



2040 Maryland



BICYCLE AND PEDESTRIAN MASTER PLAN 2019 UPDATE

January 2019

MDOT
MARYLAND DEPARTMENT
OF TRANSPORTATION

Information contained in this document is for planning purposes and should not be used for final design of any project. All analysis, results, recommendations, cost opinions and commentary contained herein are based on limited data and information, and on existing conditions that are subject to change. Existing conditions have not been field verified, and further analysis is necessary prior to implementing the recommendations contained herein.



Message from Governor Larry Hogan

Our administration recognizes the importance of improving safe access for bicycles and pedestrians as a key component of our broader transportation strategy. As we strive to expand opportunity and improve the travel experience for all Marylanders, we are committed to improving the safety of Marylanders who bike and walk as part of their travel. To achieve this outcome, we are pleased to present the 2040 Bicycle and Pedestrian

Master Plan. This document, which is a companion document to the 2040 Maryland Transportation Plan, sets out important goals by which agencies across Maryland can partner to not only improve safety, but encourage more biking and walking activity. Supporting these outcomes will help improve transportation in our state, strengthen our economy, protect our environment, and improve health for our citizens.



Message from Transportation Secretary Pete K. Rahn

On behalf of the Maryland Department of Transportation (MDOT) and with profound appreciation to the many stakeholders and agencies who participated, I am proud to present the 2040 Bicycle and Pedestrian Master Plan. This document is a critical element and companion document to the 2040 Maryland Transportation Plan, which provides overall guidance to our strategic investment in transportation infrastructure. The Maryland Bicycle and Pedestrian Master Plan (Plan) update provides the opportunity to both reflect on our past efforts and evaluate the new and emerging needs and opportunities to enhance our bicycle and pedestrian networks.

As reflected in this Plan, Maryland has made great strides over the past five years, in expanding the directional miles of sidewalks along state roadways, addressing compliance with the Americans with Disabilities Act, and retrofitting roadways (both state and local) to enhance bicycle comfort and safety. We have also made substantial investments in our trail network and taken direct action to more seamlessly integrate bicycle and

pedestrian infrastructure into our transit network. None of this would have been possible, however, without the close collaboration of our many state, regional, and local partners who are so critical to the process of advancing bicycle and pedestrian activity in Maryland. A major focus of this Plan is to find ways to expand and enhance these partnerships and create tools to facilitate this great work.

Finally, I encourage all Maryland residents to use this Plan as an opportunity to redouble our efforts to promote safety for all users of our transportation network. Despite our best efforts to advance the "Toward Zero Deaths" campaign, Maryland has seen an unacceptable increase in deaths and serious injuries among bicyclists and pedestrians in recent years. We have responded by initiating a new Pedestrian and Bicycle Emphasis Area Team, as part of our Strategic Highway Safety Plan process, and we encourage our many local partners to consider similar initiatives at the local level. Let's build our collaboration to help advance the Plan's vision and make safety the first step to making Maryland a great place for biking and walking.

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CHAPTER 1

Introduction

Chapter 1 introduces the Update to the Maryland Bicycle and Pedestrian Master Plan (BPMP), the planning and engagement process, and an overview of the Plan's goals, objectives, and strategies.



Introduction

The state of Maryland has great opportunities for residents and visitors to walk and bicycle, both recreationally and as safe and convenient ways to get around. The 2019 Maryland Bicycle and Pedestrian Master Plan Update highlights the benefits of active transportation and offers solutions to Maryland's current challenges, providing opportunities to better meet the needs of all of our transportation system users. With input from a wide array of stakeholders, the Plan brings a fresh perspective and strategic focus to the challenge of guiding investments and policy, and realizing a newly-articulated **vision**:

Maryland will be a great place for biking and walking that safely connects people of all ages and abilities to life's opportunities.



Legislative Mandate

Maryland's Bicycle and Pedestrian Master Plan is legislatively mandated by the Transportation Article of the Maryland Annotated Code. As outlined in statute, the Plan is intended to identify goals and strategies for improving bicycle and pedestrian access in the state, and outline priorities and performance measures to guide future planning and investment.



Integrating Maryland's Multimodal Network

It is important to stakeholders that bicycle and pedestrian facilities be viewed as key components of the broader transportation priorities in Maryland. The strategic improvement of bicycle and pedestrian facilities must be fully integrated into the development of the state's multimodal network.



Maryland Transportation Plan

Updates to the BPMP are closely coordinated with the Maryland Transportation Plan (MTP), which presents a 20-year vision for addressing all transportation needs across the state. Biking and walking are integral parts of how the Maryland Department of Transportation (MDOT) approaches the core mission of connecting our customers to life's opportunities. MDOT, of course, is only one of many collaborators involved in realizing this vision.



Themes and Priorities

Throughout the planning process, research and outreach focused on common needs and themes of the MTP and BPMP. Accordingly, these priorities are echoed across these processes and reflected in performance measures identified by the Attainment Report Advisory Committee. Ongoing assessments are also conducted as part of MDOT's Excellerator Performance Management System and Managing for Results process.



Supporting Key Partners

Achieving Maryland's vision for safe biking and walking depends on effective decision-making at the local and regional levels. As illustrated throughout the outreach process, Maryland's communities are not well-served by "one-size-fits-all" solutions. The Plan targets specific needs and opportunities to build support for local and regional planning efforts. It also analyzes local capacity to facilitate and expedite strategically prioritized infrastructure projects.

Navigating this plan:

This plan is presented in four chapters:

Chapter 1 explains the process of updating the 2014 Plan; conducting outreach; and revising goals, objectives, and strategies.

Chapter 2 presents an overview of bicycling and walking trends related to demographics, infrastructure, and safety. It provides a brief profile for each region and discusses accomplishments and emerging themes identified during the planning process.

Chapter 3 provides more detail on the goals, objectives, and strategies, including illustrative examples of current projects that support the Plan's goals.

Chapter 4 describes key initiatives. These initiatives provide specific and targeted actions in making progress towards fulfilling the goals and sustaining the vision for a walkable and bikeable Maryland.

Plan Update Process

The update to the BPMP involved extensive research, analysis, and outreach to develop goals, objectives, strategies, and key initiatives. This process began with a stakeholder meeting with the Maryland Bicycle and Pedestrian Advisory Committee (MBPAC) in the Fall of 2017, and continued with a series of meetings, public outreach, and initiatives culminating in the release of the Plan in January of 2019.



Assessment

- MDOT Annual Attainment Report (AR) and AR Advisory Committee
- Demographic infrastructure inventories and trends
- Bike Safety Task Force: Recommendations on legislation, infrastructure, funding, and education (December 2017)



Analysis

- Best practices research—American Association of Retired Persons (AARP) and the American Association of State Highway and Transportation Officials (AASHTO) Council on Active Transportation
- Short Trip Opportunity Areas
 - Data development and GIS update
 - Pedestrian and Bicycle Statistical Team evaluation
 - BPMP Technical Advisory Group (TAG) review



Interagency Initiatives

- MTP: Research and guiding framework for the BPMP
- A Better Maryland: Over 72 listening sessions to support and improve economic growth, environmental stewardship, planning, and coordination
- Maryland Land Preservation and Recreation Plan (LPRP): Guides efforts to conserve open space and enhance outdoor recreation
- Maryland Department of Health: Walk plans and Walk Maryland initiatives
- Maryland Department of the Environment: Greenhouse Gas Emissions Reduction Act Plan

Public Engagement



Maryland Bicycle and Pedestrian Advisory Committee

- 2017: One-MDOT focus. Meeting to identify each agency's roles for bicycle and pedestrian issues
- October 2017: Roundtable discussion. Input on goals and breakout sessions on needs
- 2018: State partner agency roles. Input on BPMP and partnerships



Surveys

- BPMP Goal Update Survey (October 2017–March 2018)
- Statewide MTP survey of transportation priorities and strategies (November 2017–January 2018)
- MDOT Commuter Survey: Motivations and Barriers for Alternatives (Fall 2017)
- Bike Infrastructure GIS Inventory: Local government survey (Fall 2017)
- MDOT State Highway Administration (SHA) Spine Network survey and inputs (2016–2017)



BPMP Public Planning Workshops

March 28, 2018

Carroll County Office Building Westminster, Maryland

- Process and purpose overview
- Accomplishments and partnerships
- Needs, opportunities, and draft goals

June 7, 2018

Prince George's County Sports Complex Landover, Maryland

- Process Update and Emerging Themes
- Safety Data and Concerns
- Live Polling on Needs and Issues
- Draft Objectives and Strategies



Metropolitan Planning Organizations (MPO)

- Federally funded: MPOs guide transportation policy and investment in urban regions
- Maryland has seven MPOs: three of these have bicycle/pedestrian subcommittees (each consulting on the Plan)
 - Baltimore Regional Transportation Board (BRTB)
 - National Capital Region Transportation Planning Board (TPB)
 - Wilmington Area Planning Council (WILMAPCO), Non-Motorized Transportation Working Group



Partners and Stakeholders

- BPMP Technical Advisory Group
 - Local jurisdictions, regional planners, and stakeholders
 - Advised on progress, content, and initiatives
- MDOT Bicycle Pedestrian Workgroup (BPWG): Coordinating among MDOT agencies for BPMP and all bicycle/pedestrian efforts
- Strategic Highway Safety Plan (SHSP): Pedestrian and Bicycle Area Emphasis Team
- Smart Growth Subcabinet



Webinar and Ongoing Inputs

Live Interactive Webinar (April 19, 2018)

- Process overview and inputs
- Meeting reports and emerging themes
- Draft goals and objectives
- Online survey

BPMP Website (Launched October 2017)

- mdot.maryland.gov/BikePedPlanUpdate
- Surveys, meeting information, and regular updates

BPMP Email (October 2017–January 2019)

- BikePedPlanUpdate@mdot.state.md.us

Goals, Objectives, and Strategies

The Plan process identified the following goals, objectives, and strategies to guide state support for bicycle and pedestrian activity in Maryland.



1. Safety

Improve the Safety of Bicycle and Pedestrian Travel through Education, Enforcement, and Infrastructure Solutions

Objective 1.1

Reduce the number of bicycle and pedestrian lives lost and injuries sustained on Maryland's transportation system

Objective 1.2

Improve the maintenance and operations protocols that support safe access for pedestrians and bicyclists

Objective 1.3

Improve education, enforcement, and training to support safe driving, biking, and walking



2. Connected Networks

Enhance Transportation Choice and Multimodal Connectivity through Linked Networks

Objective 2.1

Leverage strategic investment in planned routes to support the creation, identification, and use of safe, lower-stress routes for biking and walking for all user groups

Objective 2.2

Improve bicycling and walking accessibility to transit facilities



3. Analysis and Planning

Support Efficient and Equitable Planning and Project Development with Data-driven Tools and Innovative Techniques

Objective 3.1

Improve access to data and decision tools to support effective and inclusive planning for all Maryland communities

Objective 3.2

Create tools to facilitate the development and delivery of more efficient, effective, and equitable projects



4. Partnerships

Build Partnerships to Promote Active Transportation and Strengthen the Health of our Communities

Objective 4.1

Leverage partnerships to encourage more Maryland residents of all ages, abilities, and income levels to participate in active transportation to meet more of their transportation needs

Objective 4.2

Strengthen partnerships so Maryland communities are better equipped to implement active transportation solutions to achieve health and other benefits



5. Economic Development

Advance Biking and Walking as an Economic Development Strategy

Objective 5.1

Develop biking and pedestrian facilities and programs to promote active tourism

Objective 5.2

Expand access to economic benefits of bicycling and walking to more Maryland residents and businesses

Strategy 1.1

- **1.1a** Continue to improve data collection techniques and access to safety data to support efforts to plan for and implement safer networks
- **1.1b** Refine techniques for understanding and evaluating safety issues and areas of concern
- **1.1c** Implement effective design solutions and countermeasures to enhance safety of infrastructure

Strategy 1.2

- **1.2a** Improve methods for identifying maintenance and safety concerns and for communicating them to appropriate agencies
- **1.2b** Enhance protocols that ensure safe access for pedestrians and cyclists during the construction phase of infrastructure projects

Strategy 1.3

- **1.3a** Regularly update and effectively communicate information on new safety laws and technologies
- **1.3b** Improve training and education for all roadway users and design professionals in emphasizing bicycle and pedestrian safety

Strategy 2.1

- **2.1a** Strategically invest to address and prioritize eliminating gaps and barriers in strengthening the bicycle and pedestrian network
- **2.1b** Develop tools and provide guidance to identify missing links for and remove barriers to bicycle and pedestrian travel as part of implementation of the Complete Streets initiative
- **2.1c** Use best practices to characterize facility use and context to help ensure appropriate treatments are integrated into project development and maintenance processes

Strategy 2.2

- **2.2a** Target specific bus stop and transit station area improvements to enhance pedestrian and bicycle infrastructure access
- **2.2b** Expand and improve facilities to accommodate bicycles on transit vehicles, including locally operated transit services, buses, Metro, Light Rail, and commuter rail (MARC)
- **2.2c** Evaluate potential for secure bicycle parking at select MARC, Metro SubwayLink, and Light RailLink stations

Strategy 3.1

- **3.1a** Provide assistance to support strategic planning and implementation of context-appropriate bicycle and pedestrian infrastructure
- **3.1b** Improve access to data and best practice examples to evaluate alternatives, conduct outreach, and adopt effective policies and plans

Strategy 3.2

- **3.2a** Update guidance and policy documents on a regular basis to reflect agency best practices
- **3.2b** Provide technical assistance to support the identification, prioritization, and implementation of projects and to cultivate relationships that can overcome physical and institutional barriers in the network
- **3.2c** Compile and disseminate funding and project information to improve transparency and performance

Strategy 4.1

- **4.1a** Strengthen outreach and incentives promoting active commuting options
- **4.1b** Develop new initiatives to support walking and biking for non-work trips
- **4.1c** Provide support for planning and design decisions to promote the attractiveness and ease of biking and walking for Maryland residents
- **4.1d** Expand partnerships and improve participation in active transportation events and planning meetings

Strategy 4.2

- **4.2a** Develop data and metrics to help quantify the health benefits of active transportation
- **4.2b** Support integration of health into local community development and revitalization strategies
- **4.2c** Develop guidance and demonstration projects to support the expansion and maintenance of sidewalks and shared-use paths

Strategy 5.1

- **5.1a** Support expansion of biking and walking infrastructure to support tourism and attract new visitors
- **5.1b** Improve wayfinding and mapping to better connect users with amenities and businesses
- **5.1c** Integrate active transportation options into tourism development strategies

Strategy 5.2

- **5.2a** Conduct analysis to help quantify economic impacts of biking and walking
- **5.2b** Provide technical assistance, design guidance, and investment to improve access to commercial hubs and neighborhoods
- **5.2c** Continue to support transit-oriented development and related opportunities that leverage multimodal access and attract businesses that prioritize bicycling and walking access

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CHAPTER 2

Existing Conditions

This chapter summarizes existing conditions, demographic and safety trends, infrastructure investments, and accomplishments since the release of the 2014 Maryland Bicycle and Pedestrian Master Plan. It contains a brief profile highlighting some of the unique resources within each of Maryland's five regions, and describes key themes that emerged in shaping the Plan's progress.



