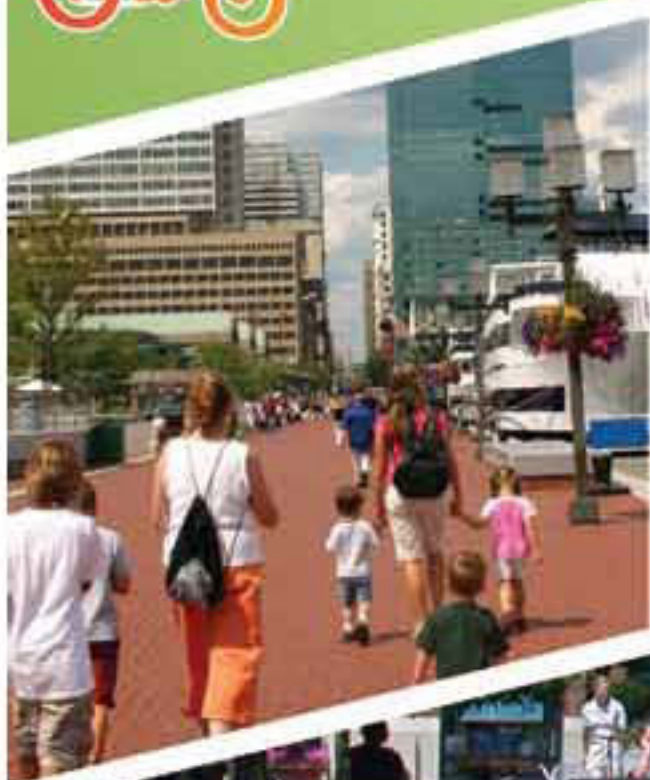
Maryland Department of Transportation

MARYLAND TWENTY-YEAR BICYCLE & PEDESTRIAN MASTER PLAN

JANUARY 2014



Acknowledgments

The Maryland Bicycle & Pedestrian Twenty Year Master Plan is a Maryland Department of Transportation (MDOT) document. It has been prepared by MDOT, in coordination with multiple State agencies, and other community and regional stakeholders.

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1. Introduction

Walking and bicycling are fundamental to life in Maryland. One of the most densely populated states in the country, Maryland is poised to become the best state for walking and bicycling in the nation. The wide-ranging benefits of cycling and walking for transportation can affect all areas of our state: creating more healthy and prosperous communities and reducing congestion and air pollution on Maryland's many crowded roadways. In Maryland's larger urban settings, such as Baltimore City and Ocean City; in urbanizing suburbs, such as Rockville Pike and the US 1 Corridors; in traditional small cities, like Frederick, Annapolis, and Cambridge; and in the State's many historic towns from Westernport and Boonesboro to East New Market and Snow Hill, Marylanders walk and bike to reach jobs, restaurants, shopping, transit hubs, and entertainment. Hundreds of miles of paths and trails along Maryland's shoreline, natural areas and historic rail corridors offer scenic walks and rides for both visitors and residents.

Purpose of the Plan

The Bicycle and Pedestrian Master Plan (Plan) establishes a 20-year vision for making walking and bicycling an integral part of Maryland's transportation system. As established in the Bicycle and Pedestrian Access Act, the Maryland Department of Transportation (MDOT) is required to develop the Bicycle and Pedestrian Master Plan to help systematically direct resources to bicycle and pedestrian projects.[1] In keeping with this statute, development of this Plan proceeded alongside efforts to update the Maryland Transportation Plan, which serves as MDOT's overarching policy document. Updated on a five-year cycle, the 2035 Maryland Transportation Plan (2035 MTP) helps establish the core context in which the bicycle and pedestrian initiatives will be pursued. Developed in close coordination with the 2035 MTP, this Plan focuses on creating a strategic framework to guide MDOT's policies and actions towards a more walkable, bikeable future.

MDOT adopted its first statewide Bicycle and Pedestrian Access Master Plan in 2002. This Plan updates that effort and aims to build on the foundation it established to provide a path forward for advancing bicycling and walking in Maryland.

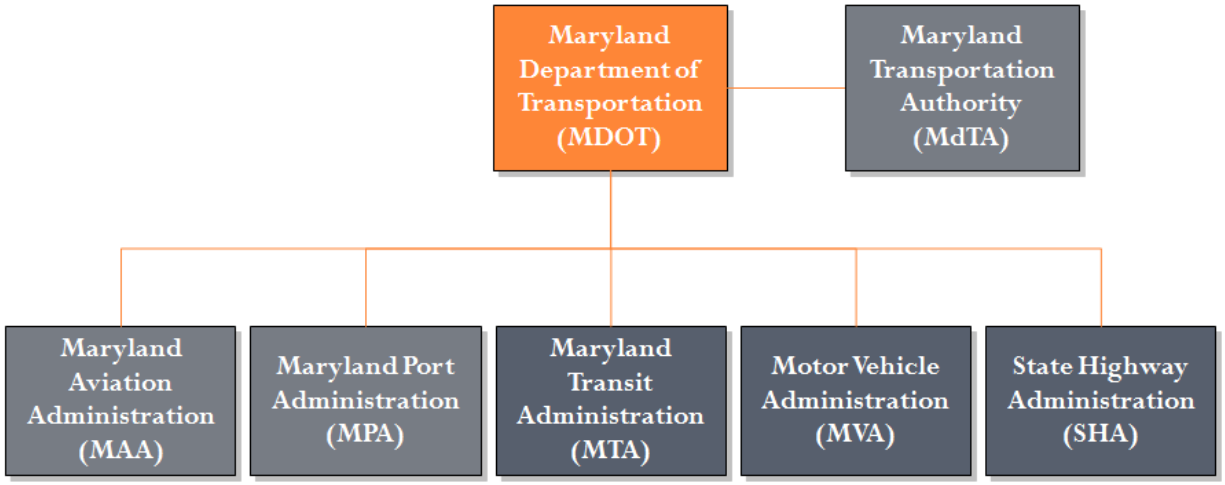
This Plan helps shape MDOT's contribution toward the realization of broader State policy goals and initiatives. Bicycle and pedestrian activities are integrally related to MDOT's collaboration with other state and local agencies on issues of land use, economic development, health and the environment. The Plan initiatives support broader efforts to comply with the State Economic Growth and Resource Protection and Policy Act, as well as other State statutes and initiatives such as the Greenhouse Gas Reduction Act, the statewide land use plan (PlanMaryland), and the Sustainable Communities Act of 2010.

The Plan is particularly focused on helping advance the transportation element of the State's mandated Economic Growth, Resource Protection and Planning Policy. Updated in 2009, this policy reflects the State's continued commitment to develop and implement sound growth and development policies, and highlights the importance of transportation choice in realizing this vision. Accordingly, the 2035 MTP emphasizes a balanced, multimodal and multidisciplinary approach to transportation.

Consistent with MDOT's vision and mission, this Plan seeks to build on recent successes and to help advance a comprehensive, multimodal approach to bicycle and pedestrian improvements. The Plan presents a next step toward implementing the State's recently adopted Complete Streets policy, by outlining strategies to ensure that bicycle and pedestrian needs will be routinely considered as part of all projects, while also maintaining resources devoted to pedestrian and bicycle-specific projects. With coordination and enhanced partnership at

MDOT's mission and vision: "To provide a well-maintained, sustainable and multimodal transportation system that facilitates the safe, convenient, affordable, and efficient movement of people, goods, and services within and between population and business centers"

MDOT Organizational Chart



state, regional, and local levels, the Plan sets out initiatives that can help Maryland realize its potential to become the best state in the nation for walking and biking.

Supporting Walking and Biking

This Plan aims to build upon recent successes and provide a path forward for supporting walking and biking. Much has changed since MDOT adopted its first statewide Bicycle and Pedestrian Master Plan in 2002. MDOT has advanced its policies and programs to support biking and walking; local plans have been adopted and interest has grown; walking and biking are increasingly recognized as desirable community elements to support improved health, quality of life, property values, affordable transportation choices, and tourism; and bike share systems have launched in Maryland. In addition, several bicycle laws have changed. Motorists passing cyclists are now required to give at least 3 feet passing distance. Bicyclists are no longer required to ride within highway shoulders, are no longer required to be equipped with bells, and more Marylanders are choosing to bicycle, walk and use transit to get between home and the activities of daily life. Appendix A provides an overview of Maryland's Bicycle and Pedestrian Laws.

MDOT recognizes bicycle and pedestrian facilities as an integral element of its broader multimodal transportation network. Within MDOT, responsibilities for supporting biking and walking exist across modal administrations, primarily resting with the State Highway Administration (SHA), Maryland Transit Administration (MTA), Motor Vehicle Administration (MVA) and Transportation Secretary's Office (TSO). SHA manages the planning, design, and construction of bicycle and pedestrian facilities along State roadways and administers local grants for bicycle and pedestrian projects. MTA provides transit services and manages access to stations and vehicles. MVA manages driver training and licensing and coordinates with law enforcement. TSO manages department policy planning efforts and coordinates with partner State and local agencies to support consistency,

encourages collaboration between modal administrations and strives to provide coordinated, multimodal solutions that balance the needs of all users.

This Plan also acknowledges, however, that many actors and agencies have major roles to play in realizing the State's potential for bicycle and pedestrian transportation. Commitment to walking and biking by Maryland's local governments is particularly critical, and many are leading the way. While seeking new ways to empower local and regional actors to take action to support walking and biking, MDOT's focus in this Plan is to develop strategies and initiatives that are appropriate and specific to State transportation agencies responsibilities and roles. Without assuming or assigning specific roles on specific projects, the Plan outlines several initiatives that will help strengthen collaboration and promote the productive engagement with key partners.

Benefits of Walking and Bicycling

Interest in walking and bicycling is growing in Maryland as communities across the State realize the benefits associated with having transportation choices. Residents, visitors, businesses and officials are pursuing robust multimodal transportation networks to increase quality of life and community vitality. There is growing awareness of the potential for walking and bicycling, individually or coupled with transit, to reduce auto use, mitigate traffic congestion and contribute to improved air quality. Maryland's Bikeways Program has catalyzed investment in bicycle infrastructure at the local and regional level, and is connecting people and communities across the State with healthy, active and fun transportation choices.

- **Economic Development –** Walkability and trail amenities have been shown to have a strong effect on the value and desirability of housing and neighborhoods. Regional economies can also see positive impact from such infrastructure. The Great Allegheny Passage Trail, for example, is estimated to host over 800,000 trips a year and, in 2008, generated over $40 million in direct annual spending and another $7.5 million in wages, making the trail an important economic generator in the region.[2]

Bicycle and Pedestrian Master Plan Vision and Goals

The Plan's vision statement reflects the input of a wide range of stakeholders, as well as the policy direction provided by State law and the 2035 MTP. The vision statement summarizes the fundamental, long-term objectives for walking and bicycling in the State of Maryland.

Maryland will be a place where bicycling and walking are safe, practical and inviting ways for people of all ages and abilities to complete their everyday travel. Sound policy will enable communities to craft the best solutions to their unique mobility and access challenges, and to reap the social, economic, health and environmental benefits of expanded transportation choices. Smart prioritization and creative collaboration will ensure wise and effective use of all State resources.

- ***Goal 1. Build Connected Networks***
  Expand walking and bicycling networks, remove barriers, and enhance connections with transit and travel destinations.
- ***Goal 2. Improve Safety***
  Enhance pedestrian and bicycle safety to reduce injuries and fatalities and to make walking and biking comfortable and inviting.
- ***Goal 3. Plan and Design for Everyone***
  Effectively balance the needs of all transportation users to promote travel choices, ensuring that bicyclists and pedestrian needs are prioritized in appropriate locations.
- ***Goal 4. Strengthen Communities***
  Partner with local governments to support walkable and bikeable communities to achieve sustainability, livability, health, and economic benefits.
- ***Goal 5. Promote Walking and Biking in Maryland***
  Support walking and biking as everyday modes of transportation and recreation and vital elements of a livable community through encouragement, marketing, and information.

- **Promoting Choice and Alternatives –** Increasingly, people are living car-free or car-light, reducing their use of personal autos and instead walking, biking and using transit. This is a personal choice for many, but is obligatory for a growing number of people including children, seniors, people with disabilities, and those who may not be able to afford the cost of owning a car. Investments in walking and bicycling infrastructure and programs supports personal choice and creates a transportation system that serves the needs of all users.
- **Public Health –** The Center for Disease Control estimates that almost 70% of US adults suffer from being overweight or obese. Walking and biking are increasingly recognized as important and effective solutions to the lack of sufficient physical activity and exercise. A safe and connected walking and bicycling network allows people to make some or all of their trips active parts of their day, improving individual health with a potential to positively impact broader community health outcomes and reduce ever-escalating public health costs.
- **Strong Return on Investment –** Investments in walking and bicycling infrastructure are relatively low cost, but can have positive impacts on local and regional economies. A study of investments in Baltimore's bicycling infrastructure found significantly higher job creation per dollar spent when compared to traditional highway projects. Furthermore, bicycle and pedestrian facilities can often be incorporated into larger roadway projects in a very cost-effective manner.
- **Environmental Benefits –** Replacing even a small percentage of local automobile trips with walking and bicycling can have significant benefits, including reduced auto emissions and a reduced auto traffic growth rate. A slower traffic growth rate can in turn reduce pressure to build more travel lanes and increase intersection size. Managing the growth of the State's transportation infrastructure footprint can reduce impervious cover, improving water quality and enhancing Maryland's water resources including the Chesapeake Bay.
- **Community Vitality –** There is increasing awareness by elected officials across Maryland that successful and attractive communities will be those that effectively respond to changing interests and priorities. Studies by organizations such as the National Association of Realtors are revealing that people seek communities that provide high quality transportation choices and that people will pay a premium to live and work in walkable and bikeable environments. Furthermore, greater numbers of people walking and bicycling can strengthen neighborhoods and reduce crime by increasing the number of eyes on the street.

2. Plan Development Process

The planning process for this Master Plan began with an assessment of current conditions for biking and walking in Maryland, including a review of progress on implementation of the 2002 Maryland Bicycle and Pedestrian Master Plan. This assessment and ongoing dialogue with stakeholders throughout the planning process helped identify key issues, challenges and opportunities that were then organized into the goals, objectives, and strategies described in the following chapter.

