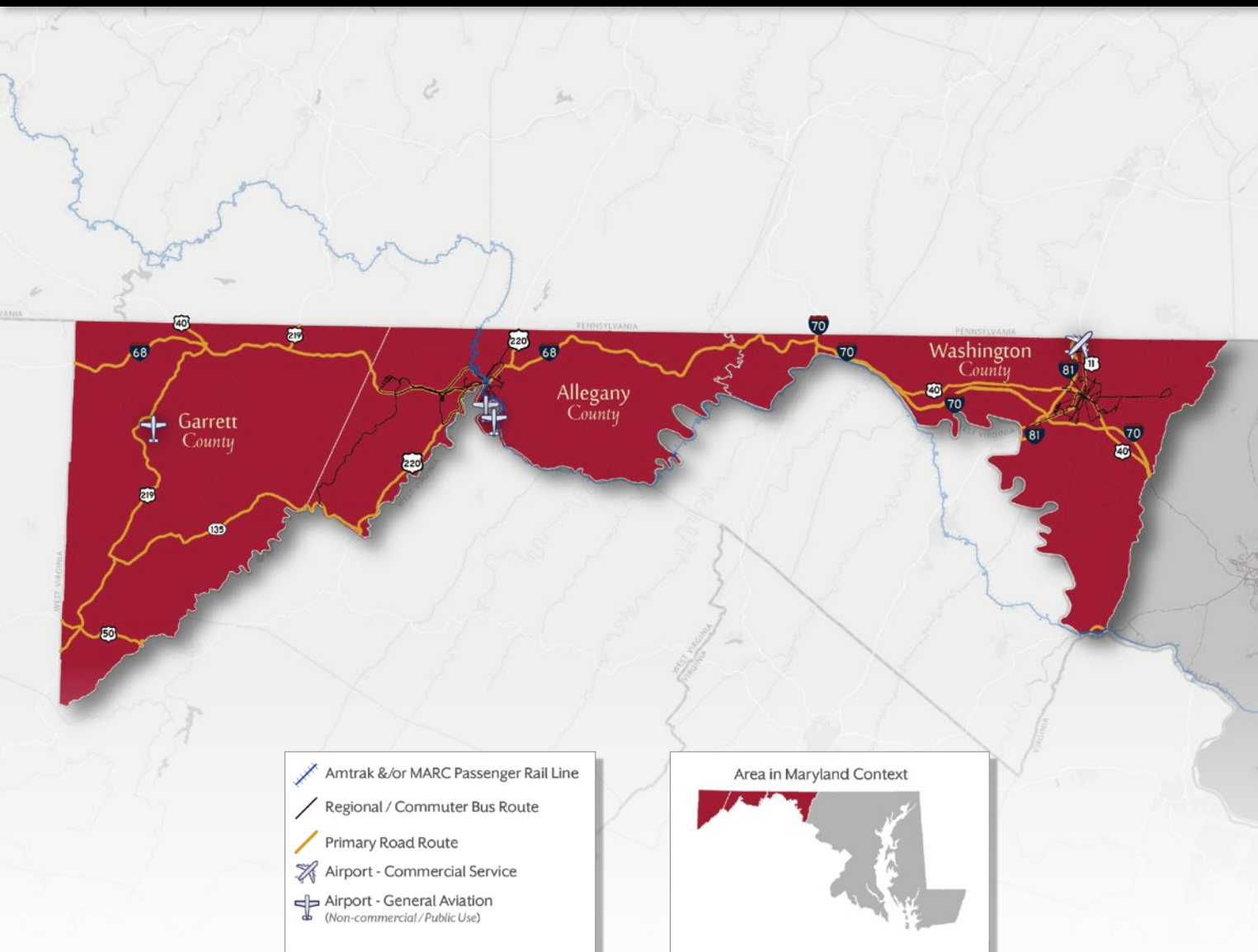


## Provide Better Transportation Choices and Connections

## STRATEGIES

OBJECTIVES		
Enhance, through statewide, regional and local coordination, transportation networks to improve mobility and accessibility.	Increase and enhance multimodal connections to improve movement of people and goods within and between activity centers.	Inform and educate customers on transportation options and benefits.
STRATEGIES		
Coordinate infrastructure improvements to facilitate multimodal connectivity and access.	Expand commuter transportation options, including commuter bus, car/vanpooling, park-and-ride facilities, cycling, walking, and transit, as well as promoting opportunities for teleworking, and alternative or flexible work hours to help reduce congestion along key routes.	Work with the University Systems to improve walk and bike access to and within their campuses.
Support public transportation improvements and improve access to service in accordance with Maryland public transportation plans.		Promote innovative public involvement strategies for projects such as use of social media and text message surveys to expand outreach and engagement.
Invest in improvements to transit to provide better access to BWI Marshall Airport.	Expand inland transportation capabilities at the Port of Baltimore.	Educate local leaders and elected officials on the benefits of other transportation options and opportunities for support through Commuter Choice Maryland.
Develop new tools to facilitate project development, prioritization, and implementation, and to ensure effective use of state and federal discretionary programs.	Improve landside and freight rail access to the Port of Baltimore, including implementation of an Intermodal Container Transfer Facility in the vicinity of the Port.	Provide outreach on Commuter Choice Maryland travel options through targeted media campaigns, brochures, and websites to promote bicycling, walking, carpooling, teleworking, and transit.
Coordinate activities across MDOT and with regional and local agencies to incentivize changing travel behavior.	Strategically invest to improve connectivity and comfort of pedestrian and bicycle networks within and between jurisdictions and for both on and off-road facilities to increase use and improve public health.	Strengthen employer commuter incentive programs by increasing marketing and financial/and or tax based incentives for employers, schools, and universities to encourage walking, biking, public transportation usage, carpooling, and teleworking.
Invest in improvements to provide choices and connections between rural and urban areas.		

## Western Maryland Transportation System



Western Maryland's transportation system is primarily automobile-oriented, but locally operated fixed-route bus service is provided in Cumberland and Hagerstown. Intercity bus providers connect parts of Western Maryland to the Baltimore metro area. The transportation system in the region also connects travelers to Pennsylvania and West Virginia.