Existing Conditions and Trends

Maryland's transportation needs and planning efforts are influenced by trends in population growth, demographic characteristics, employment, and land use. Some of the key trends are described below. They reflect a greater need for bicycle and pedestrian use to help relieve congestion, increase options for commuting and non-work transportation, and improve public health.

Travel Trends

Currently, more than 74% of Maryland residents drive alone to work. The 2040 Maryland Transportation Plan shows that Vehicle Miles Traveled (VMT) in Maryland continues to increase. Maryland is estimated to have one of the longest average commute times in the country, and it is projected that future demand will far outpace the capacity of existing infrastructure.

U.S. Census estimates show that at least 9% of Maryland households do not have access to a motor vehicle and must rely on other transportation modes to meet their daily needs. The Census does not include data for non-work trips, multiple modes trips, or biking or walking on a non-daily basis.

However, recent MDOT statistics do show that there is a slight decline in transit ridership in Maryland. This indicates that there is an opportunity to better leverage state and local transportation investments by continuing to improve first mile/last mile connections to bus stops and train stations.

VMT and congestion can significantly reduce the lifespan of transportation infrastructure, decrease productivity and economic vitality, degrade the environment, and increase health-related issues for residents. A 2017 survey of Maryland residents demonstrated that health, the environment, saving money, and reducing stress were the major motivating factors for biking and walking to work.

While MDOT continues to invest in infrastructure to improve the efficiency and expansion of the State's roadway network, some of these projects create new barriers that disrupt critical links for bicyclists and pedestrians. By law, the SHA and the Maryland Transit Administration (MTA) are required to examine the impacts of newer infrastructure for all users, yet challenges remain. Maryland's bridges, in particular, are a major limiting factor in completing critical links and improving the safety of bicyclists and pedestrians in Maryland.

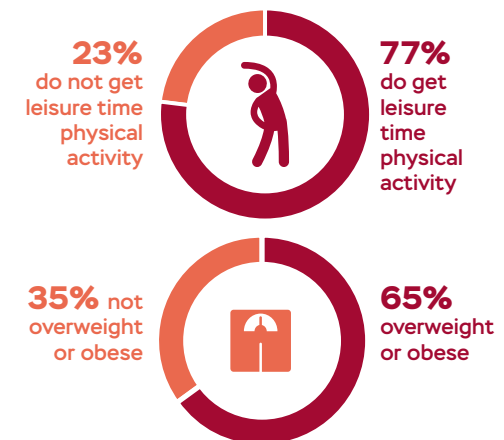
Population Trends

Maryland's population is growing. With recent population and employment growth rates at 4.4 and 6.2% respectively, the demand for transportation choices, such as walking and bicycling, will likely increase. Maryland's population is also aging - the population over 65 years old increased by 24% between 2010 and 2016. Investing in safe and accessible infrastructure to support active transportation for people of all ages and abilities is a growing priority in many Maryland communities.

Health Statistics

Although walking is the official exercise of Maryland, rates of obesity across the state suggest that many of our residents are not participating in activities associated with active lifestyles. Although recent health surveys suggest that 77% of Marylanders are engaging in some form of physical activity, almost 65% of the population is overweight or obese.

Data source: 2016 Maryland Behavioral Risk Factor Surveillance System (BRFSS), 2016 National BRFSS



Trends*

4.4% Population growth 2010-2016	2.7% Commute by bike or by walking
24% Population growth of people over age 65 2010-2016	9% Households with no access to a vehicle
6.2% Job growth 2010-2015	8.6% Decrease in transit ridership 2010-2016
74.6% Marylanders who drive alone to work	32.3 Average commute duration minutes
	Health #1 motivation among residents who walk to work

*Sources: U.S. Census Bureau, American Community Survey 2017; 2018 MDOT Commuter Choice Maryland Survey

State Road Network Bicycle and Pedestrian Infrastructure

MDOT reports annually on the extent of bicycle and pedestrian accommodation on the state road network. Key metrics are established as part of the MTP and the Attainment Report.

Since 2017 Maryland has maintained 17,143 land miles of highway and, beginning in 2004, used the measure of "Bicycle Level of Comfort"



2017 Pedestrian Accommodation

- 700** miles of sidewalk along state roadways
- 20%** of state roadway miles in urban areas have sidewalks
- 67%** of sidewalks along state roadways are Americans with Disabilities Act (ADA) compliant



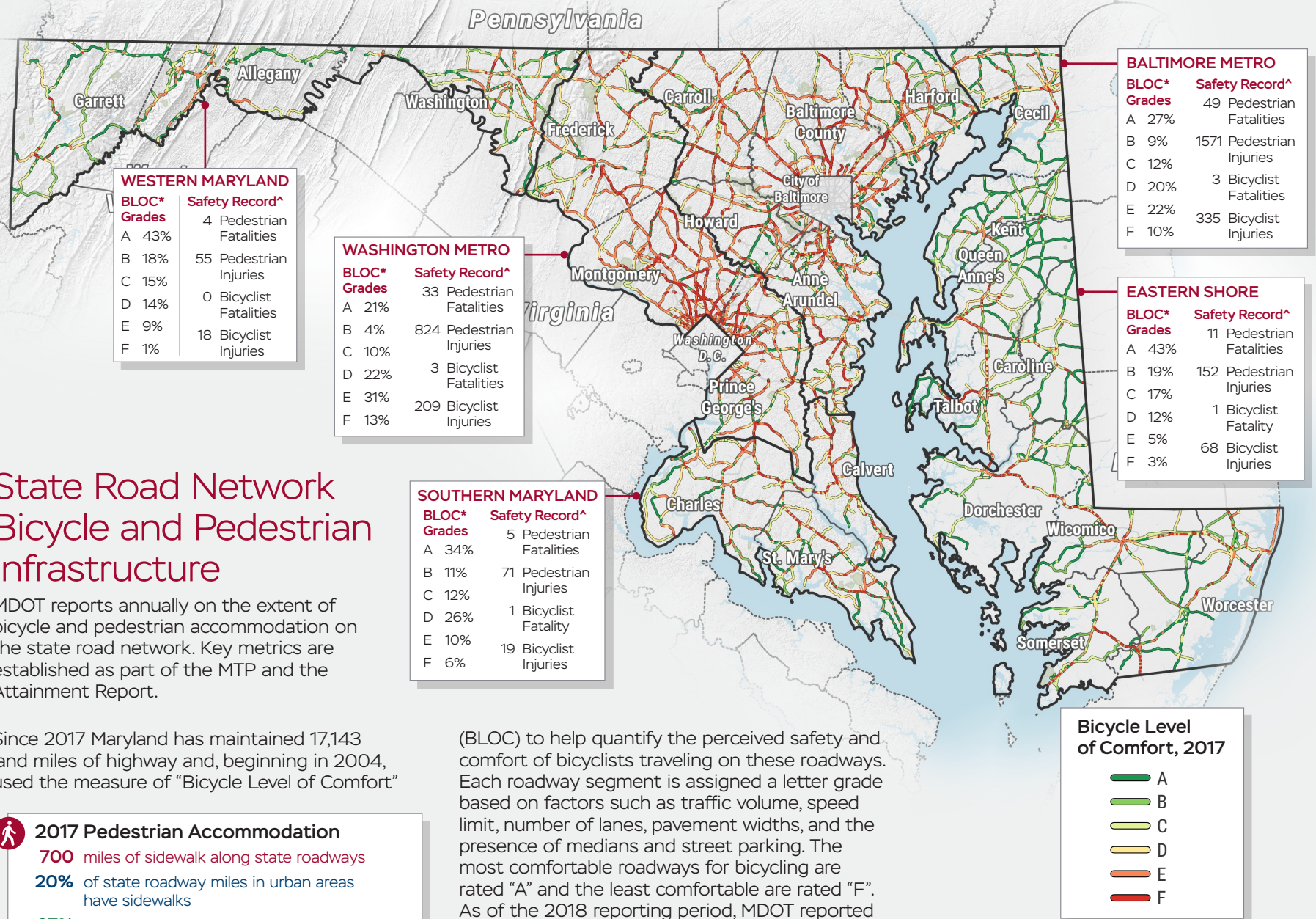
2017 Bicycle Accommodation

- 60%** of state roadway miles rated D or better
- 274** miles of roadways "improved for bicycle access"

(BLOC) to help quantify the perceived safety and comfort of bicyclists traveling on these roadways. Each roadway segment is assigned a letter grade based on factors such as traffic volume, speed limit, number of lanes, pavement widths, and the presence of medians and street parking. The most comfortable roadways for bicycling are rated "A" and the least comfortable are rated "F". As of the 2018 reporting period, MDOT reported meeting the interim target of roughly 60% of state roadways having a BLOC score of D or better. Although BLOC has several limitations as a performance measure (as addressed in this plan), it currently presents the best available data in demonstrating existing conditions.

*BLOC Map and sidewalk statistics source: Maryland State Highway Administration. Numbers may not add up to 100% due to rounding.

^2012-2016 Bicycle/Pedestrian Crash Data, five-year averages. Source: State Highway Administration and Washington College GIS Program



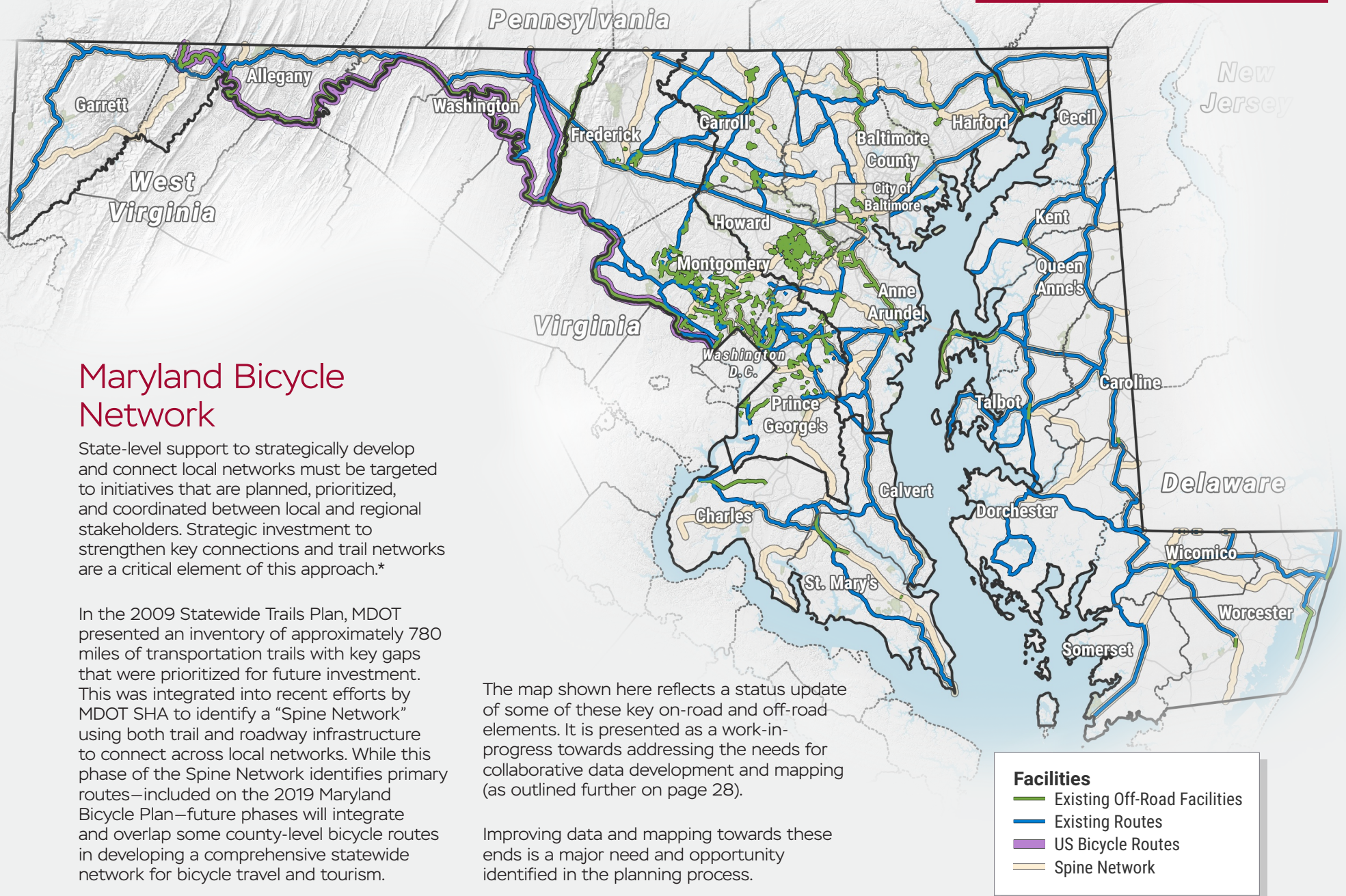
Maryland Bicycle Network

State-level support to strategically develop and connect local networks must be targeted to initiatives that are planned, prioritized, and coordinated between local and regional stakeholders. Strategic investment to strengthen key connections and trail networks are a critical element of this approach.*

In the 2009 Statewide Trails Plan, MDOT presented an inventory of approximately 780 miles of transportation trails with key gaps that were prioritized for future investment. This was integrated into recent efforts by MDOT SHA to identify a “Spine Network” using both trail and roadway infrastructure to connect across local networks. While this phase of the Spine Network identifies primary routes—including on the 2019 Maryland Bicycle Plan—future phases will integrate and overlap some county-level bicycle routes in developing a comprehensive statewide network for bicycle travel and tourism.