Current Conditions

A general assessment was conducted of the quality of the State bicycle and pedestrian networks in Maryland by gathering data on bicycle and pedestrian travel, roadway characteristics, police-reported crash data and MDOT policies and practices governing bicycle and pedestrian investments. This section of the Master Plan describes key findings. The complete assessment is provided as Appendix B of this Plan.

Pedestrian and Bicycle Travel

The levels of walk and bike commuting have remained relatively stable over the last decade, though the mode shares are still relatively small. Statewide, the total number of Marylanders walking to work increased by about 2,000 between 2000 and 2012; however, the rate of walk commuting decreased from approximately 2.59% to 2.43% over the same period. Between 2000 and 2012, the rate of biking to work increased from approximately 0.19% to 0.28%.[3] These figures rank Maryland 32nd and 39th in the United States based on the share of workers walking and bicycling to work, respectively.[4] Data about the amount of bicycling and walking for purposes other than commuting to work, such as running errands, visiting friends, or traveling to school are limited and no statewide data are available. Generally, research shows that bicycle and pedestrian modes are used more often for non-work related travel because these types of trips tend to be shorter.

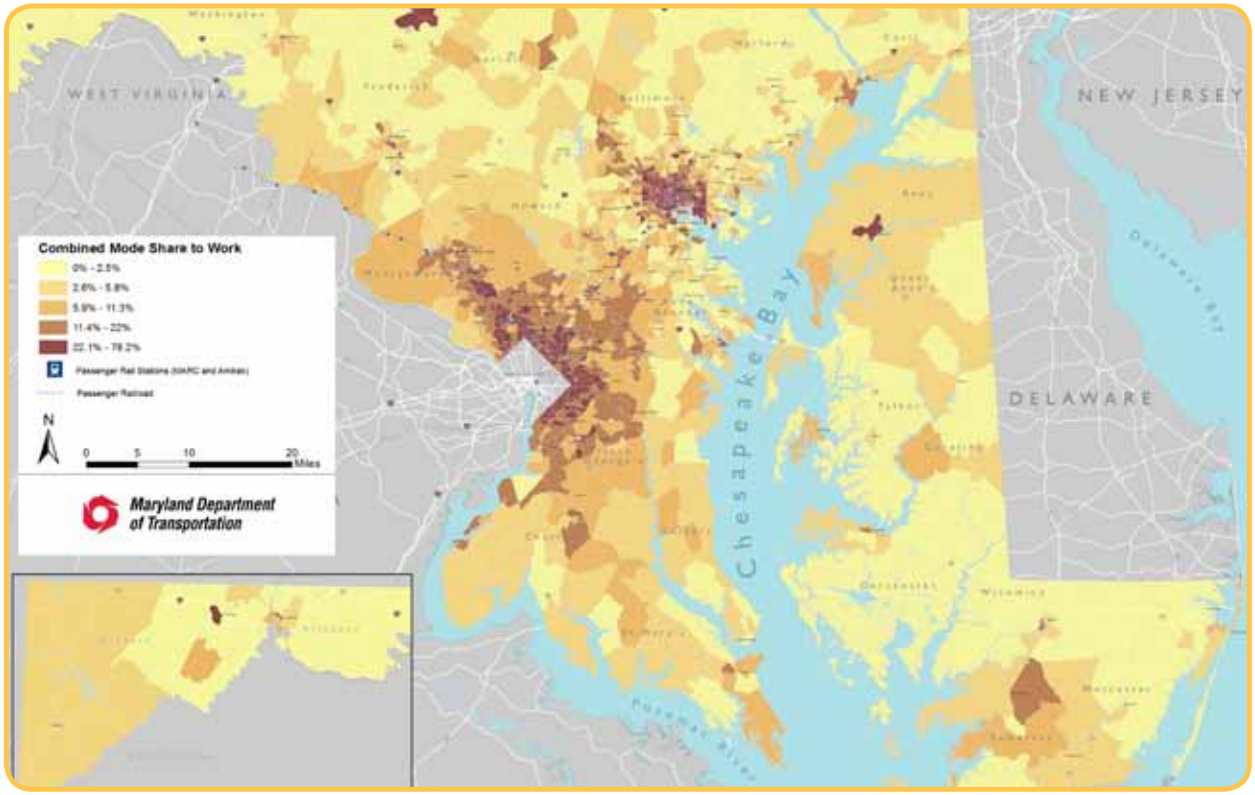
Transit use is an important indicator of walking and biking in Maryland because transit is often accessed by walking and or bicycling. It is reasonable to assume that most

Key Accomplishments

The Maryland Bicycle and Pedestrian Access Master Plan of 2002 (2002 Plan) responded to increased public interest in walking and bicycling, as well as the State's "Smart Growth" goals, by engaging multiple public and community stakeholders to create a comprehensive guidance document for efforts to increase bicycle and pedestrian mobility. Some of the key accomplishments and ongoing activities since the 2002 Plan include:

- Equipped most Maryland transit buses with bike racks.
- Completed statewide ADA compliance assessment, provided ADA training to State and local staff, and implemented ADA retrofit program.
- Created a Maryland Strategic Trails Plan.
- Established Safe Routes to School and Maryland Bikeways grant funding programs.
- Launched Cycle Maryland to promote cycling opportunities and awareness.
- Adopted an SHA Complete Streets Policy.
- Created regional safety coordinator positions and SHA Pedestrian Safety team.
- Implemented policies to ensure routine accommodation of bicycles along State roads.
- Developed SHA Bicycle and Pedestrian Design Guidelines.
- Supported annual Street Smart campaign and developed safety and awareness materials.
- Completed several key projects including the Great Allegheny Passage trail, Woodrow Wilson Bridge shared use path, and Sister City Friendship bridge across I-270.
- Initiated designation of US Bicycle Route 50 along the Great Allegheny Passage and C&O Canal towpath (GAPCO) corridor.
- Created and distributed improved bicycle safety materials such as the *Safe Bicycling in Maryland* booklet.

Bicycle, Pedestrian and Transit Mode Share to Work



transit trips are accompanied by at least one walk or bicycle access trip. Statewide, nearly 9 percent of Maryland commuters travel to work using transit.

Combined bicycle, pedestrian and transit mode share tends to be highest in urban centers and around colleges and universities. The mix, density and design of land uses, as well as households without access to a private vehicle and many other factors influence walking, biking and transit use.

Existing Facilities

Bicycle Facilities

Bicycle facilities along State roads include marked bike lanes, sidepaths, paved shoulders and shared lanes denoted with the use of pavement markings. SHA issued a Policy on Marked Bicycle Lanes in June 2011 and subsequently developed the SHA Bicycle Policy and Design Guidelines in June 2013 to guide an increase in the development of bicycle facilities on or along State roads. The policy requires the review of bicycle accommodation as part of every SHA project, including road resurfacing, and directs staff to make every effort to narrow travel lanes in order to provide bicycle lanes or, if there is not sufficient width for bicycle lanes, for a widened shoulder to improve bicycle compatibility. Additionally, the SHA bike policy calls for replacement of storm drain grates with grates that are bike friendly.

MDOT uses the Bicycle Level of Comfort (BLOC) methodology to assess bicycle conditions on state roadways. BLOC is a nationally-recognized methodology to assess conditions by assigning roadway segments a letter grade based on the following roadway characteristics: outside travel lane width, shoulder or bike lane width, speed limit, traffic volume, truck volume, pavement condition and presence of on-street parking.

"Cities with 10 percent more bike lanes or paths have about 2 percent to 3 percent more daily bicycle commuters."

How to Increase Bicycling for Daily Travel

2035 Maryland Transportation Plan Regions

State Road Bicycle Level of Comfort by Region

Regions	Bicycle Lane Miles*	Average BLOC	BLOC					
			A	B	C	D	E	F
Western Maryland	5	B	46.3%	17.8%	15.0%	12.5%	6.5%	1.9%
Washington Metro	20	D	22.3%	4.5%	11.1%	21.2%	29.6%	11.3%
Baltimore Metro	9.1	C	28.2%	8.0%	12.3%	21.5%	20.9%	9.0%
Southern Maryland	9.7	C	35.8%	13.2%	11.7%	25.9%	8.1%	5.2%
Eastern Shore	14.1	B	43.0%	20.3%	16.8%	12.2%	4.8%	3.0%
Maryland	57.9	C	34.6%	12.9%	13.7%	18.0%	14.5%	6.3%

*As of July 1, 2012 on State-owned roadways

This methodology has allowed the State to assess existing bicycle conditions and to compare roads to each other using a set of consistent factors statewide. SHA works to achieve a level of D or better for at least 80% of eligible State roadways.[5] As of 2013, 79% of State roadways had reached this threshold. In 2013, approximately 9 miles of bike lanes were added to state roads, bringing the statewide total from 57.9 to 67 miles. All MTA core service buses are equipped with bike racks.

The most difficult conditions for bicycling (BLOC E-F) typically occur along urban roadways in part due to high traffic volumes. BLOC scores for rural roadways are

Sidewalks on State Roads by Region

	Miles of Sidewalk along State Roadways	Percent of Sidewalks Compliant with ADA	Percent of Urban State Roads with Sidewalk
Western Maryland	43.73	56.07%	5.50%
Washington Metro	400.36	63.38%	30.97%
Baltimore Metro	226.8	61.68%	14.90%
Southern Maryland	36.59	58.45%	13.70%
Eastern Shore	114.11	62.14%	14.11%
Maryland	821.57	63.24%	21.10%

*As of December 2012

considerably better than for urban roadways, although some State roadways serving as major connectors within rural areas, such as US 40 in Frederick county and US 50 south of Queenstown on the Eastern Shore, also have low BLOC scores.

Many stakeholders mentioned that even isolated obstacles along popular bicycle routes can disrupt the connectivity of the network and cause significant detours and safety concerns. In response, this Plan includes goals and objectives that focus on providing network connectivity, creating key links, and closing gaps in the bicycle and pedestrian network.

Pedestrian Facilities

The majority of sidewalks on State roadways are located in urban areas or commercial areas along rural roads (e.g. main streets in rural towns). Approximately 821 miles of sidewalks currently exist along State roadways. Approximately 21% of directional miles of eligible State roadways in urban areas currently have sidewalks. SHA's performance target is to increase sidewalk mileage along State roads by 2%, or about 17 miles of new sidewalk, each year. A range of factors affect whether a State road has a sidewalk along it today. These factors include location within a Priority Funding Area,[6] available right-of-way, the willingness of local government or adjacent property owners to agree to maintain a sidewalk, the type of terrain and physical features, the nature of adjacent development, and local regulations related to sidewalks. Under State law, local municipalities are responsible for maintenance and repair of sidewalks along State roads. In some communities, local laws transfer maintenance responsibility to adjacent property owners. SHA supports reconstruction of sidewalks that have deteriorated to the extent that repair is not practical or that require upgrade to comply with the Americans with Disabilities Act (ADA).

Great progress has been made in recent years in upgrading sidewalks along State roadways to comply with the Americans with Disabilities Act (ADA) Accessibility Guidelines. SHA and MTA have been proactively reconstructing sidewalks, crossings, and transit facilities that were built before ADA, to comply with the law. SHA has adopted an accessibility policy that exceeds federal

requirements and is currently working on updating guidelines to provide additional design guidance including best practices. ADA regulations do not require roads without sidewalks to be accessible. As of December 2012, 63% of sidewalks; 33.5% of curb ramps; 59.1% of bus stops; 36.8% of driveway crossings; and 69.1% of medians along State roads were ADA compliant. SHA is continually making ADA related improvements to meet its goal of full compliance on all sidewalks along State roadways.

Objectives and strategies in this Plan include initiatives to provide assistance to local governments in connecting State and local pedestrian facility networks and reinforce best practices to increase development of sidewalks along State roadways.

Transportation Trails

The 2009 Statewide Trails Plan identified approximately 780 miles of transportation trail facilities throughout the State. These transportation trails, or shared-use paths, are designed to be a part of a transportation system, providing off-road routes for a variety of users. Approximately 515 miles (66%) are located within urbanized and suburban areas between Washington, D.C. and Baltimore City. Major trails, such as the C&O Canal Trail, the Anacostia Tributary Trails and the Capital Crescent Trail are important pathways for biking and walking in Maryland. Shared-use paths offer important alternatives to higher speed roadways that stakeholders reported were very important to encouraging broader participation in walking and biking.

Maryland also has extensive networks of recreational trails, which MDOT supports through the National Recreational Trails program. Recreational trails are largely designed for pedestrians and other users for outdoor recreational purposes, and may not be designed with a transportation focus.

Shared-use paths and trails are important assets in rural areas, where economic development associated with bicycle tourism can be significant. For example, a 2008 study measuring the impact of the Great Allegheny Passage on local economies estimated that on average one-quarter (25.5%) of the revenue businesses received in 2007, was attributed to the existence of the area's biking/hiking trail.[7]

Safety

Pedestrian and bicycle safety are key focus areas for MDOT and its modal administrations. The 2011 Maryland Strategic State Highway Safety Plan and Business Plan include goals to reduce the number of pedestrian injuries and fatalities. The number of bicycle and pedestrian crashes have steadily decreased throughout Maryland;[8] however, the number of crashes remains a cause for concern. While the pedestrian involved crashes decreased 19 percent from 2006 to 2011, the number of pedestrian fatalities increased by 9 percent.[9] In 2010, pedestrian fatalities per capita in Maryland were 27% higher than the national average.[10]

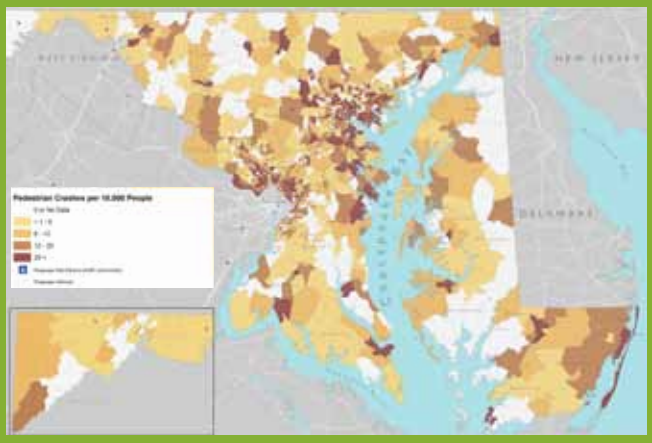
Pedestrian and bicycle crash data were reviewed to identify the geographic distribution of pedestrian crashes throughout the State. The majority of bicycle and pedestrian crashes occurred in the most densely populated parts of the State, both in the metropolitan areas and smaller towns and cities. From 2006 through 2011, the number of bicycle related crashes decreased by 16%, with the highest level of crashes occurring in suburban areas surrounding Washington, D.C. and Baltimore City, particularly in Anne Arundel, Baltimore and Prince George's counties.[11] Ocean City also experienced a significant number of crashes during the same period.