### MDOT Illustrative Projects Over the Next 20 Years

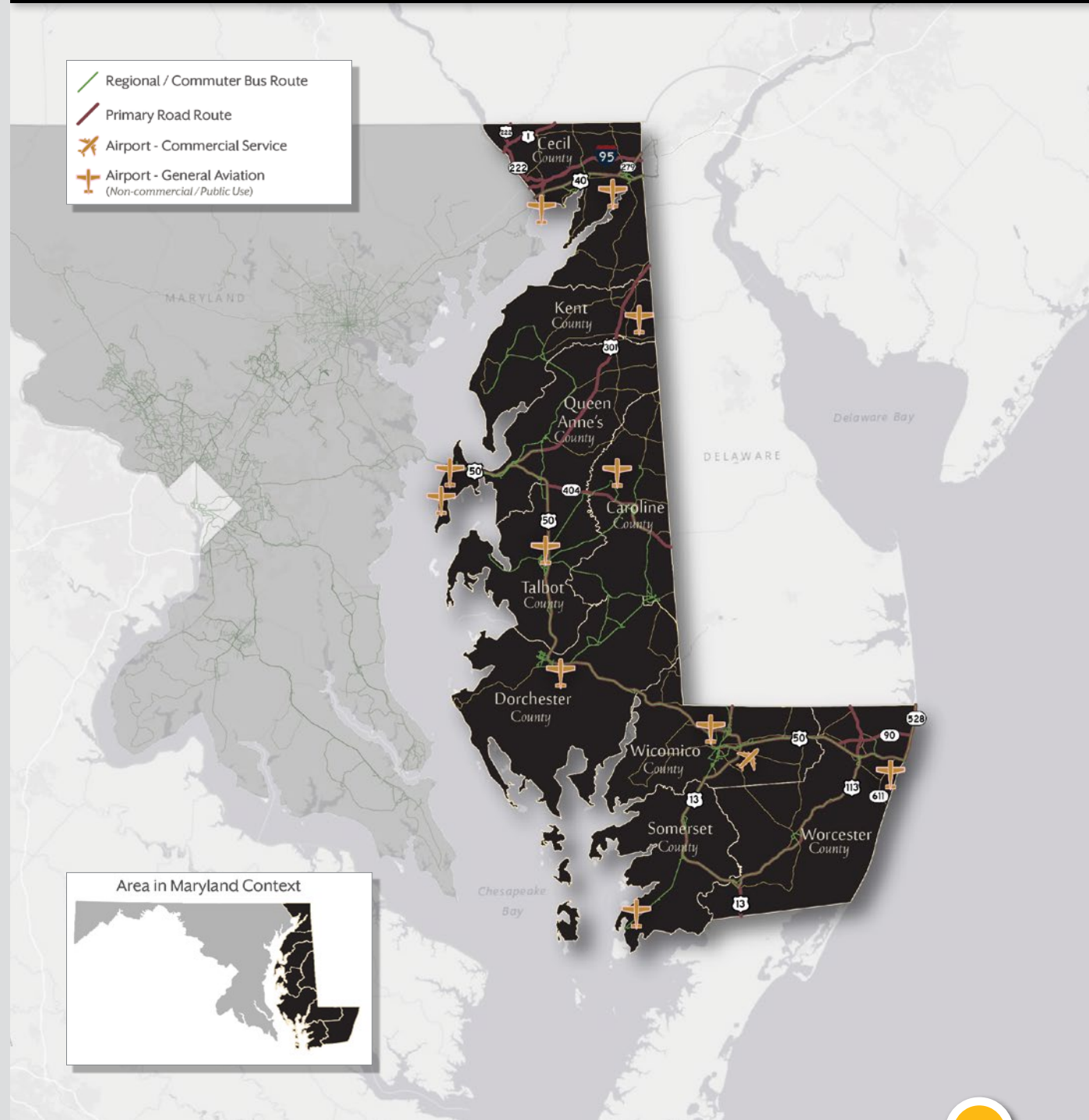
- MDOT SHA will complete I-81 corridor improvements from the West Virginia State Line to the Pennsylvania State Line, including upgrading and widening to reduce congestion, especially related to high truck volume, and provide capacity for planned development.
- MDOT will address truck parking shortages statewide, including at I-68 at the Youghiogheny Overlook.
- MDOT SHA will complete US 219 corridor improvements to enhance accessibility and promote economic development through upgrades and relocation of US 219 from I-68/US 40 to the Pennsylvania State Line.
- MDOT SHA will conduct a US 220 joint planning study with West Virginia.
- MDOT will improve the connection between the Cumberland Amtrak station and the Allegheny Highlands Trail.

The Eastern Shore's transportation system is automobile-oriented. Some communities in the region, such as Salisbury and Ocean City, have local fixed-route bus systems. Intercity bus providers connect the Eastern Shore to the Baltimore Metro Region. The transportation network in the region connects Maryland to Pennsylvania, Delaware, and Virginia.