The map shown here reflects a status update of some of these key on-road and off-road elements. It is presented as a work-in-progress towards addressing the needs for collaborative data development and mapping (as outlined further on page 28).

Improving data and mapping towards these ends is a major need and opportunity identified in the planning process.



*Refer to the Maryland Land Preservation and Recreation Plan for additional trail and linkage information

Sources: Existing Off-Road Facilities - 2009 Statewide Trails Plan MDOT-TSO; Existing Routes - 2015 State Highway Administration Statewide Bicycle Map (Local Routes); Spine Network - 2018 State Highway Administration

Bicycle and Pedestrian Funding

Maryland stakeholders have access to a wide variety of state, federal, and local programs to support the improvement of infrastructure for biking and walking. This includes several discretionary programs administered by MDOT that are key elements of this process and includes hosting annual workshops and webinars to assist potential partners in project development. This plan includes several measures intended to strengthen the effectiveness of these limited resources, while also highlighting the ongoing need to identify new funding sources to achieve plan outcomes. A summary of eligible activities supported by these programs is provided below and included in Appendix B.

Program Overview and Eligible Activities

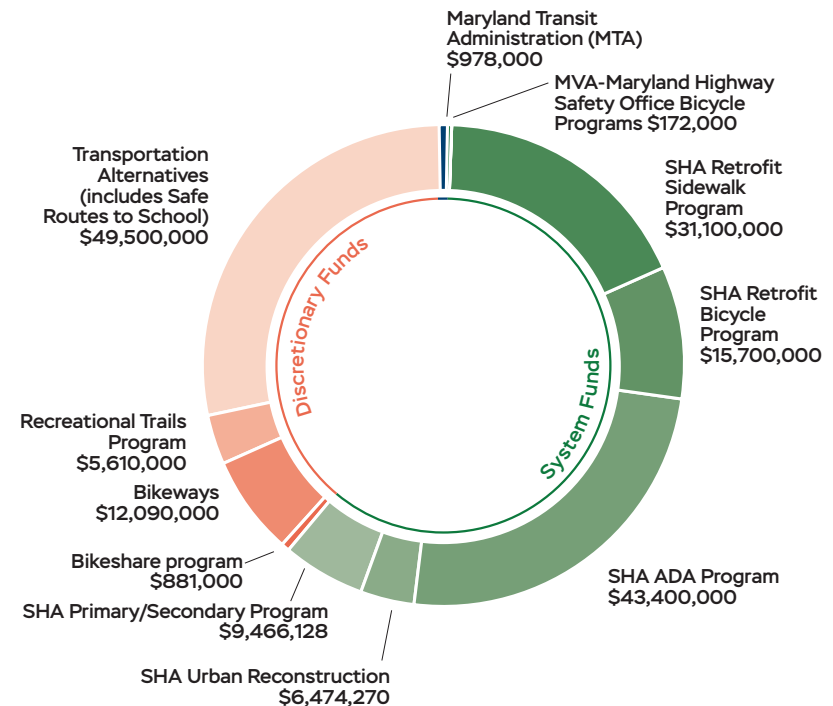
Key MDOT-Administered Programs

Eligible Activities	Transportation Alternatives (TA)	Safe Routes to School	Recreational Trails Program (RTP)	Bikeways	SHA Retrofit	Bike/Ped Priority Area (BPPA)*
Develop concept; planning						✓
Include in local plans and priorities						✓
Build support and partnerships						✓
Refine the concept				✓	✓	
Design	✓	✓		✓	✓	
Secure permits	✓	✓		✓	✓	
Construct	✓	✓	✓	✓	✓	
Maintain			✓			
Educate and promote		✓	✓	✓		

* Bicycle Pedestrian Priority Areas (BPPAs) facilitate the coordination and planning of bicycle and pedestrian facilities in areas with a high potential for bicycling and walking (technical assistance program)

MDOT also invests in system-level improvements to address bicycle and pedestrian access, and these funding commitments are called out separately as part of MDOT's annual Consolidated Transportation Program (CTP). Proportional funding amounts for both discretionary and system-level funds are summarized in the diagram below. Local partners are encouraged to include consideration of bicycle and pedestrian projects as part of the annual "priority letters" (letters outlining jurisdictional priority projects) that inform the development of the six-year CTP.

FY18 CTP Projected Funding 2018-2023



There are other state programs that support bicycle and pedestrian projects. MDOT coordinates with other agencies on program opportunities, including the Maryland Heritage Area Authority (MHAA), the Transportation Land Use Connections (TLC) program, the Sustainable Communities/Community Legacy programs, and Program Open Space. More details on all of the programs mentioned are provided in Appendix B.

Pedestrian Safety

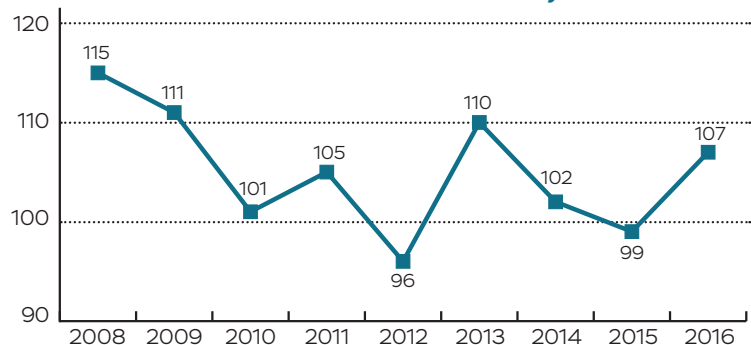
Pedestrian safety is a growing concern and a critical challenge in Maryland. After a decline between 2008 and 2010, Maryland witnessed a 21% increase in pedestrian-involved crashes between 2011 and 2016, with pedestrians accounting for 21% of statewide fatalities.

In 2016, serious injuries to pedestrians also increased markedly from the previous year, from 320 to 419. Nationally, since 2007, pedestrian fatalities have been increasing in proportion to all roadway deaths, drawing attention to those factors that most affect pedestrian safety: vehicle speed, larger vehicle size, and distracted driving. Maryland's statistics are associated with an increase in VMT, which indicates the need for improved infrastructure, particularly in areas where people walk along or across high-speed roadways.

Pedestrian Serious Injuries in Maryland



Pedestrian Fatalities in Maryland

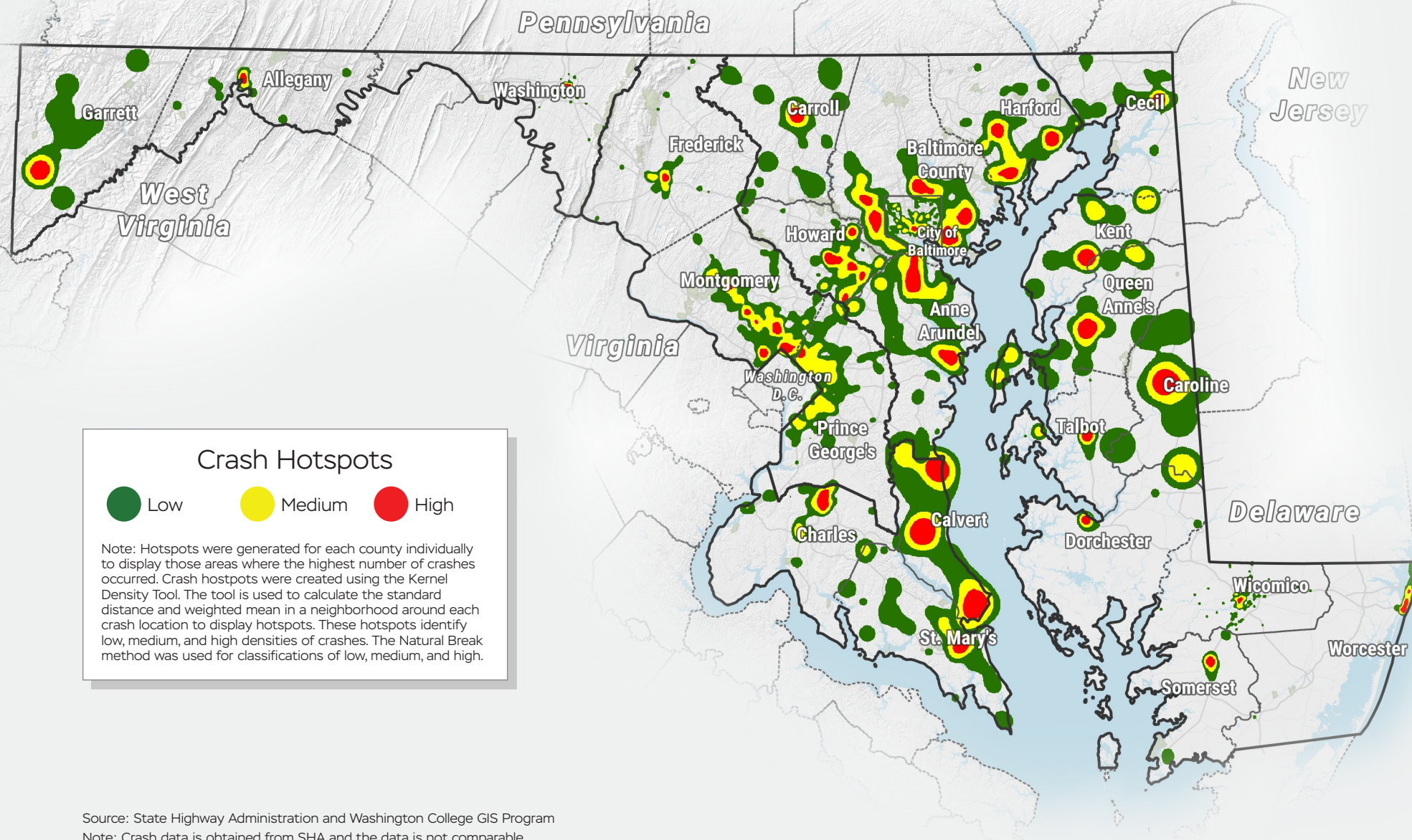


The risk to pedestrians has prompted a call-to-action among stakeholders in Maryland. This is reflected in the 2016-2020 State Highway Safety Plan (SHSP) and further documented in the 2018 Highway Safety Plan (HSP). Led by the Maryland Highway Safety Office (MHSO), a Pedestrian and Bicycle Emphasis Area Team formed in 2016 to develop strategies and to coordinate with local partners to address these critical safety concerns.

The SHSP provides a tool to identify and implement engineering, enforcement, and educational safety improvements, and this work is integral to the safety aspect of the Plan. The planning processes involved in both the SHSP and the BPMP are collaborative and complementary, with many of the same stakeholders informing both discussions. While the SHSP and HSP focus on analyzing and introducing countermeasures to reduce the scope and severity of crashes, the BPMP shapes policies and projects to encourage more pedestrian activity across the state, and guide investments to improve connectivity, access, and safety. In addition, safety-related campaigns such as "Look Up. Look Out" were developed by MDOT to raise awareness between pedestrians and drivers in curbing serious injuries and deaths throughout Maryland.



Maryland Pedestrian Crash Hotspots, 2012 to 2016



Source: State Highway Administration and Washington College GIS Program

Note: Crash data is obtained from SHA and the data is not comparable to those released by the Maryland State Police to the Open Data Portal (data.maryland.gov).

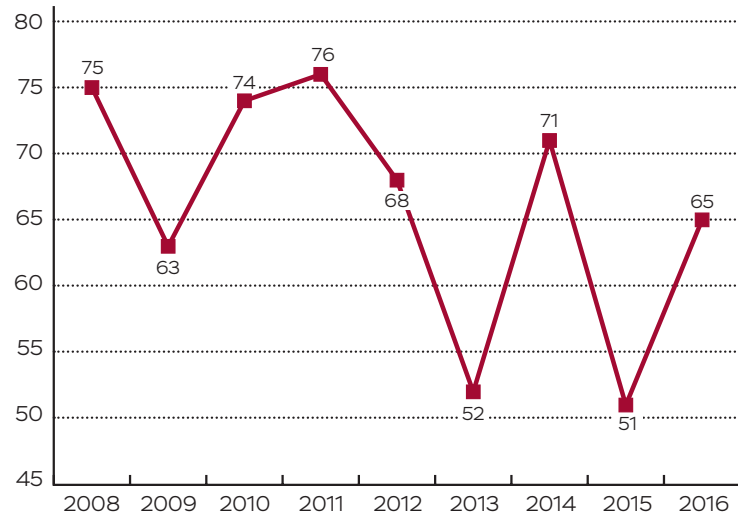
Restriction of Liability: Although every effort was made to provide useful and accurate information, Washington College and the Maryland Highway Safety Office make no claims, promises, or guarantees about the accuracy, completeness, or adequacy of the contents of these maps and expressly disclaim liability for any errors or omissions in the contents of these documents.

Disclaimer: The crashes displayed on the map, as well as any other information, is limited in its scope and purpose. It was compiled and collected for the purpose of identifying, evaluating, and planning safety enhancements, utilizing Federal-aid highway funds pursuant to sections 130, 144 and/or 148 of Title 23 of the United States Code.