Maryland's highway safety program includes a comprehensive pedestrian and bicycle safety program that promotes safe pedestrian and bicycle practices, educates drivers to share the road safely with other road users, and encourages safe facilities for pedestrians and bicyclists through a combination of education and engineering strategies. MDOT has undertaken several

initiatives to work toward improving pedestrian and bicyclist safety including:

- Launched the StreetSmart campaign that reached millions of people in the Baltimore and Washington, D.C. metropolitan areas with pedestrian safety messages directed at both motorists and pedestrians through radio, television and outdoor advertising. Law enforcement activities were also increased to reinforce the campaign.
- Supported BikeMaryland's launch of the Bicycle Ambassadors program, targeting outreach to over 1,000 young bicyclists in and around Baltimore City. BikeMaryland established a partnership with Port Discovery in downtown Baltimore to reach at-risk Baltimore City school children by participating in Port Discovery's youth education program.
- Supported the Washington Area Bicyclists Association's (WABA) Maryland Pedestrian and Bicycle Safety Education Program to educate

Statewide Pedestrian Crashes 2006-2011

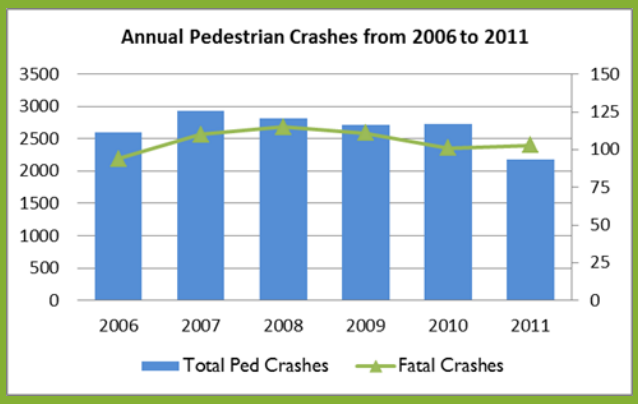


Statewide Bicycle Crashes 2006-2011

Pedestrian and bicycle crash data from Maryland Automated Accident Reporting System (MAARS) was provided by the State Highway Administration (SHA). The data were compiled from crash reports developed by more than 200 Maryland law enforcement agencies. Crashes have not been verified on a site specific basis. Census tracts shown in white represent areas of the State where either: a) no pedestrian crashes happened during the analysis period, or b) crashes occurring in those locations were not coded with data that enable crashes to be mapped.

The crash data represented for the City of Baltimore only incudes information for the period between 2009 through 2011.

Source: Maryland Automated Accident Reporting System (MAARS). Data only includes crashes documented in Police Reports.



Pedestrian- and Bicycle-Friendly Zoning Regulations

The City of Laurel adopted a Unified Land Development Code in July 2011 to consolidate its zoning, subdivision, forest conservation, and other development-related regulations. Through this process, the City added specific requirements for accommodating pedestrians and bicyclists in all new developments. These changes are intended to provide Laurel residents and visitors alternate choices for getting around town.

- **Traffic Impact Studies -** requires developers to evaluate conditions for bicycle and pedestrian trips generated to and from a proposed development, rather than only auto trips.
- **Driveways -** reduces and/or consolidates the number of driveways in redevelopment projects, thereby reducing conflict points for autos, bicycles, and pedestrians.
- **Block Length -** limits block length to 500 feet (down from 1,400 feet) to improve walkability and reduce out-of-direction travel.
- **Dead-end Streets -** prohibits dead-end and cul-de-sac street development to improve multimodal connectivity.
- **Multimodal Evaluation Procedures -** requires minor streets be designed to limit speeds using tight corner radii, narrower lane and roadway widths, and curb extensions.
- **Bicycle Parking -** requires new multi-family, office, and commercial developments to provide bicycle parking.
- **Sidewalks -** requires sidewalks on both sides of all primary and secondary residential streets (previously required on only one side); establishes minimum sidewalk width of 6 feet.

These updates to Laurel's code are designed to improve safety and convenience for walking and bicycling, while supporting the City's economic development goals, which recognize the connection between walking and vibrant Main Street shopping districts.

children on basic pedestrian safety issues and bicycle operation skills.

- Developed a process to prioritize high-pedestrian-incident locations.
- Created partnerships among state, regional and local stakeholders to develop action plans that address high-priority locations.
- Worked with partners to distribute more than 200,000 pieces of educational material, including StreetSmart-branded materials, pedestrian safety law cards, booklets for school aged children, and other materials.
- Created a pedestrian safety team and established Regional Traffic Safety Program coordinator positions to ensure continual focus and coordination with local jurisdictions on pedestrian safety issues.
- Initiated and distributed safety materials including the Safe Bicycling in Maryland brochure, Competence and Confidence adult bicycle safety video, and The Role of Law Enforcement in Bicycle Safety police training video.

Stakeholders emphasized the importance of continuing education for pedestrians, cyclists and drivers about Maryland law and safe practices. Some stakeholders also discussed the importance of facility design, traffic speeds and maintenance issues in pedestrian and bicyclist safety. Plan strategies address each of these topics.

Land Use and Community Design

The variety of land use patterns and community characteristics across Maryland influence the demand and opportunity for biking and walking. Certain land uses, such as transit and commercial centers, schools and parks, are particularly important generators of bicycle and pedestrian trips. While urban areas tend to have the highest levels of walking and biking, bike and walk activity and opportunities also exist in suburban and rural areas.

Bicycling and walking travel depend on the availability of safe, comfortable road and trail facilities as well as community design that bring travel destinations close together so that biking and walking are practical options.[12] Much of the walking and bicycling throughout

the State tend to occur in geographic locations with varied land uses and a concentration of activities. Other elements of community design, such as urban design, public safety and land use mix also play important roles in supporting bicycle and pedestrian travel.

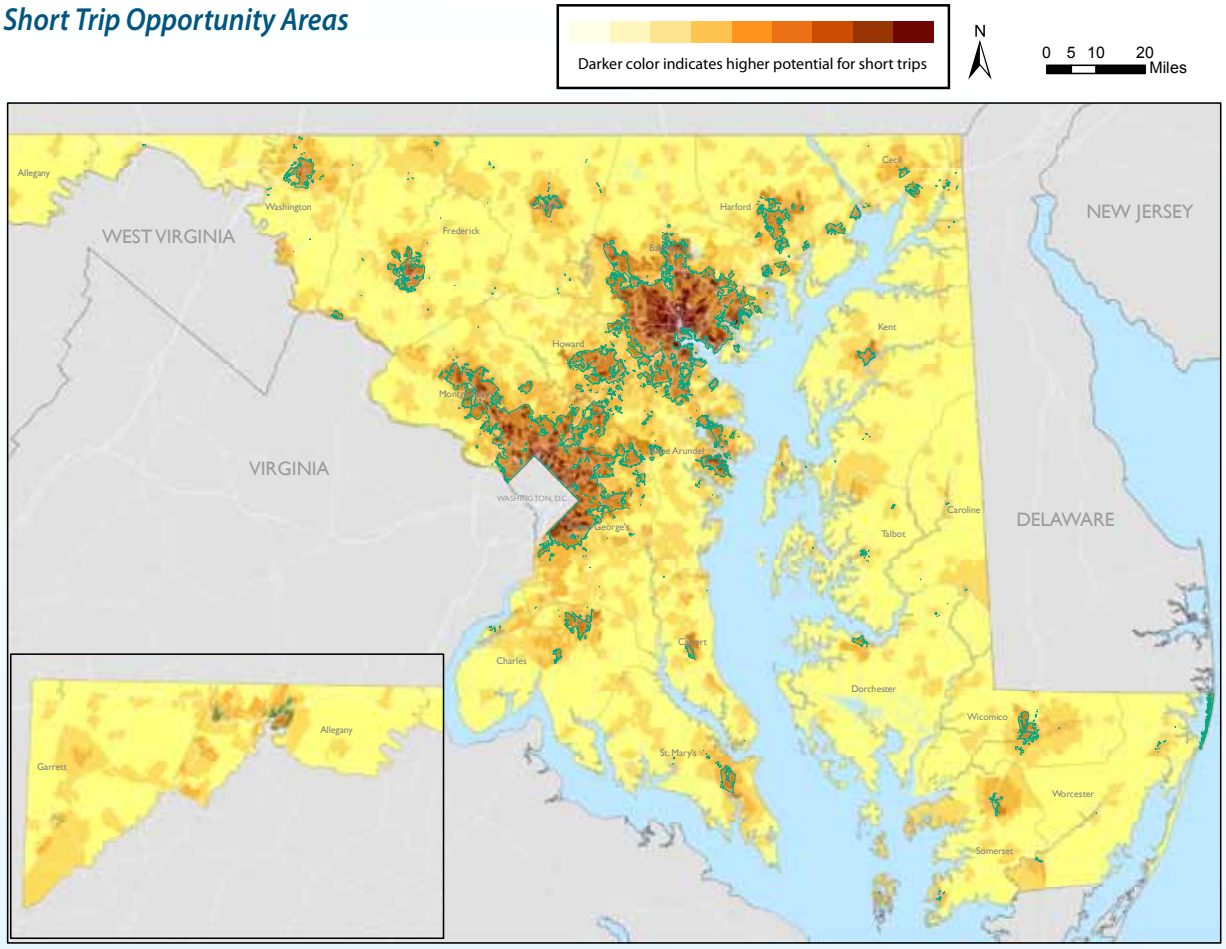
Automobile-centric land use patterns, typical of mid and late-20th century development pose major challenges to promoting bicycling and walking. Many work trips are simply too far for travel by biking or walking alone. Fortunately new mixed-use and transit-oriented development plans are beginning to emerge, thus providing new opportunities for increasing walking, bicycling and transit activity while reducing dependence on auto travel.

In addition, four Maryland communities – Baltimore, Bethesda, Frederick and Rockville – have been recognized by the League of American Bicyclists as Bicycle Friendly Communities.

Sixteen Maryland businesses and the University of Maryland have also secured Bicycle Friendly designations. These awards recognize communities, businesses and universities that have made significant efforts to encourage bicycling.

Stakeholders providing input on this Plan often emphasized the importance of recognizing and responding appropriately to the different types of biking and walking activity in communities across the State. Longer distance road cycling and walking within historic town centers are the primary walking and biking activities in rural areas, while short-distance utilitarian walking and cycling are much more common in urban areas.

Short Trip Opportunity Areas



80% of pedestrian and bicycle crashes reported between 2006 and 2011 occurred in the darkest areas of the map, identified by the green border.

The Short Trip Opportunity Areas map shows an analysis of existing land uses across Maryland. The darker areas of the map indicate places with high potential for short trips that could be accomplished by walking or biking. The analysis shows the range in the combined density of households, jobs, schools and transit stops. It also includes the density of households without access to a vehicle, since these households must accomplish their daily needs using other transportation modes. Each of these factors is a good predictor of bicycle and pedestrian demand.

The darkest areas highlighted within the green outlined area in the map comprise approximately 8% of the State. Over 80% of Maryland's bicycle and pedestrian crashes reported between 2006 and 2011 occurred within these areas. This is a high-level land use analysis; the local context, roadway users, and multimodal potential need to be evaluated on a project specific basis to understand the pedestrian and bicycle travel needs. However, the areas identified within the green border are closely correlated to pedestrian and bicycle safety and indicate areas with high potential for walking and biking as daily travel modes. These areas present a focal point for identifying pedestrian and bicycle priorities.