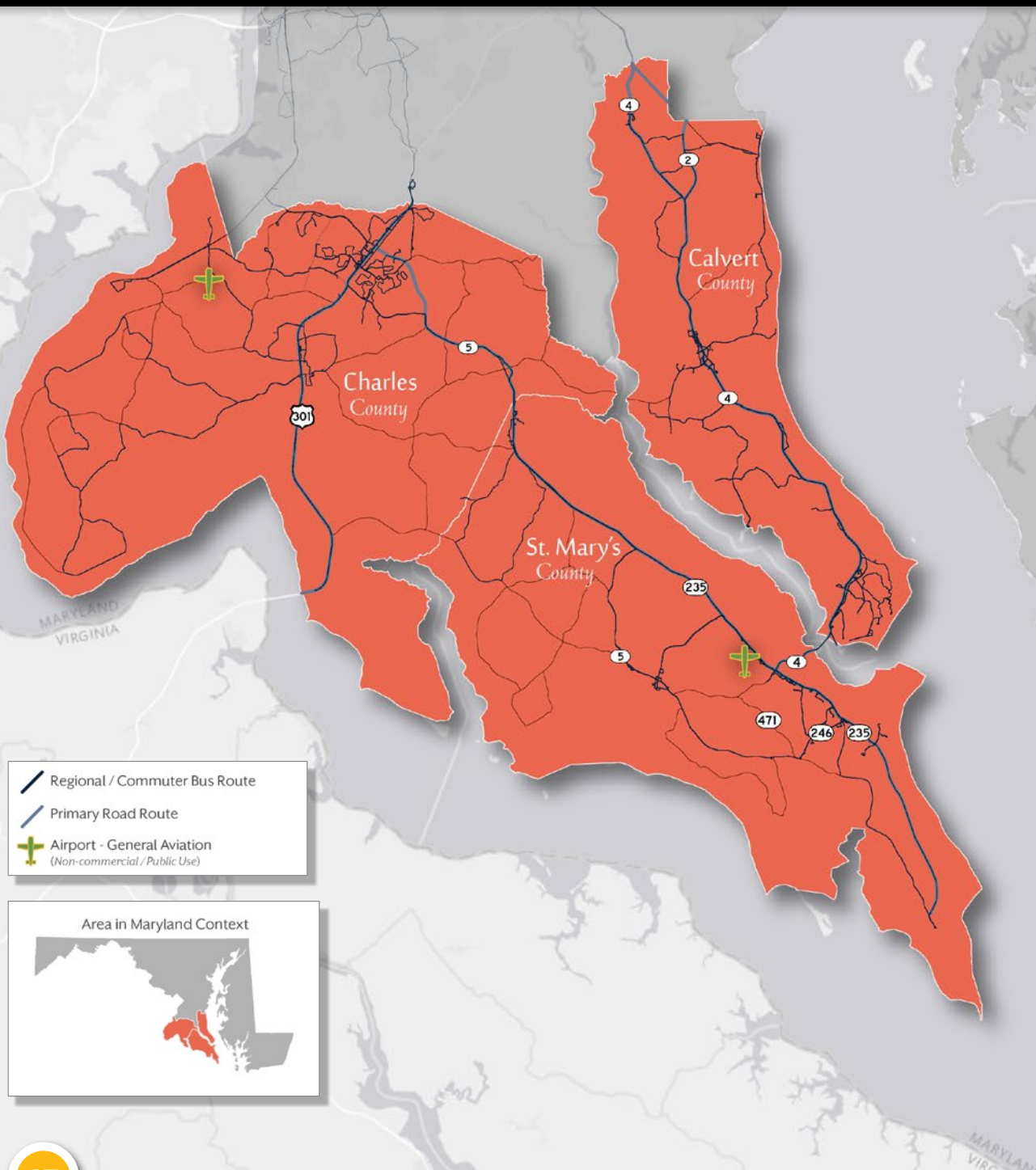
### MDOT Illustrative Projects Over the Next 20 Years

- MDTA will complete a National Environmental Policy Act Study for the I-95 Belvidere Road Interchange to determine the environmental effects of a new interchange providing access at I-95 and Belvidere Road.
- MDTA will complete a National Environmental Policy Act Study to determine the environmental effects of a new Bay Bridge crossing location.
- MDOT SHA will construct a shared-use path along US 50 from MD 611 to the US 50 Bridge over the Sinepuxent Bay.
- MDOT SHA will widen US 50 from US 301 to MD 404 and replace at-grade intersections with interchanges to increase capacity, relieve congestion and improve safety.
- MDOT MTA will support the construction of an Ocean City Transit Center which will include an administration building, bus wash, bus service, storage facilities, and parking to support transit service in Ocean City.