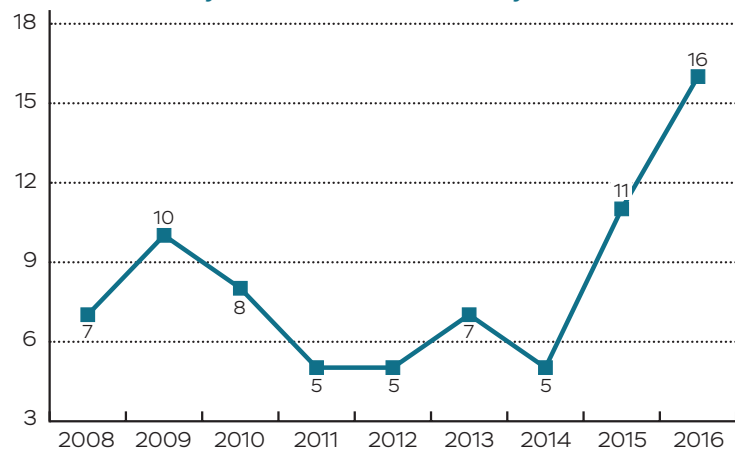
Bicyclist Safety

Bicyclists are vulnerable on Maryland's roadways as fatalities in Maryland have been increasing over the past few years (in 2016, there were 16 reported fatalities, compared to 11 or fewer in all previous years since 2008).

Bicycle Serious Injuries in Maryland



Bicycle Fatalities in Maryland



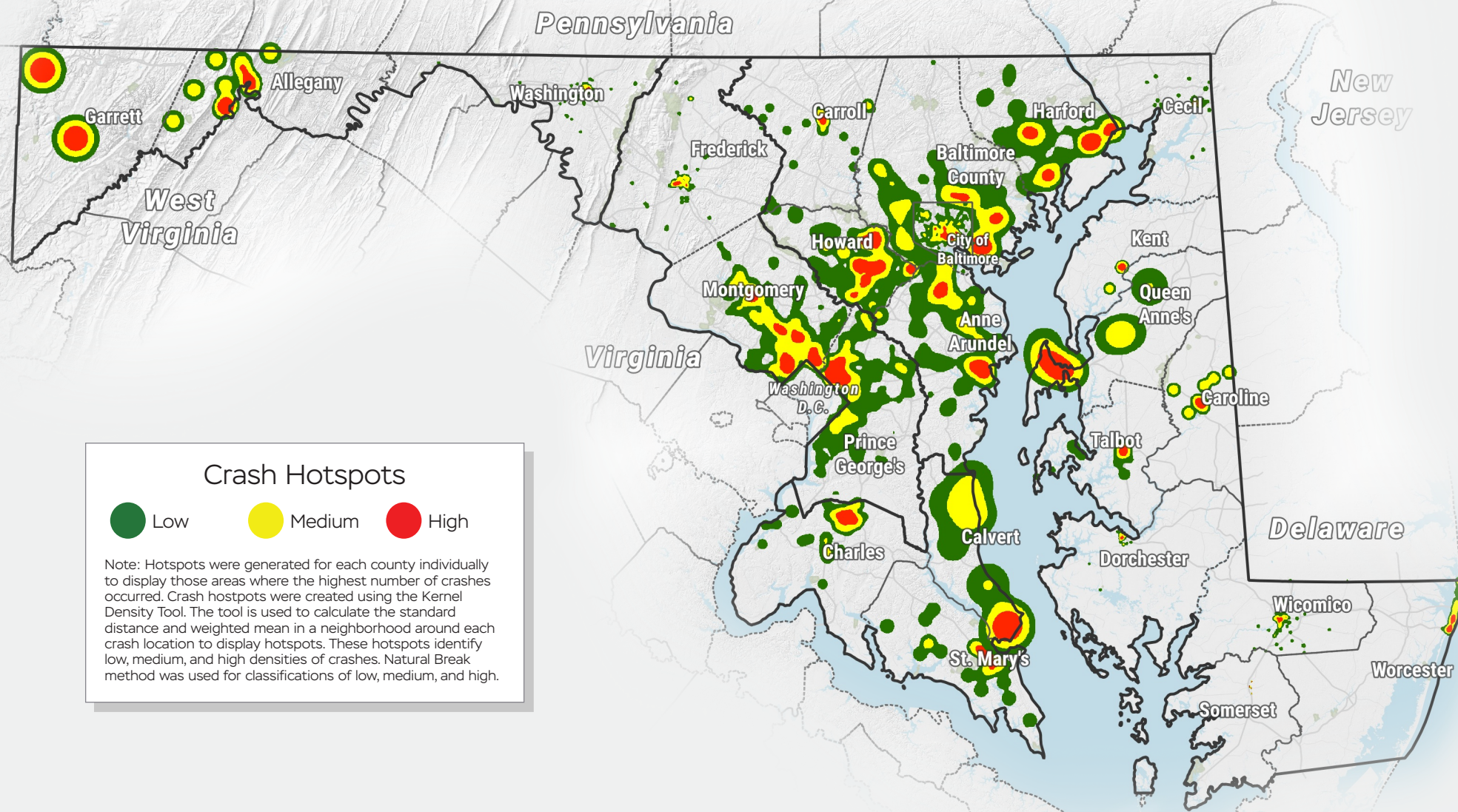
Although some of these increases reflect broader trends (fatalities across the U.S. increased in this period from 1.7% in 2007 to 2.2% in 2016), Maryland's statistics prompted the creation of a new Emphasis Area Team in the SHSP process. While the SHSP provides a more in-depth analysis for improving the safety of bicyclists (and pedestrians) through enforcement, engineering, and education throughout the state, these safety concerns also prompted the creation by statute of a Task Force to Study Bicycle Safety on Maryland Roadways.

The Task Force was comprised of a broad range of stakeholders who worked together in developing a list of recommendations (39 total) that were published in their December 2017 report. While several recommendations require consideration and implementation by the legislature, enforcement agents, and ongoing SHSP efforts, this Plan outlines a path to advance several of the infrastructure-related elements as set forth by the Task Force.



A Bicyclist May Be Someone You Know" awareness campaign is one of several MDOT programs that educates drivers in promoting bicycle safety.

Maryland Bicycle Crash Hotspots, 2012 to 2016



Source: State Highway Administration and Washington College GIS Program

Note: Crash data is obtained from SHA and the data is not comparable to those released by the Maryland State Police to the Open Data Portal (data.maryland.gov).

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Region Overview

Each of Maryland's regions present unique characteristics, challenges, and opportunities for bicycling and walking, and key decisions about how to prioritize projects and investments are often determined at the regional level.

Many of the initiatives outlined in this plan are intended to help strengthen tools and provide needed resources for regional and local jurisdictions and municipalities. MDOT, for example, supported Department of Natural Resources (DNR) efforts in 2016-2017 to convene workshops that identified priorities for regional trail development. This process, as well as ongoing work to develop

Strategic Highway Safety Plans, Land Preservation and Recreation Plans, Sustainable Community strategies, Heritage Area plans, and other state, local and regional planning initiatives, demonstrates how MDOT is working to aid locals in the planning and prioritization of bicycle-and pedestrian-related projects.

The following pages are intended to provide an overview of some of the assets and resources, as well as limitations, that constitute each of Maryland's regions.



Western Maryland has exciting opportunities to leverage existing park and trail assets for recreation and activity-based tourism. Everyday connectivity to enhance bicycling and walking for residents is an important strategy for improving the livability and attractiveness of communities in these areas.

Trends

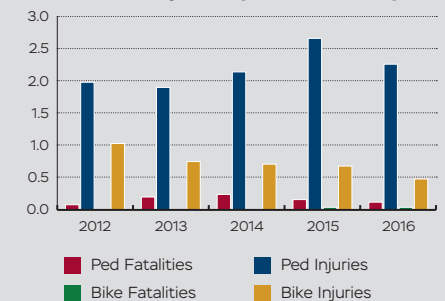
-0.3% population growth 2010-2016
2.8% commute by bike/walk
9% Households with no access to vehicle

U.S. Census Bureau, American Community Survey 2017

In this region, recent program investments focused largely on improvements and connectivity for the Great Allegheny Passage and the Chesapeake and Ohio (C&O) Canal Towpath trails. Based on feedback from recent workshops and outreach, there is a clear interest in enhancing biking and walking access for both visitors and residents.

Although there is momentum to support biking and walking in the region, the current access to planning resources is unevenly distributed. Local capacity to leverage programs and assets could be improved by enhanced access to data and strategic planning resources.

Western Maryland Pedestrian & Bicyclist Fatalities and Injuries, per 10,000 Population



Maryland Department of Transportation Highway Safety

Sample Assets and Resources

Planning Resources:

- Appalachian Regional Commission
- Cumberland Area Metropolitan Planning Organization (CAMPO)
- Hagerstown/Eastern Panhandle Metropolitan Planning Organization
- Walking Plan Assessments: Allegany, Garrett, and Washington Counties
- Garrett Trails, C&O Canal Trust and the Allegany Trail Alliance
- Trail Town and Canal Town Networks

Partners and Stakeholders:

- Mountain Maryland Heritage Area
- Canal Place Heritage Area
- Heart of the Civil War Heritage Area
- Mountain Maryland Trails

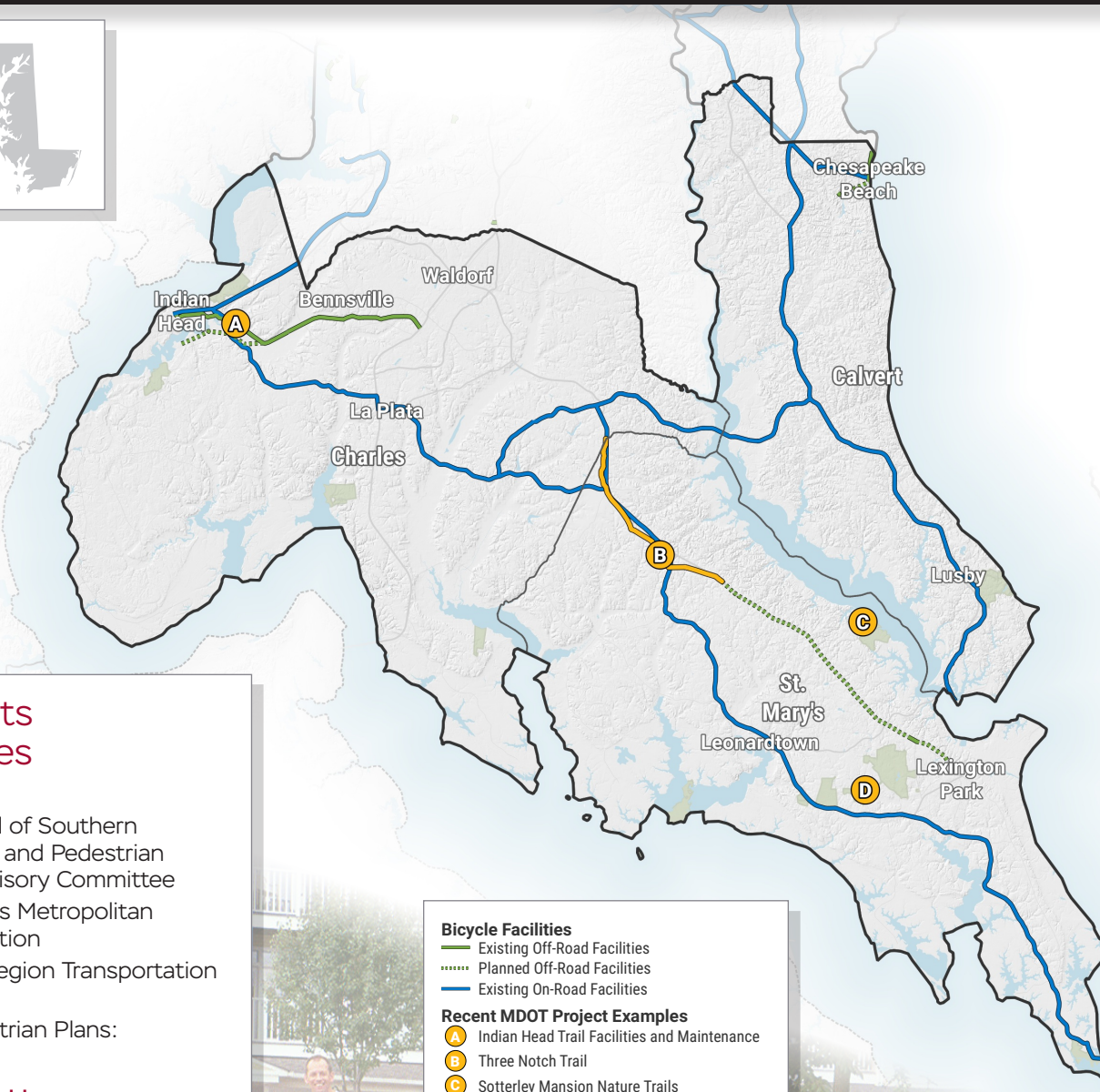
Bicycle Facilities

- Existing Off-Road Facilities
- Planned Off-Road Facilities
- Existing Routes

Recent MDOT Project Examples

- A Cumberland Gap Connection
- B Conococheague Creek Aqueduct
- C Marsh Run Multi-Use Trail
- D Big Slackwater Gap
- E C&O Trail Restoration
- F Western Maryland Rail Trail

Photo: MD DNR Flickr page Rocky Gap State Park



Sample Assets and Resources

Planning Resources:

- Tri-County Council of Southern Maryland - Bicycle and Pedestrian Infrastructure Advisory Committee
- Calvert - St. Mary's Metropolitan Planning Organization
- National Capital Region Transportation Planning Board
- Bicycle and Pedestrian Plans: Charles County

Partners and Stakeholders:

- Southern Maryland Heritage Area
- Bicycle Clubs: Patuxent, Solomons Island, Oxon Hill
- American Chestnut Land Trust

Southern Maryland is one of the state's fastest growing regions, and it has several transportation challenges emerging from regional network needs and land development patterns. Recent key investments to support biking and walking focused on areas such as Indian Head, Sotterley Mansion, Waldorf, and St. Mary's. Work also continues on construction of the Three Notch Trail.