Short Trip Opportunity Criteria

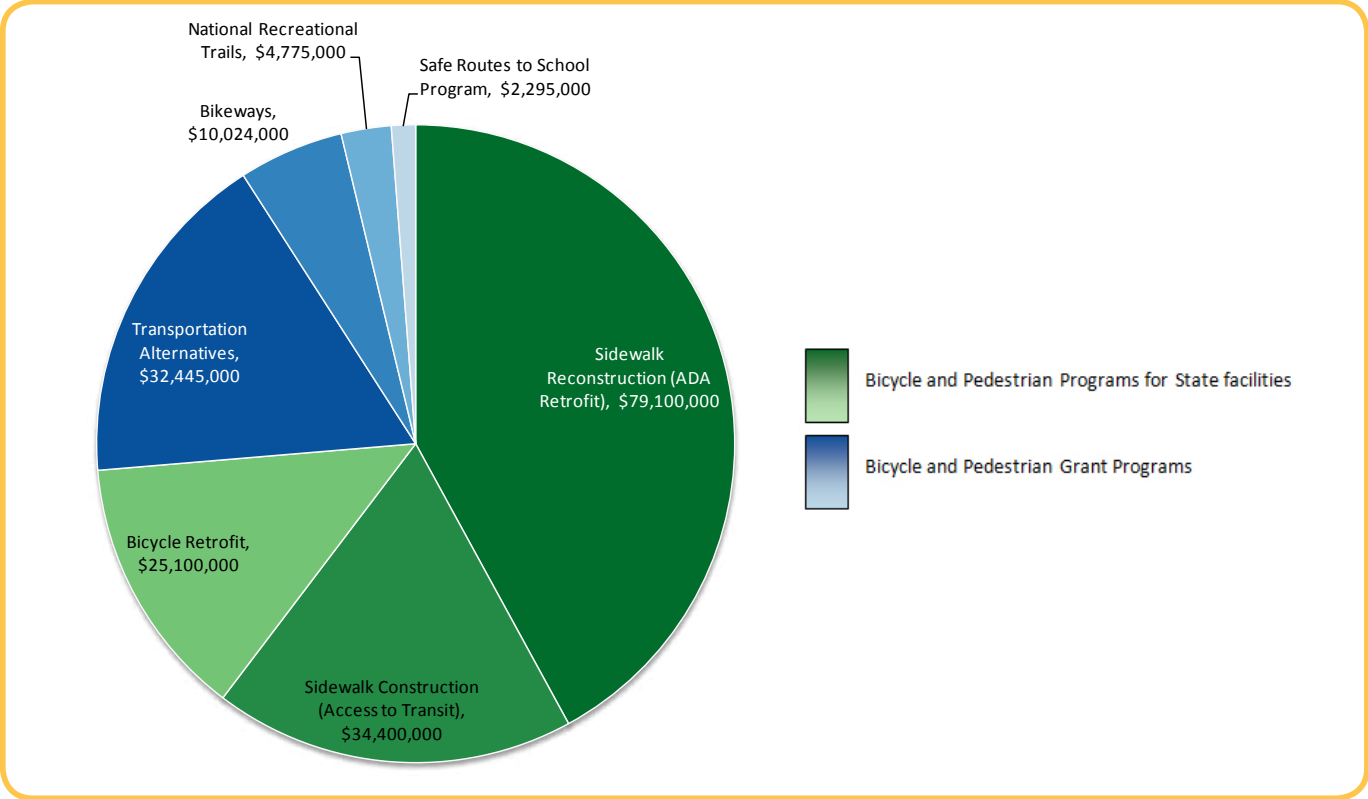
Criteria	Weight	Notes
Population Density	25%	Higher population densities are directly related to increased levels of walking and bicycling due to reducing the distance between origins and destinations.
Employment Density	25%	Jobs are a major driver of travel, and can help predict the amount of freight and vehicle commuting that must share the network with pedestrians and bicyclists. Higher job density provides concentrations of opportunities for people to walk or bike commute.
Proximity to Bus and Passenger Rail Stations	10%	Walking and biking are the most common ways to access transit.
Percent of Households with No Motor Vehicle Access	20%	Households without access to a private vehicle depend on walking, biking, and transit for travel.
Proximity to Primary, Secondary and Post-Secondary Schools	20%	Schools, colleges and universities are major trip generators and college campuses have high rates of walking and bicycling.

Bicycle and Pedestrian Funding

MDOT invested more than $283 million in non-motorized transportation projects to improve bicycling and walking conditions over the last decade. Additional bicycle and pedestrian related improvements funded through broader programs may not be captured in this total. These investments have included updated bicycle and pedestrian facilities for new roadways, retrofitting roads with bicycle and pedestrian facilities, improving crossings, and enhancing bicycle and pedestrian connections to transit. The proportion of total highway expenditures dedicated to bicycle or pedestrian programs increased from 2% to 4% over the last decade. MDOT coordinates with local jurisdictions and sister agencies to support cycling and walking as a part of broader efforts to reach economic, environmental and quality of life goals.

In addition to investing through programs specifically designated for bicycle and pedestrian improvements, MDOT also funds bicycle and pedestrian improvements as an integral part of broader transportation projects. Integrating bicycle and pedestrian elements fully into all projects, consistent with Complete Streets policies, is critical for developing an integrated multi-modal transportation system, and often results in more efficient use of resources. For example, under SHA's bicycle policy, marked bike lanes will be striped wherever possible during resurfacing maintenance projects. Additionally, as part of MTA station improvement projects, improved bicycle amenities and upgrades to make stations ADA compliant are included. Also, the Maryland Highway Safety Office awards grants to support safety and education programs and projects that include key bicycle and pedestrian

MDOT Bicycle and Pedestrian Program Funding Levels (2014-2019)



efforts. While these examples are often not itemized as bicycle and pedestrian investments, they represent important contributions for implementing this Plan.

A large proportion of available funding for bicycle and pedestrian projects, is guided by the current federal authorization for transportation, entitled, Moving Ahead for Progress in the 21st Century (MAP-21). Passed in 2012, MAP-21 reorganized several federal funding programs, and consolidated previously separate sources, such as Safe Routes to Schools, under the broader umbrella now known as Transportation Alternatives. In addition to these sources, however, MDOT also directs funding towards bicycle and pedestrian infrastructure, from the State's Transportation Trust Fund.

In recent years, approximately 75% of MDOT's bicycle and pedestrian investments have funded projects that are managed directly by MDOT modal administrations for improvements to State roads and transit facilities, while about 25% has been provided as grants to local jurisdictions and partners to support local bicycle and pedestrian projects and programs. MDOT has budgeted nearly $210 million for bicycle and pedestrian related projects between 2014 and 2019. Of this funding, approximately $50 million will be provided in grants, $139 million will support improvements to State facilities through bicycle and pedestrian programs, and an estimated $21 million will support bicycle and pedestrian improvements to State facilities through broader funding programs.

Current MDOT-administered reimbursable grant programs that support local bicycle and pedestrian projects are listed below. Most programs solicit applications for funding annually. Further program information can be found on MDOT modal administration websites.

- **Transportation Alternatives** – SHA administers the federal Transportation Alternatives Program to fund projects that enhance the cultural, aesthetic, historic, and environmental aspects of the intermodal transportation system. MAP-21 reshaped the Transportation

Enhancements Program into the Transportation Alternatives Program, making the Safe Routes to School Program part of the Transportation Alternatives Program and giving regional planning organizations some authority to select projects for funding. Funding for the Transportation Alternatives Program is set by the federal surface transportation authorization, which currently directs approximately $11 million annually statewide. There is no dedicated funding for Safe Routes to Schools projects, but these projects are eligible for funding under the Transportation Alternatives Program.

Example Project: Over $1.4 million is allotted for The Three Notch Trail along the St. Mary's County railroad right-of-way. The completed trail will connect the Charlotte Hall Library, the St. Mary's County Farmers' Market, the Charlotte Hall Veterans Home and links the villages of New Market and Charlotte Hall.

- **National Recreational Trails** – An ongoing federal transportation program administered by SHA that funds construction and maintenance of recreational trail facilities in communities across Maryland. The current federal transportation authorization sets aside about $1 million per year for this program.

  Example Project: The Catonsville Rails to Trails group was recently awarded $30,000 to build a walking and bicycling trail along the former Short Line Railroad route connecting the center of Catonsville with Charlestown Retirement Center.

- **Maryland Bikeways Program** – A state-funded program administered by MDOT, the Maryland Bikeways Program provides grants for technical assistance to a wide range of bicycle network improvements. The program launched in 2011 and invests approximately $3 million per year.

  Example Project: The Maryland Bikeways Program partially funded over two miles of on-road bikeways that improved bicycle network connections in downtown Salisbury, MD.

- **Maryland Bikeshare Program** – The Maryland Bikeshare Program provides grants to communities interested in adding a bikeshare system.

  Example Project: In FY 2013, $1,008,000 was awarded for implementing a bikeshare program in Montgomery County which opened in September 2013.

Funding for bicycle and pedestrian improvements to State roads and transit facilities is currently provided through the following programs. Projects are identified and prioritized for funding under these programs based on a number of factors including safety record, proximity to transit, staff recommendations, citizen and elected official requests, and requests included in annual priority letters submitted to MDOT by local jurisdictions.

- **Sidewalk Construction** – SHA will invest $34.4 million over the next six years in sidewalk construction along state roads to improve mobility, reduce public safety risks, and remove barriers to easy movement of citizens. Projects are generally conducted at the request of local government, but may also be a response to high incidents of pedestrian-related crashes. Projects improving access to transit are prioritized.

  Example Project: SHA is constructing a new sidewalk on Wisconsin Avenue (MD 355) in Montgomery County to improve safety and comfort. The project also includes landscape improvements and construction of two retaining walls.

- **Sidewalk Reconstruction** – Sidewalk reconstruction projects are intended to upgrade pedestrian facilities to meet the Americans with Disabilities Act (ADA) guidelines and SHA's Accessibility Policy. SHA has programmed approximately $79.1 million over the next six years toward this program, which funds reconstruction of existing sidewalks along state roads to bring them into compliance with federal guidelines. Projects within ½-mile of transit stops, schools, hospitals, libraries, government facilities, and senior centers and in areas with high pedestrian crash history are prioritized.

  Example Project: SHA recently upgraded the sidewalks on Old Georgetown Road in Bethesda to address issues with narrow widths, cracks, steep cross slopes, ADA ramps, and inaccessible bus stops.

- **Bicycle Retrofit –** SHA funds small-scale improvements on state roads to improve bicycling conditions, targeted toward projects that can be completed quickly and without the need for permits or right-of-way acquisition.

  Example Project: SHA will begin construction in 2014 on over $1,500,000 in on-road bicycling improvements on MD 170 from MD 648 to Andover Road in Anne Arundel County. This project will provide marked bicycle lanes and shared lane signing throughout the project limits.

- **Community Safety and Enhancements –** SHA leads design and reconstruction of state roadways, particularly in Main Street contexts, to better integrate pedestrian- and bicycle-friendly street design, transit shelters, lighting, and other street amenities and to address drainage problems to provide a safer and more welcoming environment for all State highway users. SHA plans to invest over $134 million in this program over the next six years.

  Example Project: SHA is currently planning and designing pedestrian, roadway and drainage improvements on MD 144 (Main Street) in Historic New Market in Frederick County. This project will improve the quality of life for the residents of New Market, while improving safety along Main Street and its sidewalks for the many visitors who come to this historic town each year.

Public Involvement

Public involvement was an important part of the planning process for this Master Plan. Public input helped identify important issues and shape the priorities and direction of the Plan. A wide range of stakeholders provided input and direction on priorities, challenges, opportunities and experiences regarding walking and biking in Maryland. Specific groups engaged include cycling and walking advocates, State agencies, local governments, elected officials, public health officials, as well as public citizens. Outreach occurred statewide, with input from stakeholders in all regions. Below is an overview of key messages and specific strategies used to gather input from a wide variety of people with an interest in bicycle and pedestrian issues in Maryland. Detailed results of the public input process are available in Appendix C.

Listening to Stakeholders and Citizens

The public input process provided a wealth of useful information and dialogue about improving biking and walking in Maryland. Key messages communicated consistently included:

- Confirmed importance of biking and walking as a daily activity.
- Need for approaches to biking and walking improvements that are appropriate for their community context and the biking and walking opportunities that exist there.
- Gaps and barriers limit the usefulness of current facilities.
- Desire for the State to provide leadership and assistance to local governments to promote walking and biking.
- Make walking and biking comfortable and convenient to increase activity.
- Provide facilities that will appeal to more people.
- Pursue innovative approaches in more urban areas and corridors, where bicycle and pedestrian safety and comfort should be high priorities.
- Continue education, awareness, enforcement and engineering changes to improve safety.

Advisory Group

MDOT formed an Advisory Group for the planning process comprising bicycle and pedestrian advocates, local government representatives and other State agency representatives. Several members of the Maryland Bicycle and Pedestrian Advisory Committee (MBPAC), a group appointed by the Governor to advise on a wide range of

User Survey Results Highlights

- People are walking (57% of respondents) and biking (40% of respondents) for everyday trips; would do so more if facilities and safety are improved.
- Top obstacle to walking was gaps or missing sections of sidewalks or paths (66% of respondents).
- Top obstacle to cycling was motorists do not exercise caution around cyclists (84% of respondents).
- Top improvement needed for both walking (ranked 4.4 out of 5.0) and cycling (ranked 4.5 out of 5.0) was more facilities that connect to major destinations.
- Improving safety for walking and biking is a top priority (ranked 4.4 out of 5.0).

pedestrian and bicycle issues, participated in the Advisory Group. This group met several times and provided advice and direction to guide development of the Plan. The Advisory group also helped share information about the planning process across the State.

User Survey

A bicycle and pedestrian user survey was conducted to understand who is biking and walking in Maryland and to gain insight from the experience and perspectives of Maryland's diverse residents and visitors. Over 3,300 participants responded to the survey over the 10-week period it was available on the project website. The User Survey responses indicate strong desire for improved bicycle and pedestrian infrastructure, as well as safety and education improvements. Missing or poor quality pedestrian facilities was cited as the most common obstacle to walking and improving infrastructure was rated as the top priority for improvement.

Stakeholder Interviews

Numerous stakeholder interviews were conducted with local governments, agency professionals, and advocates around the State. While discussions with these interested parties were wide-ranging, several important themes emerged.

Local governments emphasized that there is a great deal of bicycle and pedestrian planning ongoing within their jurisdictions. In particular, many efforts are focused on increasing participation in bicycling by reaching out to citizens who may not currently ride and developing facilities that offer a higher level of comfort. Shared-use paths and trails, which offer social and economic benefits for communities, have significant potential to increase participation in walking and bicycling for transportation. Western Maryland stakeholders emphasized the importance of trails and shared-use paths as the primary walking and biking resources in the region, where most arterial roads are narrow and high speed. Local governments also recognized the importance of biking and walking facilities on State roads in connecting and completing local street networks.

Public Meetings

The first public meeting in support of the Master Plan Update was held on March 21, 2013 at the University of Baltimore. The focus of the meeting was to introduce the public to the Plan update process and get feedback on the draft vision and goals of the plan. Attendees were also asked to provide input on the top priorities for improving biking and walking in Maryland. The meeting attendees reported general consensus around the draft goals offered for consideration by MDOT and identified extensive and varied strategies to meet the proposed goals.

The second public meeting was held on June 11, 2013 at the Rockville Memorial Library. After a presentation, meeting participants were asked to break up into smaller groups to have discussions with staff members and a straw poll was conducted that asked participants to evaluate the identified objectives of the Plan and list each individual's top eight objectives. An online version of the straw poll let participants who could not attend the meeting vote for their top objectives.

The final public meeting in support of this effort was held on November 13, 2013 at the Talbot County Free Library in Easton. The focus of the meeting was to present the Draft Plan and solicit public feedback on its key initiatives and implementation approach. Following the presentation, a moderated discussion was held at the meeting and with the online participants.