## Eastern Shore Transportation System



## Southern Maryland Transportation System



The Southern Maryland Region's transportation system is automobile-oriented. Each of the region's counties operates its own fixed-route bus system. Commuter bus routes also provide access from the region to the Washington, D.C. metro area. The transportation network in the region connects Maryland to Virginia across the Potomac River.

### MDOT Illustrative Projects Over the Next 20 Years

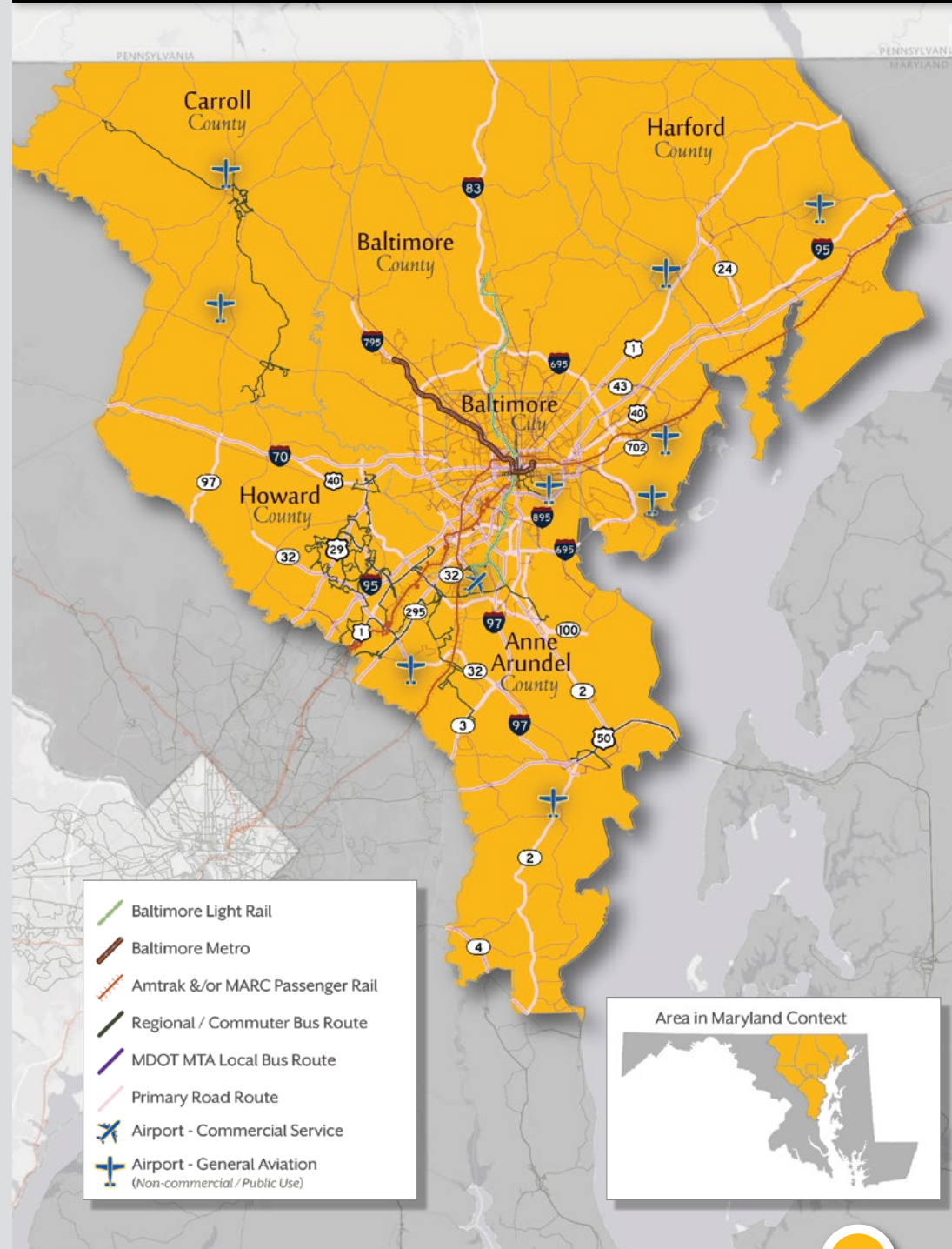
- MDTA will complete construction of the Nice Bridge, a new Potomac River crossing from Charles County, Maryland, to King George County, Virginia. This crossing is vital to the nation's security and to the quality of life of thousands of Marylanders who depend on this bridge daily for work, business, and recreation.
- MDOT SHA will continue to progress on updates to MD 4 from MD 2 to MD 235 including the replacement of the Thomas Johnson Bridge.
- MDOT SHA will widen MD 2/4 to six lanes from north of Stoakley Road/Hospital Road to south of MD 765A in Prince Frederick.
- MDOT SHA will upgrade MD 5 from MD 471 to MD 246 including the bridge over the Saint Mary's River.