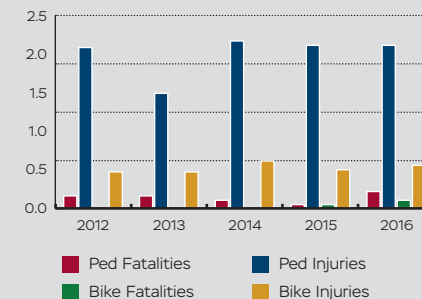
Trends

- 6.1%** population growth 2010-2016
- 1.5%** commute by bike/walk
- 4%** Households with no access to vehicle

U.S. Census Bureau, American Community Survey 2017

While the counties generally have access to a planner to support bicycle and pedestrian efforts, not all jurisdictions have an adopted bicycle and pedestrian plan. In the BPMP update meetings, stakeholders from this area emphasized the need for better agency coordination and improved design to enhance the safety and attractiveness of state highways for cyclists and pedestrians. Sidewalk connectivity is also a major theme in local strategies to support state-designated Sustainable Communities.

Southern Maryland Pedestrian & Bicyclist Fatalities and Injuries, per 10,000 Population



Maryland Department of Transportation Highway Safety Office

Sample Assets and Resources

Planning Resources:

- Advocacy/Advisory Groups: College Park, Frederick, Gaithersburg, Rockville, Washington Area Bicyclists Association, Capital Trails Coalition, Perils for Pedestrians
- Maryland-National Capital Park and Planning Commission
- Metropolitan Washington Council of Governments-Bike/Ped Subcommittee
- Bicycle and Pedestrian Master Plans: Frederick, Montgomery, and Prince George's Counties
- Safety Planning: Montgomery County - Vision Zero, Prince George's County Strategic Roadway Safety Plan

Partners and Stakeholders:

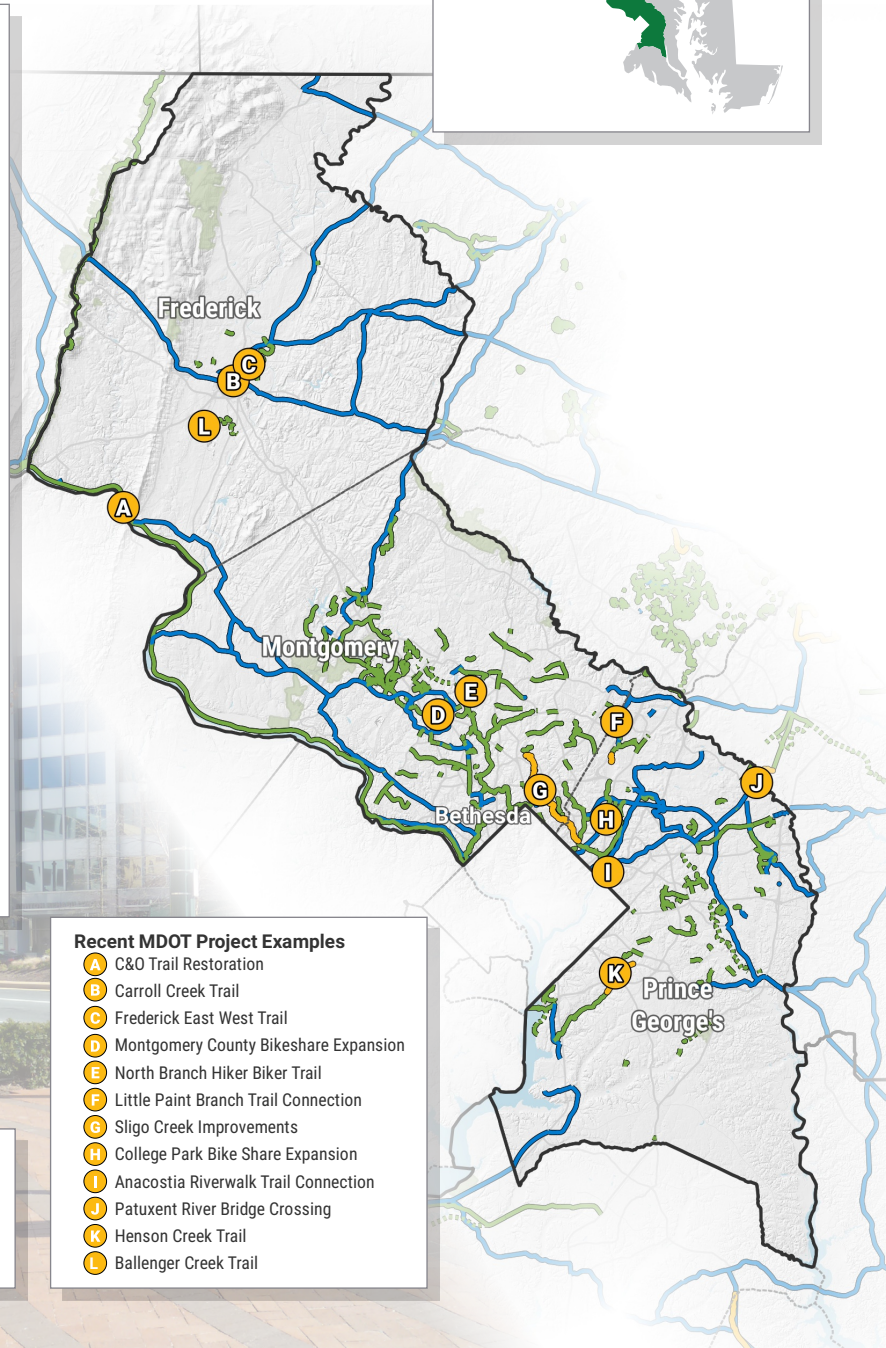
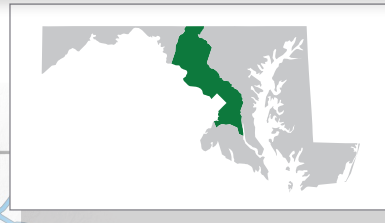
- Heritage Montgomery
- Anacostia Trails Heritage Area
- Heart of the Civil War Heritage Area

Recent MDOT Project Examples

- A C&O Trail Restoration
- B Carroll Creek Trail
- C Frederick East West Trail
- D Montgomery County Bikeshare Expansion
- E North Branch Hiker Biker Trail
- F Little Paint Branch Trail Connection
- G Sligo Creek Improvements
- H College Park Bike Share Expansion
- I Anacostia Riverwalk Trail Connection
- J Patuxent River Bridge Crossing
- K Henson Creek Trail
- L Ballenger Creek Trail

Bicycle Facilities

- Existing Off-Road Facilities
- Planned Off-Road Facilities
- Existing Routes
- Planned Routes



The counties comprising the Washington Metro Region are rich in trail and transit assets, which support a higher percentage of non-automobile commuting trips. However, this region also includes many suburban and urban areas with high volumes of through traffic and inadequate sidewalks and crossings. The radial and beltway road networks and at-grade rail crossings that traverse much of the area pose as barriers that are hazardous for pedestrians and bicyclists. These physical barriers are then complicated by institutional barriers and the complex relationships by which much of this region functions.

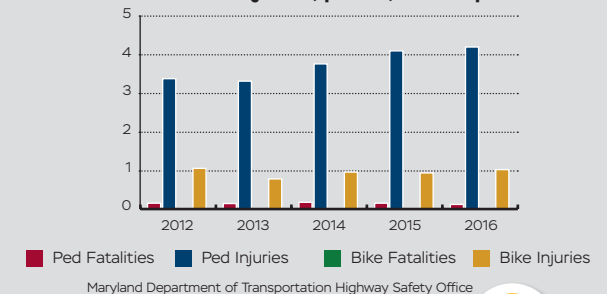
Trends

- 6.3%** population growth 2010-2016
 - 2.5%** commute by bike/walk
 - 8%** Households with no access to vehicle
- U.S. Census Bureau, American Community Survey 2017

In recent years, strong partnerships focused efforts on expanding and improving the trail networks (including in the City of Frederick), completing the final links in the Anacostia Riverwalk Trail into Washington, DC and the Purple Line transit project. There are also several ongoing efforts to improve the safety of crossing state roadways (especially for trails and transit) and expanding bikeshare to facilitate everyday transportation needs.

The Washington Metro region benefits from very strong planning and advocacy organizations, some of which are unique to the area's specific assets. Prince George's and Montgomery Counties are particularly active in developing strategic highway safety plans to address safety concerns in the area.

Washington Metro Pedestrian & Bicyclist Fatalities and Injuries, per 10,000 Population





Sample Assets and Resources

Planning Resources:

- Baltimore Region Transportation Board: Bicycle and Pedestrian Advisory Group
- Trail Groups/Coalitions: East Coast Greenway, Baltimore Greenway Trail Coalition, Catonsville Rails to Trails
- County-Level Bicycle and Pedestrian Plans (All Counties)

Partners and Stakeholders:

- Baltimore National Heritage Area
- Lower Susquehanna Heritage Greenway
- Four Rivers Heritage Area
- Patapsco Heritage Greenway

The Baltimore Region has great potential for increasing the number of residents who bike and walk for both recreation and commuting. In many communities, considerable progress was made in recent years to design and implement trail extensions, and to retrofit existing roadways to establish bicycle and pedestrian networks.

Trends

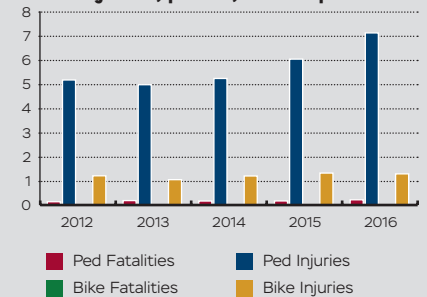
- 3.3%** population growth 2010-2016
- 3%** commute by bike/walk
- 11%** Households with no access to vehicle

U.S. Census Bureau, American Community Survey 2017

In Baltimore City, for example, efforts to improve bike connectivity to transit and implement a downtown bicycle network continues to expand—this includes the implementation of the Maryland Avenue Cycle Track. A number of trail connectivity projects are also moving forward, including a critical linkage in the Washington, Baltimore and Annapolis (WB&A) trail that connects Prince George's and Anne Arundel Counties.

Planning resources available for biking and walking activities are expanding alongside a growing recognition of the great needs and opportunities for biking and walking in the area.

Baltimore Pedestrian & Bicyclist Fatalities and Injuries, per 10,000 Population



Maryland Department of Transportation Highway Safety Office

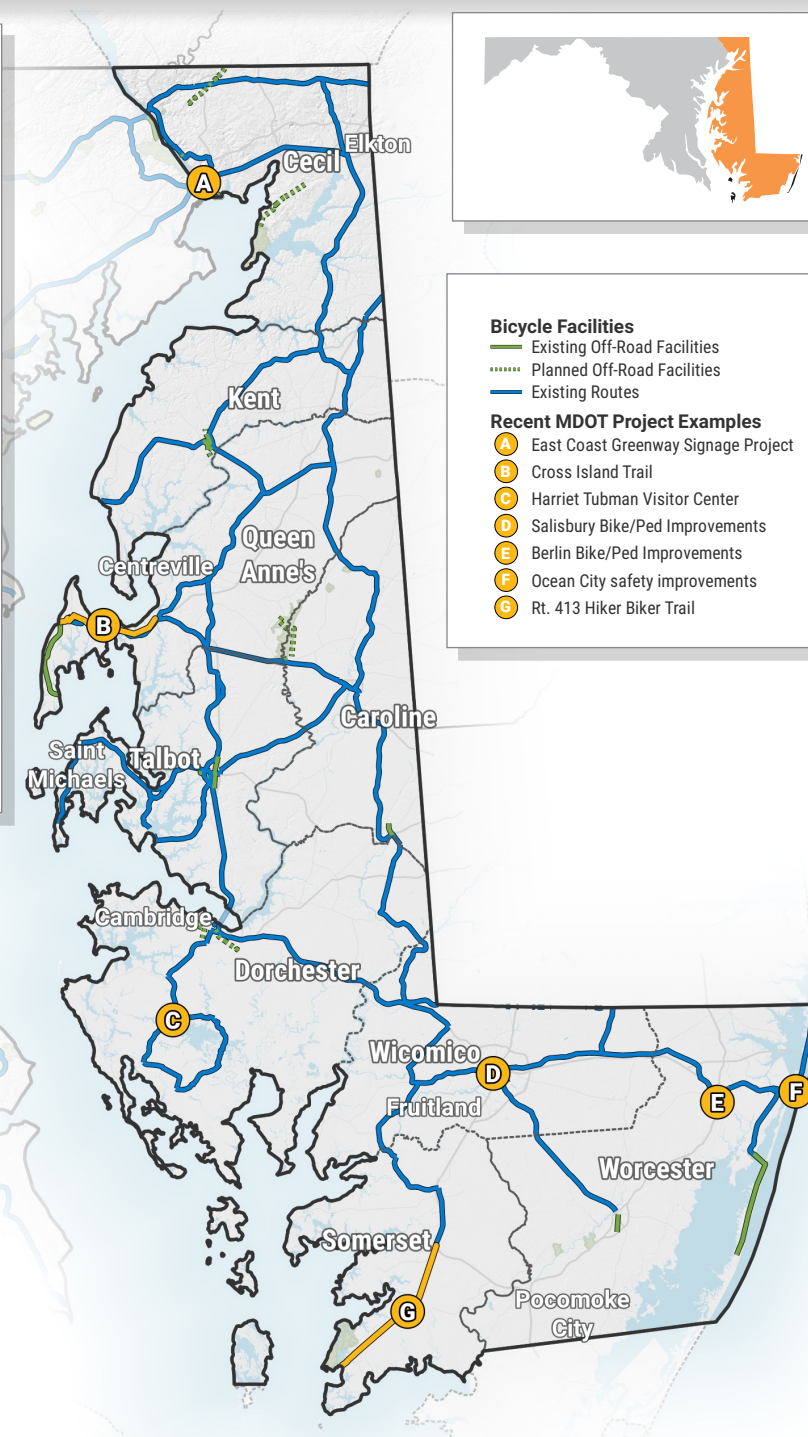
Sample Assets and Resources

Planning Resources:

- Wilmington Area Planning Council Non-motorized Working Group (WILMAPCO)
- Bike Salisbury (Bike SBY)
- Salisbury-Wicomico Metropolitan Planning Organization (S/WMPO)
- Tri-County Council for the Lower Eastern Shore
- Local Bike/Ped Plans: Salisbury, Berlin, Cecil County, Perryville, Charles County
- Walking Plan Assessments: Caroline/Dorchester, Somerset, Wicomico, and Worcester

Partners and Stakeholders:

- Stories of the Chesapeake Heritage Area
- Heart of Chesapeake Country Heritage Area
- Lower Eastern Shore Heritage Area
- Lower Susquehanna Heritage Greenway
- Eastern Shore Land Conservancy (ESLC) and Lower Shore Land Trust



The Eastern Shore of Maryland is rich in attractive destinations and scenery that benefit from an emphasis on active tourism and desirable amenities to attract and protect cyclists and pedestrians. The relatively even topography and the wide range of natural and heritage resources create a strong basis for continued strategic investment in trail connectivity, sidewalks, and main streets.