Straw Poll Results

Straw polls were conducted at the June Public Meeting, online, and at an Advisory Group meeting. The straw poll was a small survey that asked participants to identify the objectives they thought were most important from a longer list of draft objectives that had been developed for the Plan. The straw poll was designed to help indicate stakeholder priorities among the many types of bicycle and pedestrian improvements that the Plan includes. The results were not used to eliminate objectives, but instead helped to inform emphasis areas and priorities for implementation. A total of 292 ballots were received over the three outreach efforts. The top five objectives identified were:

- Address network gaps and physical barriers; build connected networks with continuous bicycle accommodations.
- Address key gaps in trail systems and improve integration of trails and on-road facilities.
- Provide assistance and/or incentives to local governments to improve biking and walking.

- Incorporate Complete Streets principles in all State transportation projects, and promote Complete Streets policies at the local level.
- Focus on improving bicycling and walking conditions in locations with the highest demand.

Building Momentum for Bicycle Improvements in Baltimore City

The Baltimore City Department of Transportation has successfully leveraged limited resources to take concrete steps towards increasing the viability of bicycling as a form of transportation. In 2006, responding to residents' desire for improved bicycling facilities, the City developed a Bicycle Master Plan and initiated BikeBaltimore, the City's bicycle program.

While BikeBaltimore does do traditional planning and infrastructure projects, its most unique and successful initiatives have been based on leveraging a positive relationship with Baltimore's engaged bicycling community. Twice a year, the City coordinates volunteer bicycle volume counts to understand patterns in bicycle use of facilities. These data are integral to planning and engineering bicycle facilities, and the City's use of volunteer hours and enthusiasm makes the most of limited staff and funding as it works to keep up with rapidly growing demand citywide.

City support for bicycling and grassroots advocacy includes regular participation in community riding events. The Mayor has participated in several of these monthly Baltimore Bike Party events, during which over a thousand riders ride about 10 miles on a new route through Baltimore City the last Friday of each month.

3. Goals, Objectives, and Strategies

The goals, objectives and strategies described in this section provide the strategic framework for developing and improving bicycle and pedestrian travel in Maryland over a twenty year period. While the Plan focuses on MDOT's role in advancing the vision for walking and biking, it also recognizes the importance of collaboration and support to engage other key partners.

The Plan's vision statement reflects the input of a wide range of stakeholders, as well as the policy direction provided by State law. The vision statement establishes the basic principles on which the goals, objectives and strategies were developed.

Vision

Maryland will be a place where bicycling and walking are safe, practical and inviting ways for people of all ages and abilities to complete their everyday travel. Sound policy will enable communities to craft the best solutions to their unique mobility and access challenges, and to reap the social, economic, health and environmental benefits of expanded transportation choices. Smart prioritization and creative collaboration will ensure wise and effective use of all State resources.

The five goals articulate key focus areas for advancing biking and walking that, taken together, will achieve the vision statement. The goals support the direction provided by the 2035 MTP and PlanMaryland, reflecting a community-based approach that recognizes that transportation needs and appropriate solutions vary across Maryland.

Several objectives and strategies are identified for each goal. The objectives are the conditions that mark progress toward each goal. The strategies are specific actions that MDOT intends to pursue to accomplish each objective. The goals, objectives and strategies are presented in no particular order. An estimated timeline has been assigned for each strategy, and rough cost estimates are provided for the implementation of each goals. The planning-level cost estimates are based on standard assumptions about costs for various types of improvements and initiatives and projects currently in the pipeline. Bicycle and pedestrian projects are often identified in local and regional plans, rather than statewide plans.

Costs are estimated and not for programming purposes.

Goal 1: Build Connected Networks

Expand walking and bicycling networks, remove barriers, and enhance connections with transit and travel destinations.

To support biking and walking, bicycle and pedestrian facilities need to form complete networks to connect people, as directly as possible, to their desired destinations. Walkers and bikers demand a safe and comfortable experience across the entire length of their journey. Due to the relatively low speed of these transportation modes, even small detours may significantly increase the amount of time required to make a trip. Planning for these modes requires careful consideration of complete networks, rather than individual facilities. For this reason, bicycle and pedestrian improvements should be targeted to fill gaps in network connectivity to have the biggest impact.

Network connectivity involves filling gaps in sidewalks and bicycle facilities along state roadways, as well as increasing attention to connections with local routes and trails. Careful attention to crossing state highways is critical, as these facilities tend to be the busiest and most uncomfortable places for walking and biking. Connectivity between biking and walking networks and transit is critical to enabling multimodal travel. While the State will continue working to improve bicycle and pedestrian conditions statewide, a community-based approach that increases focus on areas with the highest demand for walking and biking will leverage the greatest benefits.

Estimated Cost: $600 million-2.0 billion *(not for programming purposes)*

Objective 1A: Develop connected and accessible networks of bicycle and pedestrian accommodations along state roadways.

Strategies	2013-2018	Ongoing
1. Complete retrofits of existing facilities to achieve full ADA compliance of existing facilities and encourage the use of ADA best practices to maximum extent reasonable within the constraints of a specific project or program.		✔
2. Identify and eliminate short gaps in existing sidewalk and bicycle transportation systems, including pinch points where bikeable shoulders disappear.	✔	
3. Promote timely and effective coordination with utility companies (e.g., to relocate utility poles outside of sidewalk paths and encourage clear zones for possible future sidewalks).		✔
4. Develop strategies for addressing bicycle and pedestrian barriers created by limited access highways, free flow ramps, railroads, bridges and major arterials.	✔	
5. Improve bicycle facilities as part of routine maintenance and system preservation activities.		✔

Objective 1B: Improve integration of bicycle and pedestrian transportation with transit.

Strategies	2013-2018	Ongoing
1. Support implementation of bicycle and pedestrian improvements as identified in station access and other plans.		✔
2. Provide covered bicycle parking spaces at rail transit stations and park & ride lots where demand for bicycle access exists or is likely. Provide high security bike parking at stations and lots where needed.	✔	

Strategies	2013-2018	Ongoing
3. Work with local governments, regional planning agencies, developers and transit agencies to build needed facilities along prioritized pedestrian routes within 1 mile of transit stops and park & ride lots, and prioritized bicycle routes within 3 miles of transit stops and park & ride lots.	✔	
4. Support installation of bike share stations at transit hubs and other high demand locations, and incorporate siting guidelines into appropriate guidance documents.	✔	
5. Support Transit Oriented Development (TOD) that is designed to improve bicycle and pedestrian access.		✔
6. Incorporate bicycle and pedestrian access, safety and comfort in bus stop location decisions.		✔
7. Pursue the inclusion of positions for bicycles on transit vehicles for existing and planned services.	✔	

Objective 1C: Prioritize the enhancement of pedestrian and bicycle travel in areas with high potential for short trips that can be accomplished by walking and biking

Strategies	2013-2018	Ongoing
1. Refine identification of short trip opportunity areas in consultation with local jurisdictions and consistent with the 2035 MTP place types and broader State policies such as PlanMaryland and Sustainable Communities.	✔	
2. Tailor policies, design and operational guidelines to reflect multimodal context in short trip opportunity areas.	✔	
3. Increase coordination between road, transit and land development managers to enhance pedestrian and bicycle travel in short trip opportunity areas, encouraging public and private support to secure desired bicycle and pedestrian amenities.		✔
4. Designate Bicycle Pedestrian Priority Areas (BPPAs) in coordination with local governments for focused planning, funding and intervention to improve bicycle and pedestrian networks.	✔	

Objective 1D: Improve links between shared-use paths and on-road facilities and address key gaps in transportation trail systems

Strategies	2013-2018	Ongoing
1. Prioritize completion of identified missing links in state and local transportation trail networks that enhance active transportation options.		✔
2. Work with local partners to improve access between existing shared-use paths and nearby roads, activity centers and communities by encouraging private sector participation, and coordinating signage and connector facilities.		✔
3. Improve bicycle and pedestrian access to major trails and public lands.		✔
4. Investigate innovative approaches to stormwater management appropriate for non-motorized public trails and shared-use paths.	✔	
5. Engage utility companies/commissions about the use of utility corridors for shared-use paths.	✔	

Goal 2: Improve Safety

Enhance pedestrian and bicycle safety to reduce injuries and fatalities and to make walking and biking comfortable and inviting.

Safety is paramount in all of MDOT's work. Pedestrians and bicyclists are particularly vulnerable users of the transportation system, and though pedestrian and bicyclist fatalities and serious injuries have decreased in recent years, improving safety must continue to be a priority. In addition, improving the perception of safety is also important to increasing levels of walking and biking. For Marylanders to consider walking or bicycling as a viable means of transportation, they must feel safe doing so. Providing appropriate facilities, educating the public on safe travel behavior and promoting enforcement of traffic laws most likely to reduce crashes, injuries and fatalities are important steps toward this aim. Improving actual and perceived safety will continue to be a collaborative effort that must include State agencies, local agencies, law enforcement, advocacy organizations and the general public.

Improving non-motorized crash and injury data collection, analysis and report dissemination will help the state identify better safety strategies. This includes beginning to systematically collect crash and injury information from trail users, EMS and hospital emergency room reports. Continued education and training of professionals, other policy makers, and the public will improve safety by constructing safer facilities and improving behavior of all road users. Likewise, performing regular maintenance of bicycle and pedestrian facilities is critical for ensuring safety.

Estimated Cost: $40-100 million *(not for programming purposes)*

Objective 2A: Improve education and training of professionals involved in bicycle and pedestrian safety.

Strategies	2013-2018	Ongoing
1. In cooperation with the Maryland State Police and other partners, continue to develop methods to ensure that Maryland's traffic enforcement officers receive adequate training about current bicycle and pedestrian laws and crash investigation protocols.		✔
2. Continue to incorporate bicycle and pedestrian safety in professional training opportunities, encourage participation in walking and biking and increase participation in pedestrian safety audits.		✔

Objective 2B: Improve education and training of the public regarding safe driving, walking, and biking.

Strategies	2013-2018	Ongoing
1. Continue public education for all road users, including children, about current laws and best practices for bicycle and pedestrian safety.		✔
2. Ensure that public and private driver training schools are providing correct and adequate training related to bicyclist and pedestrian safety.		✔
3. Ensure bus driver and commercial vehicle training includes bicycle and pedestrian related safety information	✔	

Objective 2C: Use best practices to analyze bicycle and pedestrian crashes and identify effective countermeasures.

Strategies	2013-2018	Ongoing
1. Incorporate new research and best practices for crash analysis, safety audit, and mitigation regularly.		✔
2. Work to increase and improve bicycle and pedestrian crash data available to support analysis by the State as well as local governments and stakeholders through the use of bicycle and pedestrian counts, user surveys, EMS and hospital reports as well as police reports. Work to improve data for crashes occurring on shared use paths.	✔	
3. Develop and publish bicycle and pedestrian crash reports analyzing crash types, trends and other relevant data.		✔

Objective 2D: Ensure consistent operations and maintenance to provide safe access for pedestrians and cyclists.

Strategies	2013-2018	Ongoing
1. Review maintenance and temporary traffic control protocols to ensure consistent, safe access for pedestrians and cyclists.	✔	
2. Provide information on appropriate State and local contacts for reporting maintenance concerns.		✔
3. Encourage local efforts to ensure consistent maintenance of locally-maintained sidewalks and paths, for example by sharing effective practices and communicating observed issues and educating local jurisdictions about available resources.		✔

Goal 3. Plan and Design for Everyone

Effectively balance the needs of all transportation users to promote travel choices, ensuring that bicyclist and pedestrian needs are prioritized in appropriate locations.

Working toward an integrated, multimodal transportation system requires all modes of transportation be considered, respected and balanced appropriately as a routine part of all decision making. Maryland has been a leader among state transportation agencies in adopting this approach, beginning with Thinking Beyond the Pavement in the mid-1990s continuing recently with the formal adoption of a Complete Streets policy in 2012. Yet, there is much work to be done. Balancing user needs involves recognizing different opportunities and priorities available in different types of places, and prioritizing bicycle and pedestrian improvements accordingly. Also, different subgroups of pedestrians and bicyclists (such as children, the elderly, inexperienced bicyclists, people with limited mobility, and others) may have different facility needs. Evaluating these needs comprehensively and striving to accommodate as many user types as possible is an important element of Complete Streets and critical to increasing walking and biking in Maryland.

As bicycle and pedestrian treatments continue to innovate and evolve, the State must continue to keep abreast of the latest research and guidance. Tools for planning, design, and evaluation of bicycle and pedestrian facilities should be improved and shared broadly across agencies at all levels. Increasing funding over time will allow for greater implementation of walking and biking networks.

Estimated Cost: $10-30 million *(not for programming purposes)*

Objective 3A: Strengthen evaluation of bicycle and pedestrian conditions to support multimodal decisions.

Strategies	2013-2018	Ongoing
1. Enhance evaluation of the needs of "interested but concerned" cyclists, pedestrian comfort and expectations in different roadway environments and land use contexts.	✔	
2. Refine design guidelines and policies to incorporate sensitivity to context and bicycle and pedestrian trip potential when balancing user needs in multimodal roadway environments. Consider potential performance measures to evaluate complete streets and context sensitive design processes.		✔
3. Increase collection and use of data about bicycle and pedestrian travel to support planning, programming and design, including mapping and non-motorized counts.		✔

Objective 3B: Increase professional capacity to effectively plan, design, implement and maintain infrastructure for bicycling and walking.

Strategies	2013-2018	Ongoing
1. Expand support of training opportunities for transportation professionals and others regarding non-motorized transportation issues.	✔	
2. Support and encourage educational opportunities for local leaders and elected officials as well as students in the transportation engineering and planning fields related to bicycle and pedestrian accommodation.		✔

Objective 3C: Increase use of innovative design solutions to enhance safety and comfort of bicycle and pedestrian users.

Strategies	2013-2018	Ongoing
1. Encourage the use of existing processes to implement pilot projects on State roadways to test innovative design treatments such as cycle tracks, colored bike lanes, and new pedestrian crossing treatments, following a context sensitive design approach.	✔	
2. Increase flexibility to implement alternative bicycle and pedestrian improvements beyond state facilities, where effective and appropriate.	✔	
3. Leverage existing protocols to seek input from leading transportation planning and design professionals regularly to stay current with proven approaches to road design that make bicycling and walking safer and more attractive.		✔

Objective 3D: Leverage funding opportunities to improve bicycle and pedestrian networks.