The Baltimore Metro Region has many non-automobile transportation options including light rail, metro bus, commuter rail, and active transportation infrastructure. It is also home to the Port of Baltimore, BWI Thurgood Marshall Airport, and Martin State Airport. The transportation network in the region connects Maryland to Pennsylvania, Delaware, and the east coast.

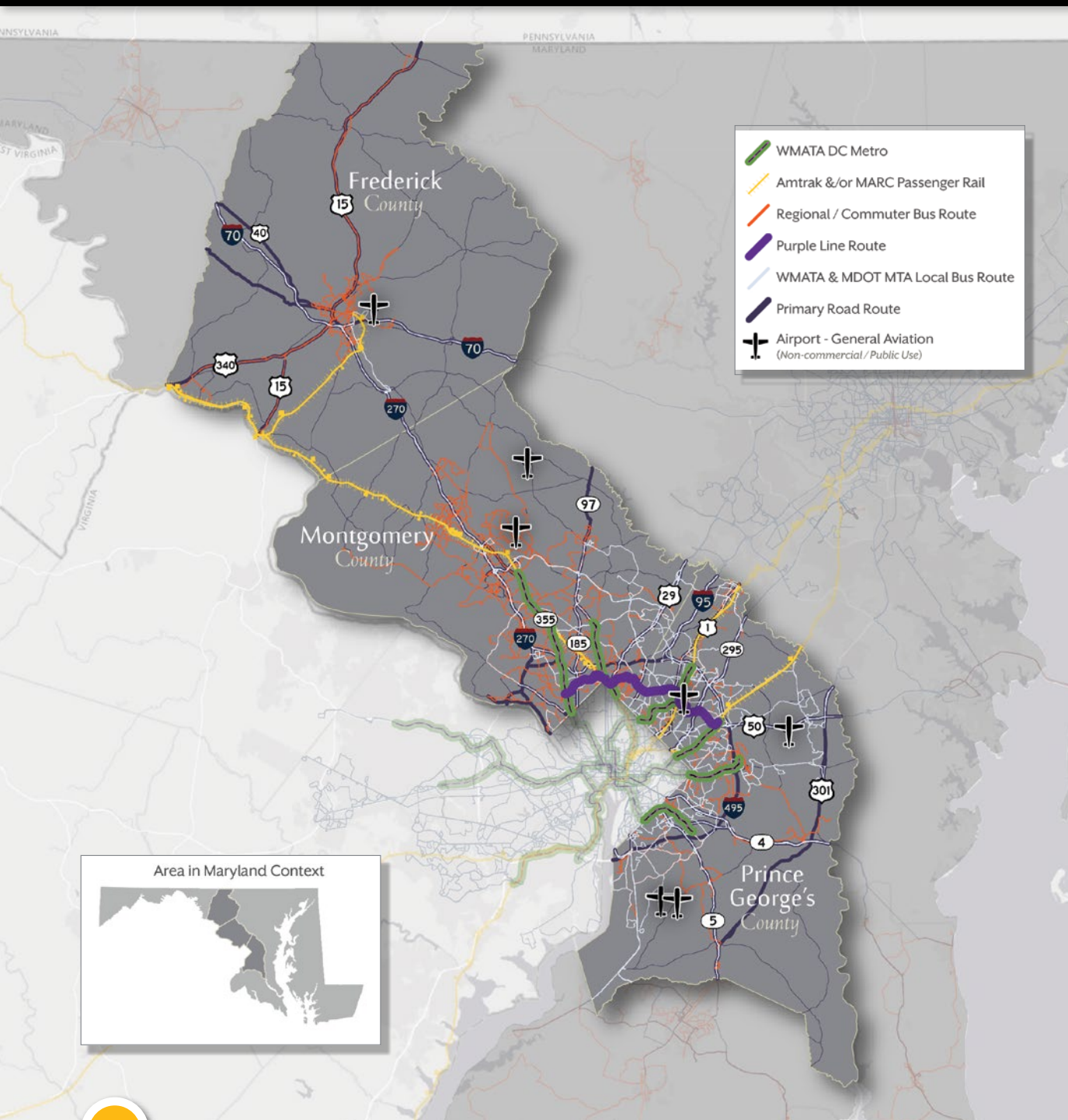
### MDOT Illustrative Projects Over the Next 20 Years