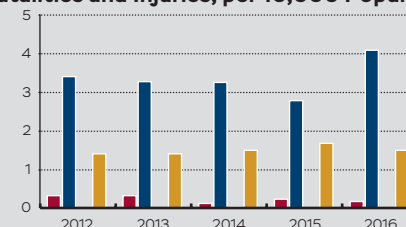
Trends

10% population growth 2010-2016
2.7% commute by bike/walk
7% Households with no access to vehicle

U.S. Census Bureau, American Community Survey 2017

In addition to the safety initiatives in Ocean City (see Illustrative Project on page 28), recent programs are devoted to extending the trail network. An ongoing initiative was launched in Somerset County in 2018. While momentum and attention to biking and walking access is growing in some key towns (Salisbury and Berlin, for example), plans and planning resources to strategically improve biking and walking are limited at the county level.

Eastern Shore Pedestrian & Bicyclist Fatalities and Injuries, per 10,000 Population



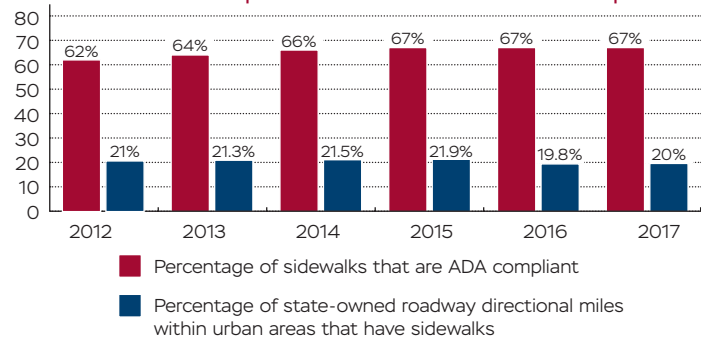
Legend: Ped Fatalities (Red), Ped Injuries (Blue), Bike Fatalities (Green), Bike Injuries (Yellow)

Maryland Department of Transportation Highway Safety Office

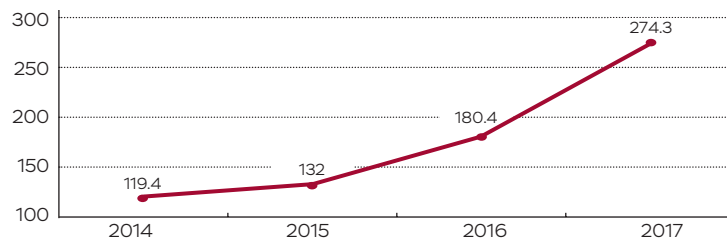
Recent Statewide Accomplishments

Infrastructure

Sidewalk Completeness and ADA Compliance



Number of Directional Miles Improved for Bicycle Access on State Highways



In addition to the discretionary grant programs described on page 13, MDOT has invested in bicycle and pedestrian retrofits and ADA-compliant projects to improve conditions on the state road network.

FY 2014 to 2018 Investments:

\$24.6 Million
to improve and
construct sidewalks
along state roadways

\$67.2 Million
to improve compliance
with the Americans
with Disabilities Act

\$15.4 Million
to address bicycle
retrofits on state
roadways

Multimodal Connectivity



36
new and
replacement
bike racks at
MTA rail stations



30
new MARC cars
to accommodate
bicycles on Penn,
Camden, and
Brunswick lines



Increase
in the number
of bikeshare
stations at
transit stations
statewide



**Indoor
cardio-
track**
installed at
BWI airport

Planning



24
total number of
bicycle and pedestrian
plans completed by
Maryland counties



12
newly designated
Bicycle and Pedestrian
Priority Areas



3
completed Bicycle
and Pedestrian
Priority Area plans

Safety



Created Pedestrian and
Bicycle Area Emphasis
Team to advance the
strategic highway
safety initiative



Task force developed
39 recommendations
to improve
bicycle safety



Updated design
guidelines and passed
new crosswalk
legislation

Note: Data and statistics were compiled by MDOT State Highway Administration, Maryland Transit Administration, Motor Vehicle Administration, and Maryland Aviation Administration.

The BPMP Update responds to major changes across the state, federal, and local landscapes. Based on research and outreach related to trends, needs, and opportunities, the following themes emerged. These themes helped establish the basis for the goals, objectives, and strategies for the Plan update.



NEW TECHNOLOGY AND DATA

The rapid expansion of bikeshare services, carsharing strategies, dockless bicycles, e-bikes, and electric scooters, along with emerging technologies for connected and autonomous vehicles, are changing the way people bike and walk in Maryland. New computer applications and data collection techniques may provide opportunities to better understand travel choices and route planning.



SAFETY CONCERNS

Despite ongoing efforts to heighten safety awareness, crashes resulting in the death or serious injury of cyclists and pedestrians have increased in recent years. In response, a Pedestrian and Bicycle Emphasis Area Team was created in 2016 as part of the Maryland Strategic Highway Safety planning process. In 2017, concerns regarding bicycling safety resulted in a statutorily mandated publication, the Task Force to Study Bicycle Safety on Maryland Roadways: Findings and Recommendations, and the Plan update was informed by this publication.



NEW INITIATIVES TO SUPPORT "ACTIVE TRANSPORTATION"

There has been a recent expansion of planning and policy initiatives from organizations such as the Center for Disease Control, AASHTO, and AARP. The BPMP update process provides an opportunity for the state of Maryland to strengthen these partnerships and initiatives for improving bicycling and walking.



ECONOMIC IMPACT

Business owners and leaders within and beyond Maryland are increasingly pursuing opportunities to leverage the benefits of cycling and walking for their business development plans. The Maryland Office of Tourism is also working to capitalize on activity-based attractions for the state, as are many local jurisdictions who recognize the importance biking and walking as a form of attracting and retaining residents, visitors, and businesses to their communities.



EQUITY

A recurring theme from many of the conversations that helped shape the BPMP update was how supporting biking and walking in Maryland benefits all people who live, work, and play in Maryland. The Plan is intended to benefit all regions of Maryland equitably, as each is an integral element of a broader multimodal strategy for transportation.



COMPLETE STREETS AND MAJOR BRIDGES/HIGHWAYS

Maryland adopted new legislation in 2018 to promote the adoption of Complete Streets policies at the state and local level, and this plan signals MDOT's intent to advance this agenda. The Maryland Transportation Authority (MDTA) was specifically excluded from the Complete Streets legislation, due to MDTA's independent requirements under its Trust Agreement as an agency funded exclusively by toll revenues (not taxes). Furthermore, due to the nature of MDTA's facilities, many of which are high speed, bicycle and pedestrian access is legally prohibited in most circumstances. When authorized by the Chairman of the Maryland Transportation Authority, MDTA will evaluate the inclusion of bicycle and pedestrian access at appropriate locations.

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CHAPTER 3

Goals, Objectives, and Strategies

This chapter lists the Plan's goals, objectives, and strategies. These reflect the prioritized focus areas that guide investment and promote action to advance Maryland's vision for safe biking and walking. For each goal, an illustrative project is provided to demonstrate potential outcomes.



Goal 1: Safety

Improve the Safety of Bicycle and Pedestrian Travel through Education, Enforcement, and Infrastructure Solutions

Objective 1.1

Reduce the number of bicycle and pedestrian lives lost and injuries sustained on Maryland's transportation system

Strategies

1.1a Continue to improve data collection techniques and access to safety data to support efforts to plan for and implement safer networks

1.1b Refine techniques for understanding and evaluating safety issues and areas of concern

1.1c Implement effective design solutions and countermeasures to enhance safety of infrastructure

Objective 1.2

Improve the maintenance and operations protocols that support safe access for pedestrians and bicyclists

Strategies

1.2a Improve methods for identifying maintenance and safety concerns and for communicating them to appropriate agencies

1.2b Enhance protocols that ensure safe access for pedestrians and cyclists during the construction phase of infrastructure projects

Objective 1.3

Improve education, enforcement, and training to support safe driving, biking, and walking

Strategies

1.3a Regularly update and effectively communicate information on new safety laws and technologies

1.3b Improve training and education for all roadway users and design professionals in emphasizing bicycle and pedestrian safety

Performance Metrics:

Statistics for fatalities and serious injuries continue to be acquired and compared with targets established by the SHSP. New baseline measures to estimate "exposure" data (i.e., number of people biking and walking) will be developed to improve understanding of actual progress and need. Continue with the Toward Zero Deaths approach in working to reduce bicycle and pedestrian fatalities and serious injuries in Maryland.

Estimated Cost:

\$50 million to \$120 million

*Estimates are based on current program expenditures with additional consideration for future system improvements and expansion. Figures are not intended for programming purposes.

ILLUSTRATIVE PROJECT

Eastern Shore Pedestrian Safety Campaign

In 2018, MDOT SHA completed a 2.8-mile, \$8.4 million project to enhance pedestrian safety along MD 528 (Coastal Highway) in Ocean City. This project includes new median fencing between MD 90 (Ocean City Expressway) and Convention Center Drive, and is designed to help guide pedestrians to designated safe-crossing areas. Signal timing adjustments, new traffic signals, and sidewalk upgrades were also added in key areas. In addition, a safety improvement campaign called "Walk Smart OC!" was created to encourage all road users to make safe, smart decisions while traveling on Coastal Highway and nearby roadways. MDOT has also supported several ongoing safety awareness campaigns including the launch, in 2018, of the "Street Smart" campaign, "Look Up! Look Out!", and "A Bicyclist Might Be Someone You Know." These efforts are addressed more directly on an ongoing basis as part of the SHSP process.





Goal 2: Connected Networks

Enhance Transportation Choice and Multimodal Connectivity through Linked Networks

Objective 2.1

Leverage strategic investment in planned routes to support the creation, identification, and use of safe, lower-stress routes for biking and walking for all user groups

Strategies

2.1a Strategically invest to address and prioritize eliminating gaps and barriers in strengthening the bicycle and pedestrian network

2.1b Develop tools and provide guidance to identify missing links and remove barriers to bicycle and pedestrian travel as part of implementation of the Complete Streets initiative

2.1c Use best practices to characterize facility use and context to help ensure appropriate treatments are integrated into project development and maintenance processes

Objective 2.2

Improve bicycling and walking accessibility to all transit facilities

Strategies

2.2a Target specific bus stop and transit station area improvements to enhance pedestrian and bicycle infrastructure access

2.2b Expand and improve facilities to accommodate bicycles on transit vehicles, including locally operated transit services, buses, Metro, Light Rail, and commuter rail (MARC)

2.2c Evaluate potential for secure bicycle parking at select MARC, Metro SubwayLink, and Light RailLink stations

Performance Metrics:

Key elements to inform future metrics are under development, that include Level of Traffic Stress (LTS) analysis, Spine Network Mapping, and Short Trip Opportunity Areas. In reference to lower-stress routes, Bicycle Level of Comfort analysis is no longer sufficient as a metric to guide network improvements. LTS will be used in developing more specific targets to guide sidewalk, trail, and bike infrastructure development. Until this data is created, existing measures will be used.

Estimated Cost:

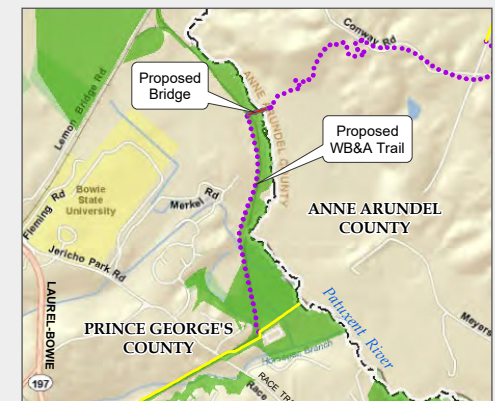
\$800 million to \$2.2 billion

*Estimates are based on current program expenditures with additional consideration for future system improvements and expansion. Figures are not intended for programming purposes.

ILLUSTRATIVE PROJECT

WB&A Trail Bridge

A \$4.7-million investment by MDOT will close a key gap on the WB&A Trail by constructing a highly anticipated bridge over the Patuxent River that connects Prince George's and Anne Arundel Counties. The bridge will connect two 6-mile trail segments, giving bicyclists and pedestrians a 12-mile trail that connects communities on either side of the river to jobs, retail, parks, and recreational opportunities.