Strategies	2013-2018	Ongoing
1. Support bicycle and pedestrian facility improvements both as an integral element of all transportation projects as well as through dedicated funding for bicycle and pedestrian projects.		✔
2. Leverage local funding contributions and incorporate bicycle and pedestrian improvements by private developers through transportation impact mitigation processes where feasible.		✔

Goal 4: Strengthen Communities

Partner with local governments to support walkable and bikeable communities to achieve sustainability, livability, health, equity and economic benefits.

Walkability and bikeability of the places we live is widely supported by public health organizations for its benefits to community health both from increased activity and the potential for decreased pollution. They are often supported by citizens and neighborhood groups for the improvements to mobility choices and quality of life. Places that can support vibrant foot traffic also benefit local businesses, especially small businesses. This benefit comes not only in direct ways because of increased access by customers, but indirectly through supporting lifestyles that require less income to be spent on owning and maintaining a vehicle, and reducing costs associated with providing customer parking. The State can support local efforts to achieve these benefits by educating and sharing success stories, being flexible to support and encourage local efforts to improve bikeable and walkable environments.

These efforts can be direct, through assistance and incentives to local governments, or indirect, through supporting local planning efforts as stakeholders and property owners. The State can help improve coordination between agencies, with local governments, and with educational institutions. Improved outreach and engagement with the community on all projects is critical to supporting its goals and vision.

Estimated Cost: $30-200 million *(not for programming purposes)*

Objective 4A: Provide assistance and incentives to local governments to improve biking and walking.

Strategies	2013-2018	Ongoing
1. Provide funding support and technical guidance for the development of local bicycle and pedestrian plans and projects.		✔
2. Support efforts to share successful bicycle and pedestrian policies and guidelines and educate partners about available resources for models and case studies.	✔	
3. Review, approve and adopt, as necessary, any professionally published bicycle, pedestrian, or urban design guidelines including NACTO, AASHTO, ITE, and others as soon as they become available.	✔	
4. Encourage local jurisdictions to identify desired bicycle and pedestrian facilities in comprehensive plans, and then to secure those facilities through private development and other opportunities.		✔

Objective 4B: Improve coordination between state agencies, and with local governments to support bikeable and walkable communities.

Strategies	2013-2018	Ongoing
1. Coordinate with local jurisdictions and other State agencies to promote and facilitate bike and walk friendly street design, placemaking and development (ex. parklets, bicycle parking, plazas, seating, etc.).		✔

Strategies	2013-2018	Ongoing
2. Coordinate with partner agencies to implement complete streets and trails	✔	
3. Promote siting and design practices that encourage biking and walking to public facilities (schools, medical centers, state offices, etc) and increase connectivity and access to and within adjacent neighborhoods.		✔
4. Lead by example by creating access and facility guidelines for State employment sites and educational institutions.	✔	

Objective 4C: Support efforts to increase biking and walking to schools, colleges and universities.

Strategies	2013-2018	Ongoing
1. Encourage local public school officials to support biking and walking to school, by providing reference materials, bike racks at schools and supporting bike-to-school day programs.	✔	
2. Provide infrastructure that supports safe bike and walk access for students, faculty, staff and visitors.		✔
3. Work with the University System of Maryland and post-secondary institutions of education to improve walk and bike access to and within their campuses and ensure compliance with § 21-1008(b).[13]		✔
4. Encourage Maryland communities, businesses and universities to pursue Bicycle Friendly and Walk Friendly awards.		✔

Objective 4D: Expand outreach and engagement in bicycle and pedestrian initiatives.

Strategies	2013-2018	Ongoing
1. Increase outreach regarding funding opportunities and engagement in context sensitive project development and design.		✔
2. Promote innovative public involvement strategies for local and state projects, such as use of social media and text message surveys.		✔
3. Educate local leaders and elected officials on the benefits of biking and walking and opportunities for state support.		✔

Goal 5: Promote Walking and Biking in Maryland

Support walking and biking as everyday modes of transportation and recreation and vital elements of a livable community through encouragement, marketing, and information.

In addition to the perception that walking and bicycling are safe modes of transportation, feeling that they are enjoyable and encouraged can also help Marylanders consider these modes for certain trips. High quality information about available facilities, routes to important destinations, safe use of bicycle and pedestrian facilities, and recreational opportunities can also help both residents and visitors take advantage of the State's bicycle and pedestrian amenities and improvements.

Treating walking and bicycling as regular and expected modes of transportation with a broad diversity of participants can help improve perceptions. The State can provide better access to walking and bicycling information and wayfinding. It will also continue work to support Maryland's growing bicycle tourism industry.

Estimated Cost: $20-100 million *(not for programming purposes)*

Objective 5A: Promote bicycling and walking as normal transportation modes to a broad diversity of participants.

Strategies	2013-2018	Ongoing
1. Develop public outreach and education programs with information about benefits of biking and walking, such as: safety, economic development, community livability, public health, and decreased traffic congestion.	✔	
2. Develop marketing initiatives to promote bicycling and walking in key target audiences (eg. urban commuters, colleges and universities, employers, women, economically disadvantaged, ethnic minorities, non-English speakers).		✔
3. Support financial incentives for bicycle commuting in the Commuter Choice Maryland program.	✔	

Objective 5B: Improve access to bicycling and walking information and wayfinding.

Strategies	2013-2018	Ongoing
1. Develop print and electronic maps showing biking and walking facilities and ensure that information is consistent with signed bike routes.	✔	
2. Notify the public during and shortly after construction of improved bike and walk facilities by posting signs at or near work sites.		✔
3. Improve wayfinding signage to better orient cyclists and pedestrians to pathways and amenities. Establish a statewide bicycle wayfinding sign system that addresses on-road and off-road routes, and state, regional and local route systems.		✔

Objective 5C: Support growth in bicycle tourism in Maryland.

Strategies	2013-2018	Ongoing
1. Support the physical development and public awareness of major regional and national trails and bicycle routes that pass through Maryland.		✔

Strategies	2013-2018	Ongoing
2. Support biking and walking improvements to help communities near major trails leverage economic benefits of trail tourism.	✔	
3. Coordinate with business and economic development organizations to develop and promote biking and walking resources and activities.		✔
4. Coordinate with local jurisdictions to support designation of US Bicycle Routes through Maryland in coordination with State bicycle routes.		✔

Canal Towns and Trail Towns Partnerships

Towns along the C&O Canal and the Great Allegheny Passage (GAP) have joined the Canal Towns and Trail Towns partnerships. These partnerships provide tools to help towns along the trails leverage their proximity to the trail to realize economic development and community revitalization benefits associated with trail-based tourism.

The Trail Towns Program® is a project of The Progress Fund developed in conjunction with the Allegheny Trail Alliance (ATA). Participating towns, including Cumberland and Frostburg, have pages on the ATA website, www.ATAtrail.org, featuring easily accessible maps, directions, and lists of lodging, restaurants, and other amenities. The Trail Towns Program advertises the following key actions for becoming a successful Trail Town:

- Enticing trail users to get off the trail and into your town.
- Welcoming trail users to your town by making information about the community readily available at the trail.
- Making a strong and safe connection between your town and the trail.
- Educating local businesses on the economic benefits of meeting trail tourists' needs.
- Recruiting new businesses or expanding existing ones to fill gaps in the goods or services that trail users need.
- Promoting the "trail-friendly" character of the town.
- Working with neighboring communities to promote the entire trail corridor as a tourist destination.

In addition, another website, ***trailtowns.org***, has information for business owners and entrepreneurs along the GAP Trail. Targeted uses include restaurants, hostels, campgrounds, outfitters, and bike shops.

The site has information about business planning, available properties, market, and socio-demographic data about trail users, and information about financing opportunities through the program. Since the program's beginning in 2007, The Progress Fund has made 23 loans to Trail Town businesses, leveraging $6.7 million in total investment.

The Canal Towns Partnership (CTP) was formed by a group of volunteers in 2009 with similar goals. The CTP seeks to assist the communities along the C&O Canal towpath in reaping the multiple benefits of trail-based tourism and recreation. The CTP focuses on economic development strategies and supporting communities that connect to the C&O Canal in becoming more bikeable and walkable. Representatives of the eight participating towns meet monthly to discuss visitor attraction strategies and collaborative marketing efforts and to explore ways to improve visitor services and amenities in their communities. Accomplishments of CTP to date include:

- A successful application for assistance from the National Park Service through the Rivers, Trails, and Conservation Association.
- Design and development of business directories in each community at the trail access point with business listings of services, a town map and historical information.
- Bike lanes developed, directional signage and bike racks installed in the towns.
- Coordinated wayfinding signage with the C & O Canal National Historical Park.
- Successful funding of a Canal Towns web site and Canal Towns brochures offering visitor services.

4. Implementing the Plan

Achieving the vision and goals of this Plan will require the continued commitment of MDOT and its modal administrations, as well as support and leadership from partner agencies and organizations. Guided by the strategies identified in this Plan, MDOT will continue working to meet bicycle and pedestrian use of state roadways and access to MTA transit services; to increase safety on Maryland roads through driver testing administered by the MVA, bus operator training provided by the MTA. While MDOT provides support and incentives to complementary local road and trail projects, leadership and commitment at the local level is essential to realizing the vision of this Plan. Support and partnership with other State, Federal, and regional agencies, in areas of planning, funding, design and enforcement, businesses, non-profits and other stakeholders in Maryland are also critical to comprehensively addressing bicycle and pedestrian needs.

Complete Streets Approach

MDOT is working to implement an integrated approach to all projects, in which bicycle and pedestrian needs will be considered and included as a part of all appropriate projects and policies. Dedicated programs, appropriate funding and well-trained staff to address bicycle and pedestrian needs will continue to be important factors to achieve a balanced network that serves all users. A first step, however, will be to ensure that pedestrian and bicycle travel options are considered as integral elements of the broader transportation network, so that project development efforts routinely advance the goals of this Plan and support MDOT's mission to provide a multimodal transportation system for Maryland.

Maryland's "Complete Streets" approach means that MDOT embraces a balanced approach that ensures the state transportation network addresses the needs of all users, regardless of travel mode. This means that all transportation projects will be mindful of improving streets for drivers, transit users, pedestrians and bicyclists, making it safe and easy for people to walk and bike to and from transit stops and other travel destinations. The Complete Streets approach recognizes that transportation modes are interdependent. For example, improving the productivity of transit helps reduce congestion for drivers, but may also require better bicycle and pedestrian access and connections to encourage transit use. It does not, however, mean that all users will have equal priority on all roadways. The objective, rather, is to promote the creation of an integrated multimodal transportation system that will allow people to choose the travel mode and pathway that best meets their needs for safe and efficient travel. The actions and ideas expressed in this plan are only part of this much broader Complete Streets policy and process.

What are "Complete Streets"?

Complete Streets are streets for everyone. They are designed and operated to enable safe access for all users. People of all ages and abilities are able to safely move along and across streets in a community, regardless of how they are traveling. Complete Streets make it easy to cross the street, walk to shops, and bicycle to work. They allow buses to run on time and make it safe for people to walk to and from train stations.[14]

Key Initiatives

Four key initiatives are identified as short-term implementation priorities. These initiatives are integral to advancing the Department's Complete Streets organizational culture, and will create a foundation for pursuing many of the strategies included in this Plan. The key initiatives will be important vehicles for ensuring that pedestrian and bicycle needs are ingrained in all projects and all users are provided safe, comfortable access to Maryland's transportation facilities.

Key Initiative 1: Tailor Approaches to Local Context

Bicycle and pedestrian travel are very closely related to local conditions and appropriate approaches to supporting these modes varies depending on the context. MDOT has recognized this for many years through its commitment to context-sensitive design. This initiative is the next step in advancing the context-sensitive approach by recognizing more explicitly in departmental decision guides and processes that pedestrians and bicyclists may need to be evaluated and accommodated differently in different place types.

The 2035 MTP identified four transportation place types with corresponding investment direction and example strategies: Urban Centers, Towns and Suburban Centers, Rural and Agricultural Areas, and Natural Areas. These place types are consistent with the planning areas established by PlanMaryland and ongoing designation of Sustainable Communities as priorities for State revitalization efforts. Based on stakeholder input and recognizing high opportunity for pedestrian and bicycle travel and concentration of pedestrian and bicycle crashes, the initial focus for this initiative will be tailoring approaches to support biking and walking in urban centers and main street areas.

Urban and Main Street Approach

The characteristics of urban centers and main streets make them both uniquely challenging and highly productive locations for bicycle and pedestrian travel. Urban centers have a higher density of people and travel destinations leading to many short trips. This concentration puts particular demands on the transportation infrastructure because of the number and type of transportation users: many short trips occur; parking is often less available; last mile connections from transit are made by walking or biking; and more people are able to accomplish their daily needs without access to a vehicle.

People accessing each of Maryland's urban centers and main streets travel from nearby neighborhoods, as well as suburbs and other cities; they use every mode of transportation available, often in combination. There is very little "extra" space within the network of urban transportation, and supporting multimodal travel in these areas requires carefully balancing the needs of the many users and travel modes. As discussed on page 20, over 80% of the bicycle and pedestrian crashes reported in Maryland between 2006 and 2011 occurred within just 8% of the State where high density, mixed land uses exist.

As a framework for developing a tailored approach for urban centers and main streets, the areas identified in the Short Trip Opportunity Areas map on page 19 will be used as the basis for developing tailored approaches for urban centers and main streets. The map may evolve through discussions with stakeholders and as the transportation place types identified in the 2035 MTP. Consistency with PlanMaryland, Sustainable Communities and local plans will be considered. The specific context, roadway users, and multimodal potential will continue to be evaluated on a project specific basis to determine where an approach for urban centers and main streets should be applied.

Thoughtful, targeted approaches to transportation decision-making in these high activity contexts will help maximize the benefits of improvement projects, meet the safety and mobility needs of residents and visitors who depend on walking and bicycling, and get the best results out of the inevitable tradeoffs necessitated by constrained urban rights of way. Managing urban, multimodal roadway environments requires tools and policies to make decisions based on impacts to all users.