- MDOT MAA will replace the Air Traffic Control Towers at BWI Marshall and Martin State airports that are approaching the end of their usable lives to meet current and projected operational needs and standards.
  - MDOT MAA will complete the concourse connector program at BWI Marshall Airport that includes expanded passenger amenities, improved circulation, and enhanced baggage handling capability.
  - MDOT MTA will construct, in coordination with the Maryland Stadium Authority and the Orioles, a new Camden station to replace the temporary facility built in the 1990s and serve Camden Line MARC and Light Rail Link trains. The project will provide passenger amenities, MDOT police facilities, and signage.
  - MDOT MTA will upgrade its fleet including new Metro SubwayLink railcars, a mid-life overhaul to the Light RailLink vehicles, and replacement buses to improve reliability, safety, and customer comfort.
  - MDOT MTA will upgrade existing fare collection hardware and software to ensure security, and increase transit fare payment options and flexibility for customers.
  - MDOT will complete a National Environmental Policy Act Study for the I-95 Port Covington Access
- to determine the environmental effects of improvements to accommodate anticipated growth while maintaining the functionality of the regional and local transportation system.
- MDOT will complete a Baltimore Traffic Relief Plan that includes:
    - I-95 Express Toll Lanes - expanding the Express Toll Lanes from the existing terminus just north of MD 43 to north of MD 24.
    - I-695 Baltimore Beltway - make improvements to relieve congestion during peak hours within the segment from I-70 north to MD 43.
  - MDOT MTA will complete the North Avenue Rising project to install dedicated bus/bike lanes, transit signal priority, bus shelters, streetscaping, pedestrian lighting, and improvements to Penn North Metro SubwayLink to enhance transit, pedestrian and bicycle movement, and safety along the North Avenue corridor.
  - MDOT MPA will expand marine terminal capacity by redeveloping the Kurt Iron Slip at Fairfield Marine Terminal, redeveloping Point Breeze, reconstructing Berths 1-3 at Dundalk Marine Terminal, and deepening the Seagirt Loop Channel to support a second 50-foot berth to accommodate more Neo-Panamax ships at Seagirt Marine Terminal.