Goal 3: Analysis and Planning

Support Efficient and Equitable Planning and Project Development with Data-driven Tools & Innovative Techniques

Objective 3.1

Improve access to data and decision tools to support effective and inclusive planning for all Maryland communities

Strategies

3.1a Provide assistance to support strategic planning and implementation of context-appropriate bicycle and pedestrian infrastructure

3.1b Improve access to data and best practice examples to evaluate alternatives, conduct outreach, and adopt effective policies and plans

Objective 3.2

Create tools to facilitate the development and delivery of more efficient, effective, and equitable projects

Strategies

3.2a Update guidance and policy documents on a regular basis to reflect industry best practices

3.2b Provide technical assistance to support the identification, prioritization, and implementation of projects and to cultivate relationships that can overcome physical and institutional barriers in the network

3.2c Compile and disseminate funding and project information to improve transparency and performance

Performance Metrics:

Compilation of multiple data sources for a newly created MDOT Bicycle/Pedestrian “Dashboard” with public access (continual updates and expansion of a web-based dashboard). Improve quality and coverage of planning resources (increase the number of counties and jurisdictions with adopted plans). Reduce time for project completion and the number of grant extensions required. Better articulate bicycle and pedestrian priorities (reflecting all agency inputs) in annual transportation priority letters.

Estimated Cost:

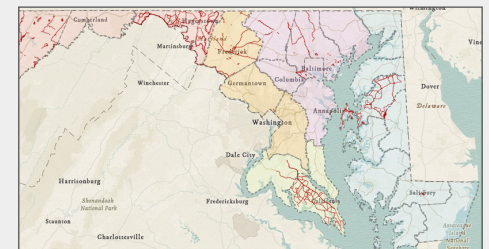
\$15 million to \$60 million

*Estimates are based on current program expenditures with additional consideration for future system improvements and expansion. Figures are not intended for programming purposes.

ILLUSTRATIVE PROJECT

Maryland GIS Bicycle Project

As part of the BPMP update process, and responding to the recommendations of the Bicycle Safety Task Force, MDOT conducted a survey to clarify needs and opportunities for building a unified GIS database of on-road and off-road bicycle infrastructure.



Working with local and regional partners, MDOT launched an effort in 2018 to create a single authoritative, comprehensive GIS database for bicycle networks to inform planning efforts. Through August of 2018, the project received data from 21 counties, 19 municipalities, 3 MPOs, and Baltimore City. This data is being compiled and standardized to create a statewide bicycle planning framework. Used by planning stakeholders, this database will help inform their efforts to both extend and connect gaps in the existing network (it is not intended for wayfinding purposes). This map will be made available through the Maryland iMap platform.



Goal 4: Partnerships

Build Partnerships to Promote Active Transportation and Strengthen the Health of our Communities

Objective 4.1

Leverage partnerships to encourage more Maryland residents of all ages, abilities, and income levels to participate in active transportation to meet more of their transportation needs

Strategies

4.1a Strengthen outreach and incentives promoting active commuting options

4.1b Develop new initiatives to support walking and biking for non-work trips

4.1c Provide support for planning and design decisions to promote the attractiveness and ease of biking and walking for Maryland residents

4.1d Expand partnerships and improve participation in active transportation events and planning meetings

Objective 4.2

Strengthen partnerships so Maryland communities are better equipped to implement active transportation solutions to achieve health and other benefits

Strategies

4.2a Develop data and metrics to help quantify the health benefits of active transportation

4.2b Support integration of health into local community development and revitalization strategies

4.2c Develop guidance and demonstration projects to support the expansion and maintenance of sidewalks and shared-use paths

Performance Metrics:

Increase participation in events, initiatives, and projects. Develop new partnerships in providing financial and political support. Improve data availability and the analysis of social determinants of health in relation to active transportation, land use, and environmental issues. Enhance local outreach to residents resulting in consensus and broader support for projects and compliance with safety regulations.

Estimated Cost:

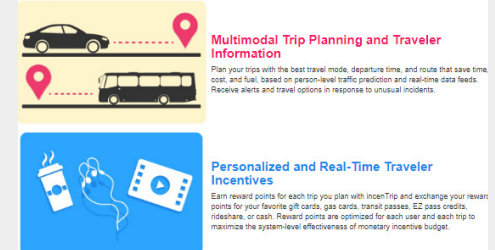
\$10 million to \$75 million

*Estimates are based on current program expenditures with additional consideration for future system improvements and expansion. Figures are not intended for programming purposes.

ILLUSTRATIVE PROJECT

incentTrip App

The incentTrip computer application uses personalized incentives to encourage walking and biking for short trips in the Baltimore and Washington, DC metro regions. Created by software developers at the University of Maryland, with MDOT data, the app considers individual preferences and real-time multimodal transportation network conditions to inform travel decisions.



It includes active-mode travel options, such as biking, walking, and bikeshare, and it integrates these with transit networks and schedule timetables to create viable door-to-door mobility solutions.



Goal 5: Economic Development

Advance Biking and Walking as an Economic Development Strategy

Objective 5.1

Develop biking and pedestrian facilities and programs to promote active tourism

Strategies

5.1a Support expansion of biking and walking infrastructure to support tourism and attract new visitors

5.1b Improve wayfinding and mapping to better connect users with amenities and businesses

5.1c Integrate active transportation options into tourism development strategies

Objective 5.2

Expand access to economic benefits of bicycling and walking to more Maryland residents and businesses

Strategies

5.2a Conduct analysis to help quantify economic impacts of biking and walking

5.2b Provide technical assistance, design guidance, and investment to improve access to commercial hubs and neighborhoods

5.2c Continue to support transit-oriented development and related opportunities that leverage multimodal access and attract businesses that prioritize bicycling and walking access

Performance metrics

Develop a metric to estimate the economic impact of bicycle and pedestrian investments, and track related revenues in conjunction with the Department of Commerce. Reduce percentage cost of transportation as a fraction of household income. Increase participation rates and distances traveled in running, walking, and biking events. Expand business participation in commuter choice programs and Trail Town Network partnerships.

Estimated Cost:

\$20 million to \$75 million

*Estimates are based on current program expenditures with additional consideration for future system improvements and expansion. Figures are not intended for programming purposes.

Canal trail. Photo source: Wikimedia Common

ILLUSTRATIVE PROJECT

C&O Canal Explorer Mobile App

Well-designed mobile computer applications help attract visitors by making it easier for them to find points of interest, plan trips, and find useful information to help guide their visits. The C&O Canal Explorer is a mobile app that helps visitors explore the 184.5 miles of the C&O Canal National Historical Park. Created by the park's official nonprofit partner, the C&O Canal Trust, it maps more than 600 points of interest in a searchable format, allowing users to find hiking trails, campgrounds, historic sites, trailheads, and parking.

With funding from the Maryland Heritage Area Authority, and maintained and updated by the C&O Canal Trust, the app requires only a modest subscription fee. It supports walking and biking by calculating the distance from the user's location to nearby amenities and points of interest.



CHAPTER 4

Key Initiatives

This chapter focuses on outlining specific actions to advance the goals and implement the strategies of the Plan. The five key initiatives include both short- and long-term targets, which will guide future efforts and support multiple goals.



1

Improving Statewide Connectivity

Improve connectivity to make biking and walking on the State Transportation Network possible for all user groups

This key initiative supports:



Goal 1:
Connected
Networks



Goal 2:
Safety

Short-term targets (5-year)

Level of Traffic Stress (LTS) analysis completed to inform creation of strategic plans and connected networks

Statewide bicycle and pedestrian infrastructure inventory (based on GIS) produced and updated

Bicycle and pedestrian infrastructure strategically expanded and improved at transit stations

Onboard transit facilities included on all commuter bus, MARC, and light rail

Completion of projects that address key network gaps

Long-term targets (20-year)

Consistent protocols to develop a network-level analysis to identify and prioritize barriers and maximize opportunities to ensure ongoing improvement of connectivity for bicycling and walking—including at intersections, state highway crossings, and bridges



State Roadway Network Level of Traffic Stress

Level of Traffic Stress (LTS) presents a new approach to assessing roadway conditions for bicycle and pedestrian accommodation. Responding to statewide needs, recognized shortcomings of the existing Bicycle Level of Comfort measure (see page 11), and inputs from MDOT's annual Attainment Report Advisory Committee, MDOT will use this methodology to assess and inform potential improvements to all of Maryland's roads and selected bicycle and pedestrian infrastructure.

Variables used in measuring traffic stress include:

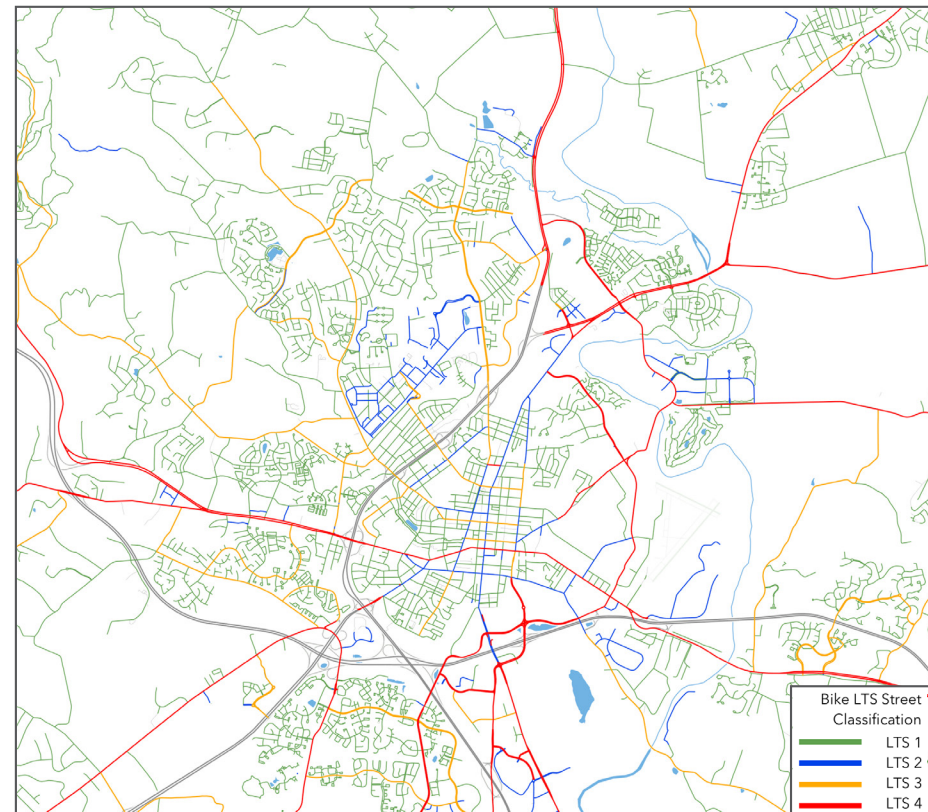
- speed limits
- number of travel lanes
- on-street parking presence and width
- bike facility presence and width (including physically separated bikeways and trails)
- traffic signals and traffic counts
- sidewalk condition and width
- buffer type and width
- illumination presence
- general land use
- presence of sidewalk ramps

LTS will help MDOT and partners to:

- assess network connectivity
- measure improvements to connectivity
- measure the percentage of trips and connected nodes
- facilitate an LTS-based performance measure
- develop a statewide measure focused on Short Trip Opportunity Areas (STOAs)
- strategically invest to make meaningful and cost-effective decisions that safely connect Maryland's bicycle and pedestrian networks

LTS Level	Target User Group
LTS 1	Most Children
LTS 2	Mainstream Adult Population
LTS 3	Enthusied and Confident
LTS 4	Strong and Fearless

Level of Traffic Stress - City of Frederick (Sample)



Source: This representative sample was created by the State Highway Administration for illustrative purposes only.

2

Developing Planning and Policy Tools

Create and update planning and policy tools to ensure consistency and support local and regional partner initiatives

This key initiative supports:



Goal 3:
Analysis and
Planning



Goal 4:
Partnerships

Short-term targets (5-year)

Elements of the Strategic Highway Safety Plan that address bicycle and pedestrian issues achieved

Existing tools to prioritize areas of need and opportunity (STOAs, BPPAs, and Pedestrian Road Safety Audits) refined or restructured

Complete streets policies adopted, strengthened, and expanded in order to effectively implement at the state, regional, and local levels

Update Bicycle Policy and Design Guidelines to reflect Best Practices and to better support local planning efforts

Develop new tools and frameworks to support the safe adoption and use of transportation technologies (electric scooters and automated vehicles)

Long-term targets (20-year)

Strong local context analysis continuously updated to provide more consistent and specific guidance on policy, planning, and design decision-making



Short Trip Opportunity Areas

The STOA map was developed to highlight areas where there is a high potential for walking or biking trips, and safety and infrastructure require special attention. The tool was initially created in response to Maryland statutory mandates related to the identification and designation of Bicycle and Pedestrian Priority Areas. As part of the Bicycle and Pedestrian Master Plan Update, efforts focused on ensuring that the map presents the best available data, best practices, and statistical consistency was a priority.

The map reflects the criteria listed below, and combines access to jobs, households, schools, and transit stops with households that have limited access to motor vehicles. This combination of variables is intended to address equity concerns, and includes large urban areas as well as small town centers and main streets. With further coordination at the regional and local level, this planning tool is used to help state, regional, and local partners plan projects and policies that respond to legislative mandates for Complete Streets and Bicycle and Pedestrian Priority Areas. It also helps regions and communities focus resources on strategic investments.