Development of a tailored approach for urban centers and main streets recognize that enhancement of bicycle and pedestrian travel in these areas is a priority and will involve review of policies, investment priorities and design guidelines. Specific issues to be addressed may include:

- Amending roadway design and operations guidelines to facilitate bicycle- and pedestrian-friendly design, such as traffic calming, lighting, signal operations, reduced signal spacing and enhanced intersection treatments.
- Emphasizing walking and biking in partnership with local agencies as part of private development review and permitting and work zone temporary traffic control plans.
- Targeting safety programs, such as Pedestrian Roadway Safety Audits and implementing safety projects as funding allows.
- Prioritizing funding with programs designed to enhance bicycle and pedestrian accommodation.
- Helping local jurisdictions identify resources for planning, designing, building and maintaining bicycle and pedestrian facilities.
- Modifying traffic impact assessment standards to balance all travel modes appropriately.
- Supporting education, encouragement and enforcement initiatives.

Key Initiative 2: Pilot a Bicycle and Pedestrian Priority Areas (BPPA) Program

Building on the effort to identify short trip opportunity areas and tailor work in these areas to better reflect multimodal travel potential, MDOT will pilot a Bicycle and Pedestrian Prioritization Area (BPPA) program to foster collaboration with local jurisdictions and support the development of connected bicycle and pedestrian networks in high need locations. In accordance with State law, the designation of BPPAs in consultation with local jurisdictions will help target available funds to areas of the State most in need. The BPPA Program will create a focused partnership between the State and local jurisdiction to plan and implement bicycle and pedestrian improvements within several small priority areas.

BPPA Program

The BPPA Program is envisioned as a short-term cooperative program that will entail development of a plan and implementation of priority bicycle and pedestrian improvements in top priority locations around the State. Designation as a BPPA would secure resources for a focused transportation planning effort and for bicycle and pedestrian improvements that could be provided through State managed improvements to State facilities or through grant funds provided to the local partner to implement improvements off the State system.

Once an MDOT team designates an area as a BPPA, the State will work together with the local jurisdiction to develop a pedestrian and bicycle plan to identify and prioritize needed improvements and to evaluate local policies needed to maintain and support biking and walking. As outlined in the Annotated Code, these plans shall identify: (1) physical changes to the State highway infrastructure to increase safety and access for bicycle and pedestrian travel; and (2) appropriate use of traffic control devices. Designation of a BPPA will entail dedication of some funding to implement priorities identified in the BPPA plan.

This process will emphasize cooperation and collaboration between the State and local jurisdictions to address bicycle and pedestrian opportunities. It recognizes the completeness of system connections as critical to the walking and bicycling experience and acknowledges the State's limited but important role in enhancing conditions off the State-controlled roadway system.

Besides helping to focus funding on places with demonstrated desire for pedestrian and bicycle improvements, the BPPA program structure will also foster ongoing cooperation between the State and local communities. The best bicycling and walking facilities connect origins and destinations in a direct manner with few gaps in comfortable facilities. The high level of cooperation and partnership that BPPA communities will have with MDOT recognizes that such connected networks omust include both State and local facilities. The BPPA Program will help focus state and local partners on building high quality connected networks, as opposed to single, unconnected projects.

All BPPAs will be included as short trip opportunity areas to reinforce BPPA improvements and ensure that bicycle and pedestrian travel are recognized as priorities on an ongoing basis once the BPPA plan and projects are complete.

BPPA Designation

MDOT and SHA have begun developing a process and criteria for designating BPPAs. BPPA designations will not be limited to the identified short trip opportunity areas, though similar criteria may be used as part of the screening. The criteria for designation may include

- Demand or potential for walking and biking based on existing land uses, household characteristics and proximity to existing trails or transit.
- Safety record and concerns.
- Demonstrated local commitment to supporting walkability and bikeability (e.g. Adopted legislation enacting a Complete Streets policy, Approved bicycle and pedestrian plan in place that identifies prioritized infrastructure needs, Active in Safe Routes to School program, Zoning and roadway design manual in place to support pedestrian and bicycle friendly development, Mechanism in place to maintain and install sidewalks, Development requirements include active transportation review and promote and prioritize walking and biking).
- Consistency with state and local policy priorities and designations, such as Maryland TOD designation, Sustainable Community designation, Arts & Entertainment District designation, Designated Maryland Main Street, and PlanMaryland Planning Areas.

Key Initiative 3: Complete Streets Training

Complete Streets is the State of Maryland's approach to "achieving an interconnected, multi-modal transportation network throughout Maryland that supports access and travel for all users." [15]

MDOT is committed to planning and designing the transportation system to meet the needs of every community member, regardless of their age, ability, or how they travel. A key facet of this is ensuring that transportation planning and design professionals have the skills and understanding to design projects that serve the needs of all users.

Training offered to MDOT employees will be evaluated to ensure that current research and guidance related to Complete Streets concepts are incorporated and reinforced. Additionally, MDOT and its modal administrations will ensure that all appropriate staff are trained in the Complete Streets approach, in a manner that is applicable to their job responsibilities. The field of bicycle and pedestrian facility design is rapidly evolving. New research and guidance on tools and treatments that improve safety and mobility is regularly updated. Frequent training is important to ensure that transportation professionals are applying the best available information and implementing improvements that promote safety and facilitate walking and bicycling. All training conducted by MDOT and its modal agencies should incorporate complete streets elements, including bicycle and pedestrian considerations to strengthen multimodal skills and decision making.

Complete Streets training for planners and engineers will address the technical design aspects of a Complete Streets approach as well as underlying rationales. The number of people walking and bicycling has increased over the last several years, and by most projections this increase will continue. However, not all of these new walkers and bicyclists will experience the transportation system in the same way. Unlike driving in a car, bicyclists and pedestrians are much more sensitive to their immediate surroundings. Pedestrians and bicyclists have a wide range of abilities and different experience levels. Accordingly, design solutions that work in one context may not work in another and must consider the needs of a wide range of users. Training will address the range of users and need for outreach and communication with stakeholders.

Where possible, trainings will couple course work with practical exercises and field evaluation in a variety of settings. Field training can cultivate an enhanced awareness and understanding of interactions between modes and considerations for bicycle and pedestrian planning.

MDOT will also encourage key partners to develop the skills needed to plan and design local facilities with the same priorities, and will seek to provide leadership in this regard. Local support is critical because local roads and trails are important elements of the statewide multi-modal transportation network. MDOT will seek opportunities

to support or provide training to local transportation and planning staff, elected officials, professionals, and others with an interest in complete streets.

Key Initiative 4: Improve Bicycle and Pedestrian Needs Assessment

Strive to accommodate "interested but concerned" cyclists and increase pedestrian comfort

Achieving the vision for increased walking and biking in Maryland will require providing facilities that feel comfortable, safe and inviting to all users. Over the last decade, the State has made significant progress in developing policies to provide bicycle and pedestrian accommodation as a routine element of road improvements. However, depending on the roadway speed, level of traffic, physical environment, and individual preferences, basic accommodation may not be sufficient to attract bikers and walkers.

Moving forward, MDOT will strive to develop networks that meet a broader range of cyclist and pedestrian needs. Due to limited rights-of-way, budgets and conflicting needs, in many cases it will not be possible to meet every user's needs. However, MDOT will work to improve the evaluation of bicycle and pedestrian needs in order to support balanced decisions and trade-offs. The State will continue to work on improving its evaluation criteria and methodology for bicycle and pedestrian needs to support fully informed Complete Streets decision-making. This will require continuing dialogue with the public to understand what types of facilities are needed to attract more users, and supplementing existing methods used to evaluate bicycle and pedestrian needs and progress. Many tools have been created to assist community members, transportation professionals and others who might be involved in planning for safe walking and bicycling travel. Some assessment tools work best evaluating smaller local projects while others work best when assessing conditions at a regional or statewide level. Key areas for enhancing analysis of bicycle and pedestrian needs include:

- **Developing different evaluations for rural and urban roadways** – What may be considered appropriate in rural areas, may not meet the needs of bicyclists and pedestrians in urban parts of the State. This is due to the significant differences in traffic speeds, land uses, built environment and topography, and available right of way. To this end, facilities in different land use contexts should be evaluated differently.
- **Calibrating bicycle evaluation to less confident cyclists** –The State currently utilizes the Bicycle Level of Comfort (BLOC) model to help determine which roads have the greatest need for bicycle focused improvements. This tool is generally appropriate to assess on-road conditions and facilities for cyclists who are comfortable with the idea of riding on the street. However, this methodology does not account for variations in bicyclists' level of experience (i.e., novice,

Related Policies and Design Guidelines

Transportation Designers and Engineers have several manuals that they routinely consult to assist them in the design of the various bicycle and pedestrian projects. These resources include the following:

- SHA Accessibility Policy & Guidelines for Pedestrian Facilities along State Highways
- SHA Bicycle Policy and Design Guidelines
- SHA Transit Guidelines
- SHA Transit Oriented Development Guidelines and Plans
- FHWA Manual on Uniform Traffic Control Devices (MUTCD) Guidelines
- Transportation Research Board Highway Capacity Manual Guidelines
- AASHTO Highway Safety Manual
- Context Sensitive Solutions for work on Maryland Byways
- When Main Street is a State Highway
- Thinking Beyond the Pavement
- Flexibility in Highway Design
- Scenic Byways: A Design Guide for Roadside Improvements
- NACTO Urban Bikeway Design Guide
- NACTO Urban Street Design Guide

interested but concerned, enthused and confident, strong and fearless). Additionally, this methodology does not account for conditions on off-street and separated facilities (e.g., paths, trails, cycle tracks) which may be preferred by more novice riders. Other available measures should be used to better account for bicyclists' experience as well as conditions throughout separated and off-street facilities.

- **Measuring pedestrian comfort factors** such as crossing distance, intersection spacing and buffer from traffic will be important to understand the conditions of the statewide pedestrian network. Currently, the State analyzes ADA compliance to understand conditions within its existing pedestrian network. While this is a great tool to understand where gaps or barriers are present, ADA compliance does not help understand level of comfort. Existing tools, such as the Pedestrian Level of Service (PLOS), could help bridge that void and help understand a person's experience while walking along state roadways. This in turn, could help the State further prioritize its efforts in promoting comfortable walking conditions throughout its roadways.

While MDOT continues to use ADA compliance and BLOC as conditions assessment tools, it has also started evaluating other tools to complement their assessment of state roadways. It has also continued to promote new initiatives to understand and share data related to roadway conditions with the public. As data collection methods and GIS data have become more complex, MDOT is working to incorporate additional ways of understanding roadway conditions that will help prioritize improvements and promote projects that improve bicycle and pedestrian conditions for all users. The safety and comfort of bicyclists and pedestrians are important but complex issues, and the State will continue to improve the tools it uses to understand conditions for bicycling and walking.

Coordination and Partnership

MDOT plays a crucial role in organizing the key partnerships that will make this Plan successful. It serves as the liaison between various state agencies and the federal level. It also coordinates with local and regional governments on bicycle and pedestrian issues, programs, and projects. In many cases, local communities desire to improve their bicycling and walking conditions, and rely on the State as a partner to help identify funding sources, connect networks along and across State facilities, and provide accurate data for prioritization and assessment. Finally, MDOT has responsibilities outside of transportation in coordinating with the public health community, employers, developers, and advocacy organizations. Some key areas where coordination and partnership will help advance the goals of this Plan include:

- Collect, coordinate and share data that are necessary for common bicycle and pedestrian related analyses.
- Aggregate and disseminate good information about the benefits of walking and bicycling.
- Serve in an advisory role to local jurisdictions, providing technical assistance and guidance in support of state policies.
- Use statewide data to point out key network gaps to local areas and coordinate connection of local and State bicycle and pedestrian networks.
- Communicate the innovative solutions being implemented between jurisdictions facing similar situations in different locations across the State.

The Bicycle Level of Comfort (BLOC) provides an assessment of bicycling conditions throughout various roadway segments. By measuring different characteristics of a roadway, this model provides results on the level of service and compatibility of that particular roadway.

The Pedestrian Level of Service (PLOS) provides a fine grained assessment of a person's experience walking along the roadway. Because new cyclists tend to ride more slowly, and tend to use off-street facilities more, the PLOS tool may be a reasonable proxy to measure the quality of the accommodation.

- Continue to strengthen consideration of bicycle and pedestrian infrastructure in review of local plans and priorities, including the recommendation of TOD and Sustainable Community designations.
- Coordinate the efforts of local transit operators to support consistent bicycle and pedestrian amenities and last-mile connectivity across connecting systems.
- Work with other State agencies to implement plans, practices, policies and regulations that support and encourage bicycle and pedestrian improvements.
- Coordinate with business and economic development organizations to promote biking and walking resources.

Montgomery College – Rockville Bicycle and Pedestrian Task Force

The Rockville Campus of Montgomery College, a public community college, has a bicycle and pedestrian task force. Composed of college faculty, concerned citizens, students and representatives from the Montgomery County Department of Transportation and MDOT, the task force advises the Rockville campus administrators on ways to make the campus more bicycle and pedestrian friendly from engineering, education, encouragement and evaluation perspectives. Meetings are held in the late afternoon approximately six times per year. Task Force recommendations that Montgomery College has implemented include:

- An annual Bike to Montgomery College Day held in early fall
- Introduction to Bicycling 101 classes for college academic credit
- Non-credit bicycle safety classes through the Workforce development program
- Improved bicycle parking racks

A Capital Bikeshare Station was installed in late 2013 on the campus which is anticipated to increase bicycling's profile as well as the number of bicycle trips between the college and the surrounding community. The task force is working with the college administrators to create a college bicycle club to support bicycling among students, faculty and staff and on other ways to improve bicycling and walking to the campus. It is hoped that the Montgomery College Bicycle and Pedestrian Task Force will serve as a model for other community colleges in Maryland.

Coordinating New Pedestrian Facilities in Easton

SHA is responsible for managing many roads throughout the State that serve as main streets and play important roles in local bicycle and pedestrian networks. Cooperation and coordination between SHA and local communities is essential. Local comprehensive, bicycle, and pedestrian plans are key tools for identifying needed pedestrian facilities on state and local roads.