## Baltimore Metro Region Transportation System



# Washington Metro Region Transportation System



The Washington Metro Region has a radial highway system and an extensive and heavily used commuter rail, subway, and bus transit network. Portions of this region are well suited to active transportation modes. The transportation network in the region connects Maryland to Washington, D.C. and Virginia.

## MDOT Illustrative Projects Over the Next 20 Years

- MDOT MTA will complete the Purple Line transitway which will provide faster more reliable transportation between residential and major employment areas, enhance access to existing radial Metrorail lines, increase capacity of congested roadways, support economic development consistent with local master plans, and reduce environmental impacts.
- MDOT SHA will complete the I-270 innovative congestion management project, which will include implementation of innovative congestion management (ICM) tools to reduce congestion on I-270, including the east I-270 and west I-270 spurs.
- MDOT will complete the I-495 & I-270 Public-Private Partnership (P3) Project which includes managed lane improvements for over 70 miles of interstate in Maryland including:
  - I-495 (Capital Beltway) between the American Legion Bridge and the Woodrow Wilson bridge.
  - I-270 (Dwight D. Eisenhower Memorial Highway) between I-495 and I-70, including the east and west I-270 spurs.
- MDOT SHA will continue the pedestrian, safety, and operational upgrades to US 1 from College Avenue to I-495/I-95.
- MDOT will address truck parking shortages statewide, including at the I-70 eastbound and westbound welcome areas and at the I-70 eastbound truck rest area in Frederick County.

# Acknowledgements

The Maryland Department of Transportation would like to acknowledge the MDOT staff, planning partners, local, state, and regional government representatives, Federal Highway Division Office, Federal Transit Administration, and its customers who have helped to shape the 2040 Maryland Transportation Plan. The Maryland Department of Transportation would like to especially thank the members of the Attainment Report Advisory Committee (ARAC) who have worked closely with the Maryland Department of Transportation to update the annual Attainment Report and transportation performance measures. This effort will ensure that Maryland is advancing the right strategies to effectively implement the goals.

## 2019 ARAC Members

Required Representation	Representative	Representative Title	Organization
Maryland Business Community	Christine Ross	President/CEO	Maryland Chamber of Commerce
Disabled Citizens Community	Janice Jackson	Commissioner	Maryland Commission on Disabilities
Rural Interests	Geoff Turner	President/CEO	Choptank Transport
Auto Users Group	Ragina Cooper Averella	Public & Gov't Affairs Manager	American Automobile Association (AAA)
Transit Users Group	Steve Chan	Chairman	MARC Riders Advisory Council
Goods Movement Industry	Louis Campion	President/CEO	Maryland Motor Truck Association (MMTA)
	Geoff Turner	President/CEO	Choptank Transport
National Expert: Transportation Demand Management	Nicholas William Ramfos	Director, Transportation Operations Programs	Metropolitan Washington Council of Governments
National Expert: Pedestrian/Bike Transportation	Jennifer L. Toole, AICP, ASLA	President	Toole Design Group
National Expert: Transportation Performance Management	Matthew H. Hardy, Ph.D.	Program Director for Planning and Policy	American Association of State Highway and Transportation Officials (AASHTO)
Environmental Advocacy Organization	Joel Dunn	President/CEO	The Chesapeake Conservancy
Maryland Department of Planning	Pat Keller	Assistant Secretary for Planning Services	Maryland Department of Planning
Maryland Association of Counties	Keith Hall, AICP	Chief, Long Range and Transportation Planning	Salisbury/Wicomico Counties
	Alex Rawls	Long-Range Planner	Harford County Planning & Zoning
Maryland Municipal League	Jim Beauchamp	Town Council Vice President	Town of Centreville
	Tim Davis	Transportation Planner	City of Frederick



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