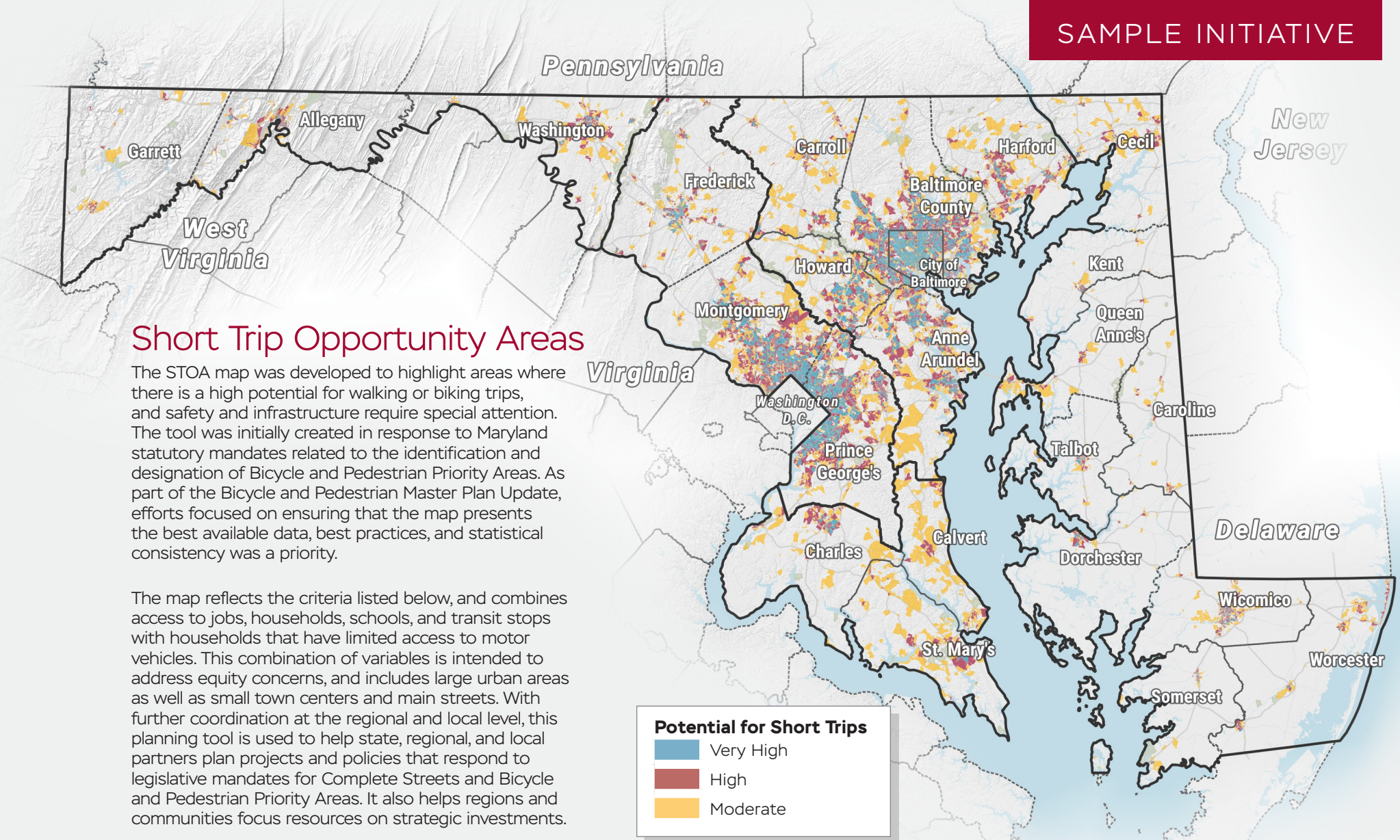
STOA Criteria

Variable	Weight
Population Density	25%
Employment Density	25%
Zero Car Households	10%
Transit Coverage	20%
School Coverage	20%

Potential for Short Trips

- Very High
- High
- Moderate

Note: In a study conducted by Maryland Highway Safety Office & Washington College GIS Program, it was found that approximately 65% of the total number of pedestrian and bicycle crashes reported between 2012 and 2016 had the likelihood to occur in the top three darkest areas (Very High, High, and Moderate) of the map.



3

Defining and Refining Programs

Implement new, and reposition existing programs to facilitate changes in statute and achieve plan goals and strategies

This key initiative supports:



Goal 1:
Connected
Networks



Goal 2:
Safety



Goal 3:
Analysis and
Planning

Short-term targets (5-year)

Implementation process initiated for the Complete Streets policy that identifies and prioritizes underserved and under invested communities

Bicycle and Pedestrian Priority Area (BPPA) program amended to address gaps and expedite progress in meeting local needs

Federal and state funding allocations that address bicycle and pedestrian issues strengthened and streamlined

Strengthen partnerships to support MDOT's Commuter Choice Maryland program in promoting alternatives to driving alone—such as biking and walking—that reduce congestion, conserve energy, protect the environment, facilitate economic opportunity, and encourage workplace wellness activities

Long-term targets (20-year)

Support local adoption of mode share plans to improve the capacity of active transportation networks statewide

4

Developing Better Data

Initiate efforts to improve problem-solving, project development, and planning initiatives

This key initiative supports:



Goal 2:
Safety



Goal 3:
Analysis and
Planning



Goal 4:
Partnerships

Short-term targets (5-year)

Demonstration projects launched to explore real-time data sources for identifying and prioritizing areas to improve safety, connectivity, and economic development

Network of Bicycle and Pedestrian traffic counters expanded and consolidated to reflect each region

Geospatial safety data (i.e., crash data) analyzed and shared with officials to improve education, enforcement, and engineering interventions

Standardized survey created and implemented to supplement available data to identify and address equity issues

Current information about legislative changes and transportation investments made more accessible

Long-term targets (20-year)

Creation of a web-based accessible database and increased staff resources focused on providing information for the development, funding, prioritization, and implementation of bicycle- and pedestrian-related projects for local and regional partners



5

Enhancing and Estimating Economic Impact

Pilot initiatives and materials that help strengthen and clarify the economic benefits of bicycling and walking activity in Maryland

This key initiative supports:



Goal 4:
Partnerships



Goal 5:
Economic
Development

Short-term targets (5-year)

Publish print and digital materials that highlight activity-based tourism (e.g., Spine Network, heritage destinations, Trail Towns, etc.)

Conduct statewide study of economic impacts of cycling and walking in Maryland

Analyze incentive programs for businesses focused on activity-based products and services (in coordination with the Maryland Department of Commerce)

Long-term targets (20-year)

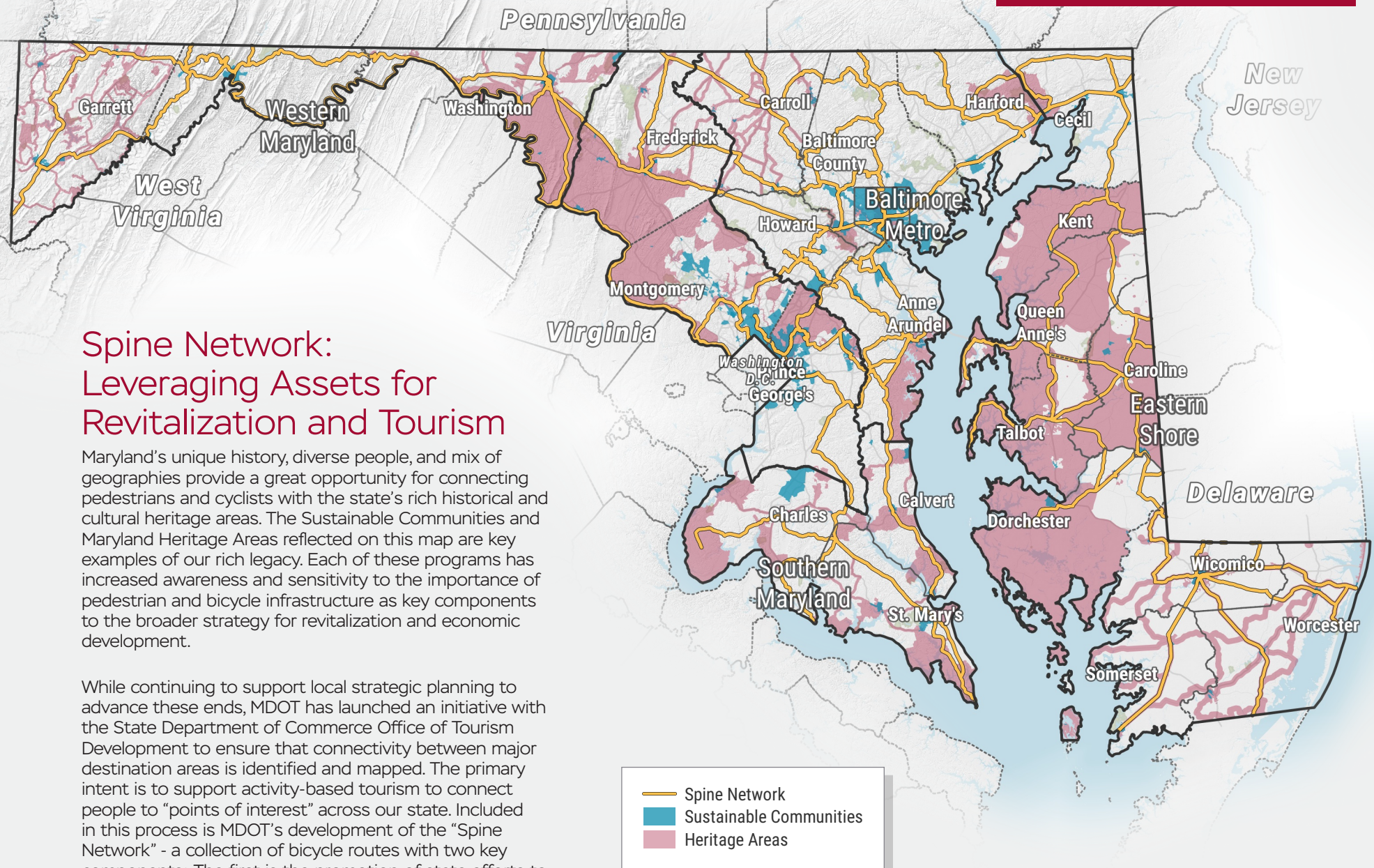
Provide local stakeholders access to reliable data, information, and methodologies for estimating the economic benefits of cycling and walking

Align programs to support enhanced economic impact for communities

Spine Network: Leveraging Assets for Revitalization and Tourism

Maryland's unique history, diverse people, and mix of geographies provide a great opportunity for connecting pedestrians and cyclists with the state's rich historical and cultural heritage areas. The Sustainable Communities and Maryland Heritage Areas reflected on this map are key examples of our rich legacy. Each of these programs has increased awareness and sensitivity to the importance of pedestrian and bicycle infrastructure as key components to the broader strategy for revitalization and economic development.

While continuing to support local strategic planning to advance these ends, MDOT has launched an initiative with the State Department of Commerce Office of Tourism Development to ensure that connectivity between major destination areas is identified and mapped. The primary intent is to support activity-based tourism to connect people to "points of interest" across our state. Included in this process is MDOT's development of the "Spine Network" - a collection of bicycle routes with two key components: The first is the promotion of state efforts to ensure regional connectivity (with accommodation across regions being addressed by emphasizing key corridors). The second involves creating maps and atlases that support the needs of those who seek to explore Maryland by walking or biking.



Conclusion and Next Steps

The Plan's key initiatives are the result of strong cross-agency partnerships. These collaborations are critical as we move forward in achieving the short- and long-term targets. A recurring theme that emerged during the Plan development process was that bicycle and pedestrian access and accessibility are vitally important transportation issues. Many partners and a diverse set of tools are needed to achieve the vision of making Maryland a great place for biking and walking that safely connects people of all ages and abilities to life's opportunities.

The Plan's collaborative process informs complementary planning initiatives being pursued by other state agencies, such as the Maryland Department of Planning, the Department of Natural Resources (DNR), and the Office of Tourism Development. In 2016 and 2017, for example, MDOT coordinated with DNR to host a series of trail workshops. The outcome resulted in an updated list of trail priorities and key "missing links" that make up part of the 2019 DNR Land Preservation and Recreation Plan. Investment in DNR trail systems continues to be a priority for MDOT, as it provides financial support through its numerous funding programs. Additional collaborators, at local and regional levels, are also important contributors in this effort.

A key planning and implementation benefit reflected in this Plan is its strong link to the statewide transportation plan. The MTP serves as a companion document, providing a framework that shares similar strategies and initiatives with the BPMP. It is a guide for all transportation planning and infrastructure initiatives in future years.

In supporting the accountability, efficiency, and continuous improvement of all MDOT programs, the annual Attainment Report will continue to serve as a key touchstone and reporting tool by which progress towards meeting the short- and long-term targets is measured. Along with the Attainment Report, the quarterly MDOT Excelsior performance management system and the state's annual Managing for Results budget also provide additional metrics for monitoring the progress of these initiatives.

The initiatives outlined in the preceding pages also provide new mechanisms to better partner with other entities and communicate with stakeholders. The Maryland Bicycle and Pedestrian Advisory Committee and the relevant subcommittees of Maryland MPOs also present ongoing forums for reporting on, and advancing, interagency initiatives.

Key Initiative Schedule

For more information on these key initiatives, see pages 34-38.

	Short-Term (5 Years)	Long-Term (20 Years)
1	Level of Traffic Stress analysis	Barrier identification and prioritization
	GIS inventory	
	Transit access improvements	
	On-board transit facilities	
2	SHSP implementation	Local context analysis
	Refined analysis tools	
	Statewide Complete Streets policy and Guidelines	
	Health data and analysis	
3	Complete Streets policy for underserved and under invested communities	Local mode share goals
	Amended Bicycle Pedestrian Priority Areas program	
	Streamlined funding	
4	Demonstration projects	Web-based information dashboard
	Network of bicycle and pedestrian counters	
	Safety data	
	Survey strategy	
	Legislative information	
5	Tourism promotion materials	Economic benefits information for local stakeholders
	Statewide economic impact study	
	Active recreation and transportation research and demonstration projects	

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MDOT thanks all who helped in this Plan's development by attending public meetings, participating in surveys, viewing the webinar, or otherwise providing input.

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All photos are by MDOT or consultant staff unless otherwise noted.

Background cover image: Ocean City Boardwalk.
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