SHA's regional planner, SHA's District staff, and local staff in the Town of Easton coordinated on a bicycle and pedestrian map to lay the groundwork for pedestrian improvements on roads through the Town. SHA provided data related to pedestrian facilities for State roads. Local planners combined this with local data for local roads to develop a GIS map showing existing sidewalk infrastructure for the full road network in Easton. The map helped the community to identify critical pedestrian network gaps and priorities. These gaps and priorities were then used by the Town of Easton to apply for and receive grants for improvements. The map also assists Easton and SHA with ensuring that developers fill gaps in sidewalks along roads in Easton, as a condition of development.

This concerted effort at local cooperation from SHA and local planning staff helped streamline the planning process and ensure that needed pedestrian improvements were prioritized, documented and communicated in a format that led to implementation.

Accomplishments include new sidewalks, crosswalks, and pedestrians signals at US 50 and Dutchmans Lane and US 50 and Chapel Road; East Rail Trail Spur Line Project; Sidewalk Retrofit Project; and Dutchman's Lane sidewalk, streetscape and road safety improvements totaling over $1.4 million in investments.

Funding

In support of MDOT's mission to provide a balanced, multimodal transportation system and guided by the framework established by this Plan, MDOT will continue to fund bicycle and pedestrian improvements through both dedicated funding programs and as an integral part of broader transportation projects. MDOT's Consolidated Transportation Program (CTP) is developed each year for approval by the State General Assembly and the Governor. The CTP reflects input on funding priorities from many sources, including state, regional and local plans, annual priority letters sent to MDOT by local jurisdictions, public and elected official requests, and needs identified by MDOT's modal administrations. Through the State Report on Transportation, MDOT demonstrates that funding levels reflect the priorities and mission of the MTP and support broader State plans and policies. MDOT will review funding programs and make any needed adjustments to ensure that funds are available to advance the goals, objectives and strategies of this Plan, and to support a steady pipeline for priority projects to advance from planning through design, construction, evaluation and maintenance.

Many of the objectives and strategies identified in this Plan will require significant investments of time by both MDOT staff and partners to coordinate, plan, educate, promote and evaluate bicycle and pedestrian needs, but may not require large capital investments. While other objectives and strategies, particularly those related to building and improving the physical infrastructure for cycling and walking will require significant investment of transportation resources over time.

Approximately 25% of MDOT's investments in bicycle and pedestrian projects have typically been provided as grants to local jurisdictions and non-profit organizations. These investments support development of critical links in Maryland's bicycle and pedestrian network, and also support education, enforcement and encouragement programs. Ongoing coordination with partner agencies and organizations will be needed to build support for strong projects that are consistent with the goals of this Plan.

Beyond funding available through the State Transportation Trust Fund, statewide planning initiatives

create opportunities to cross-leverage public and private investment to support bicycle and pedestrian travel. The Sustainable Communities Act of 2010, for example, was intended to facilitate such efforts. Other State agency funding programs that can support bicycle and pedestrian projects include the Maryland Heritage Areas Authority, Community Legacy Program, and Program Open Space. Many communities in Maryland have successfully used these funds to support bicycle and pedestrian projects. Additionally, federal agencies, including the US Department of Transportation, Environmental Protection Agency, Department of Housing and Community Development, and Department of Interior provide funding and technical assistance directly to communities that can support bicycle and pedestrian improvements.

Finally, Maryland can continue to learn from other communities about innovative approaches to bicycle and pedestrian funding. In Colorado, for example, recreational paths and trails are funded through stormwater management projects, due to their ability to help control runoff.[16] In Michigan, the Central Michigan District Health Department awarded grants to 13 municipalities through the "Together We Can Transform Communities Initiative." These funds will be used to create master plans for bicycle and pedestrian improvements.

Monitoring Performance

MDOT will monitor progress toward the goals of this Plan through several performance measures. MDOT reports agency performance annually through the Attainment Report, submitted to the General Assembly as part of the State Report on Transportation. In addition, SHA maintains a business plan with clearly defined goals, objectives, and performance measures. The Highway Safety Office also submits an annual report to the National Highway Traffic Safety Administration documenting safety performance and efforts. The performance measures establish trends over time that are used to evaluate progress and identify areas needing attention. Achieving these goals depends on the continuing commitment within MDOT and its modal administrations as well as critical partnerships with agencies at all levels of government.

The following performance measures are all quantitative, measurable metrics and important indicators for the Plan's goals. Some of these measures are currently tracked and

Innovative Approaches to Funding

The Environmental Protection Agency (EPA) and Chesapeake Bay Stewardship Fund provides technical assistance grants under the National Fish and Wildlife Foundation's (NFWF) Local Government Green Infrastructure Initiative. The grants, ranging from $100,000 to $150,000, are awarded to localities that use the money to reduce the amount of polluted runoff entering the Bay.

In July 2012, Cambridge, Maryland was awarded a $150,000 grant under the program. The City will integrate green infrastructure and innovative stormwater management into revitalization of two main thoroughfares that intersect with Route 50 and serve as the City's "main streets." The Project also will include pedestrian and bicycle improvements along with identification of priority opportunities to implement stormwater retrofits throughout the City.

reported, while others are new measures recommended to comprehensively measure progress toward the goals of this Plan. New recommended measures may take some time to begin tracking, as they may require collection and compilation of new data. New measures may be appropriate to include in the Attainment Report after their performance tracking is established. The currently established targets noted in the table are reviewed and updated periodically through MDOT's performance measurement processes. Targets for new measures will need to be set once tracking is established. Targets for all measures should help drive strong performance and efficiency, yet also be attainable based on available resources and constraints.

In addition to the annual performance measurement processes, MDOT will continue to engage and seek input from stakeholders regarding bicycle and pedestrian improvements. MDOT consults bi-monthly with the Maryland Bicycle and Pedestrian Advisory Committee. This group, appointed by the Governor, advises the state cabinet department on issues related to biking and walking, and is an important resource for monitoring progress toward the goals of this Plan. In addition, MDOT will continue efforts to seek project-based input from stakeholders and engage in local planning efforts to support bicycle and pedestrian improvements.

Finally, as directed by law, this Plan will be reviewed and updated every five years concurrent with each update of the MTP. These updates will provide opportunities to collect feedback from partners and stakeholders, incorporate new issues and priorities into the framework, and reflect progress and accomplishments at regular intervals.

Maryland Bicycle and Pedestrian Advisory Committee (MBPAC)

MBPAC advises state agencies on issues directly related to bicycling and pedestrian activity including funding, public awareness, safety and education.

The twenty-two member committee is appointed by the Governor, combining the experience of citizens with the expertise of representatives from eight State agencies and a regional planning agency. Citizen members reside in geographical regions throughout Maryland as well as represent specific constituencies such as persons with disabilities. Each member is appointed to serve on four subcommittees that focus on different aspects of biking and walking while engaging a wide variety of stakeholders. The subcommittees provide reports at each meeting and these reports provide valuable information to the committee.

Some of MBPAC's recent activities include:

- Provided input to MDOT and the Maryland Department of Education in the development of MDOT's Student Travel Policy Survey.
- Recommended adoption of Bicycles May Use Full Lane signs on State roadways to increase highway safety and bicyclist comfort.
- Provided input to the development of SHA's Bicycle Design Guidelines.Conducted safety and education programs for biking and walking including publishing a Bicycling Guide for Adults.
- Urged MVA to publicize the law requiring vehicles to pass bicycles by no less than a three foot clearance.
- Taking positions and offering recommendations on legislative proposals.
- Evaluating ways to eliminate obstructions on sidewalks along State highways and promoting establishment of shared use paths along utility rights-of-way.

MPBAC provides valuable input to MDOT and its business units regarding biking and walking matters, and supports sharing of information between state agencies, citizen organizations and individuals. For more information on the MBPAC please visit MDOT's website.

Performance Measures

New recommended measures are indicated with an asterisk. Measures recommended for reporting in the Annual Attainment Report are in bold text.

Goal	Measures	Performance Target
1. Build Connected Networks Expand walking and bicycling networks, remove barriers, and enhance connections with transit and travel destinations.	Number of sidewalk miles constructed and reconstructed along state owned roadways	2% annual increase in miles of sidewalks
	Percent reduction in sidewalk gaps along state owned roadways*	New measure, target to be set once data tracking is established
	Number of directional miles of state owned roadway with marked bicycle facilities (Data development is underway to allow tracking bike lanes, sharrows, and other separately)	2% annual increase in miles of marked bicycle facilities
	Number of miles of shared-use transportation trails constructed with state funding*	New measure, target to be set once data tracking is established
	Number of MTA and locally operated transit buses equipped with bike racks*	Maintain 100% core service buses equipped with bike racks
2. Improve Safety Enhance pedestrian and bicycle safety to reduce injuries and fatalities and to make walking and biking comfortable and inviting.	**Annual number of bicycle fatalities and injuries on all roads in Maryland**	< 3 fatalities per year by 2015 < 542 injuries per year by 2015
	Annual number of pedestrian fatalities and injuries on all roads in Maryland	< 92 fatalities per year by 2015 < 2,050 injuries per year by 2015
3. Plan and Design for Everyone Effectively balance the needs of all transportation users to promote travel choices, ensuring that bicyclists and pedestrian needs are prioritized in appropriate locations.	**Percent of state owned roadway with a bicycle level of comfort (BLOC) D or better**	80% of state road miles at BLOC D or better
	Percent of state owned roadway with a bicycle level of comfort (BLOC) C or better (Data development may allow further distinguishing within Short Trip Opportunity Areas, BPPAs and/or other appropriate place types and designated areas)*	New measure, target to be set once data tracking is established
	Percent of sidewalks along state owned roadways that are ADA compliant	2% annual increase in the percent of sidewalks that are ADA compliant
4. Strengthen Communities Partner with local governments to support walkable and bikeable communities and to achieve sustainability, livability, health, and economic benefits.	**Percent of state owned roadways within priority funding area with sidewalks or sidepaths. (As 2035 MTP and PlanMaryland place types, short trip opportunity areas and BPPAs are developed, this measure may change to measure sidewalks within one or more of those areas.)**	2% annual increase in miles of sidewalks within priority areas
	Percent of eligible state owned roadways within 1 mile of transit stations with sidewalks	Target to be set once data tracking is established
	Percent of eligible state owned roadways within 3 miles of transit stations with marked bicycle facilities (bicycle lane, sharrows and other separately)	Target to be set once data tracking is established
5. Promote Walking and Biking in Maryland Support walking and biking everyday modes of transportation and recreation through encouragement, marketing and information.	Number of bicycle and pedestrian trips counted on key indicator facilities*	New measure, target to be set once data tracking is established
	Bicycle and/or pedestrian related education and promotional materials distributed.	New measure, target to be set once data tracking is established

Endnotes

1 § 2-604 (b) of the Transportation Volume of the Annotated Code of Maryland states, "The Statewide 20-Year Bicycle-Pedestrian Master Plan shall be reviewed and updated each year that the Maryland Transportation Plan, as described in § 2-103.1 of this title, is revised."

2 Great Allegheny Passage. Trail Town Economic Impact Study. Accessed from http://www.atatrail.org/docs/GAP_Economic_Impact_Study_Phase1.pdf on May 13, 2013.

3 US Census Bureau, American Community Survey, Journey to work 2012 3-year estimate. US Census Bureau Transportation Planning Package, Journey to work, 2000.

4 Bicycling and Walking in the United States:2012 Benchmarking Report Facts Sheet. Accessed from http://www.peoplepoweredmovement.org/site/images/uploads/Media_Fact_Sheet_-_Benchmarking_2012.pdf on August 12, 2013.

5 Eligible State roadways exclude roads on which bicycles are prohibited, such as limited access freeways.

6 Priority Funding Areas were established by the 1997 Priority Funding Areas Act (the Smart Growth Act). The criteria for PFAs are defined in the Annotated Code of Maryland, State Finance and Procurement Article (SF&P), §5-7B-02 and §5-7B-03.

7 Great Allegheny Passage. Trail Town Economic Impact Study. Accessed from http://www.atatrail.org/docs/GAP_Economic_Impact_Study_Phase1.pdf on May 13, 2013.

8 Traffic crash data are traditionally collected by state or local police who respond to incidents. Bicycle and pedestrian crashes that do not involve a motor vehicle, are not reported to police or take place in locations other than public streets are not included in this data set. It should be noted that these data rely on local police reporting practices and a variety of factors can influence the accuracy crash reports. The data used for this analysis have limitations. Of the almost 8,000 bicycle crash records compiled in the Maryland Automated Accident Reporting System (MAARS), only 71 percent include data providing a geographic location that can be used for mapping. Because data describing overall levels of bicycle and pedestrian activity are not available, crash rates per trip cannot be calculated. As a result, it cannot be determined whether increases or decreases in crashes over time represents a change in crash rates or a change in overall activity levels.

9 Maryland Automated Accident Reporting System. Bicycle Crash Data 2006-2011.

10 National Highway Traffic Safety Administration's National Center for Statistics and Analysis, Traffic Safety Facts 2010 Data, August 2012. http://www-nrd.nhtsa.dot.gov/Pubs/811625.PDF

11 Maryland Automated Accident Reporting System. Pedestrian Crash Data 2006-2011.

12 Dill, Jennifer; Handy, Susan L; Pucher, John. How to Increase Bicycling for Daily Travel. Active Living Research. Research Brief. May 2013. Accessed from http://activelivingresearch.org/files/ALR_Brief_DailyBikeTravel_May2013.pdf on August 27, 2013.

13 21-1008(b) of the Transportation Volume of the Annotated Code of Maryland states, "When a public institution of higher education revises its facility master plan, the public institution of higher education shall address bicycle and pedestrian transportation circulation."

14 National Complete Streets Coalitions: Smart Growth America.

15 National Complete Streets Coalitions: Smart Growth America.

16 Boulder, Colorado's Greenways Program provides recreation and transportation opportunities along Boulder Creek and its 15 major tributaries (https://bouldercolorado.gov/water/greenways-program).

Maryland Department of Transportation

MARYLAND TWENTY-YEAR

BICYCLE & PEDESTRIAN MASTER PLAN

JANUARY 2014