



Anne Arundel County Pedestrian and Bicycle Master Plan:

# 2013 Plan Update

for Anne Arundel County Office of Planning and Zoning Transportation Division

This report is funded in part through a Federal Grant under the Unified Planning Work Program (UPWP) prepared for the Baltimore Regional Transportation Board.

**FINAL**

June 2013



## Executive Summary

The Anne Arundel County Office of Planning and Zoning (OPZ) has undertaken the task of updating the 2003 Pedestrian and Bicycle Master Plan. The purpose of the 2013 Pedestrian and Bicycle Master Plan (2013 PBMP) is to identify improvement opportunities which increase the potential for safe trip-making by walking and bicycling while diminishing the need for single-occupant vehicle (SOV) trips. While the 2003 Pedestrian and Bicycle Master Plan (2003 PBMP) focused upon pedestrian and bicycle improvements in targeted geographic improvement areas, the 2013 PBMP focuses on pedestrian and bicycle improvements which create transportation alternatives for Anne Arundel County residents within the urbanized areas. Funding for this planning effort was provided through the Baltimore Regional Transportation Board (BRTB) through the execution of a Federal grant under the Unified Planning Work Program (UPWP).

Improvement opportunities developed as part of the 2013 Master Plan include both infrastructure and non-infrastructure improvements. Infrastructure improvements include potential pedestrian and bicycle facility projects such as new sidewalks, bicycle lanes or shared-use path facilities. Non-infrastructure improvements include policy recommendations, strategic coordination with other agencies and jurisdictions, and safety and educational outreach.

**“Transportation alternatives”**  
refers to facilities which support non-motorized forms of transportation such as sidewalks, bicycle lanes and shared-use paths.

A key element of this plan, as opposed to the 2003 PBMP, is the identification of specific pedestrian and bicycle related infrastructure projects deemed credible of consideration for construction. Although the projects are stratified by a tier ranking system, it should be noted that all of the projects listed are worthy of advancement to the project development stage. The overriding intent in identifying these projects is the advancement to construction whenever an opportunity arises; be it through Federal/State funding, County Capital Project funding or as a condition of developmental approval. Proposed changes in County regulations introduced in this Plan, and if adopted, will also introduce the opportunity for construction of projects through the use of impact fees and/or off-site private construction mitigation projects. The opportunity to provide pedestrian and bicycle facilities in more densely populated areas of the County, in lieu of roadway improvements could further promote changes in travel behavior and mode use. The identification of these projects is essential to ultimately improving pedestrian and bicycle connectivity within the higher density/populated portions of Anne Arundel County.

The pedestrian and bicycle infrastructure recommendations were compiled from the previous Master Plan, Small Area Plans for the urbanized areas, Public Listening Sessions, input from the Project Management Team and Citizens Advisory Committee, and field visits. A list of Evaluation Criteria addressing **Service**, **Structure**, and through them, inherently addressing **Safety** concerns, was developed for use on each of the improvements. With the criteria and

associated prioritization process addressing the concerns of the areas where facilities were most needed due to concentrations of high potential pedestrian and bicyclist users (origins) as well as concentrations of dense activity zones (destinations), a total list of projects ordered by priority was developed. This list did not take into account construction costs as a part of the prioritization process as funding opportunities may arise from numerous sources. Projects were evaluated for their ability to enhance the overall network.

Non-infrastructure improvements were developed through the review of County documents, listening sessions, and “best practices” research from other municipalities around the region, identifying the policies, codes, and other efforts that have allowed them to successfully implement and evaluate pedestrian and bicycle facilities in the pursuit of a complete network.

The recommendations developed as part of the 2013 PBMP will be carried forward and included in the County’s Transportation Functional Master Plan. Efforts are currently underway for this comprehensive planning document focused on transportation with a targeted completion date of Fall, 2014. Other elements of the TFMP include the 2012 Corridor Growth Management Plan (CGMP), a Complete Streets Policy, and a Major Intersections and Important Facilities Study for the County.

The following tables provide a summary of recommendations included in the 2013 PBMP. **Tables ES-1 and ES-2** provide the overall number of infrastructure projects by Prioritization Tier and Small Planning Area. Projects are identified by ownership of the roadway along which the proposed project is located. The development and full description of Prioritization Tiers is discussed in detail in Chapter IV of the 2013 PBMP. **Figure ES-1** illustrates the Small Planning Area boundaries for Anne Arundel County.

Much of the Crownsville, Deale/Shadyside and South County Small Planning Areas are located outside of the Planned Water and/or Sewer Areas of the County (outside of the urbanized area) which makes them outside of the study area for the 2013 PBMP. While no specific projects have been identified in these areas, a number of countywide non-infrastructure recommendations and other implementation strategies are included which will facilitate pedestrian and bicycle improvements throughout the entire county.

**Table ES-1: Infrastructure Projects by Prioritization Tier**

Prioritization Tier	Number of County Projects	Number of State Projects	Total Number of Projects
Tier I	18	23	41
Tier II	39	34	73
Tier III	17	15	32

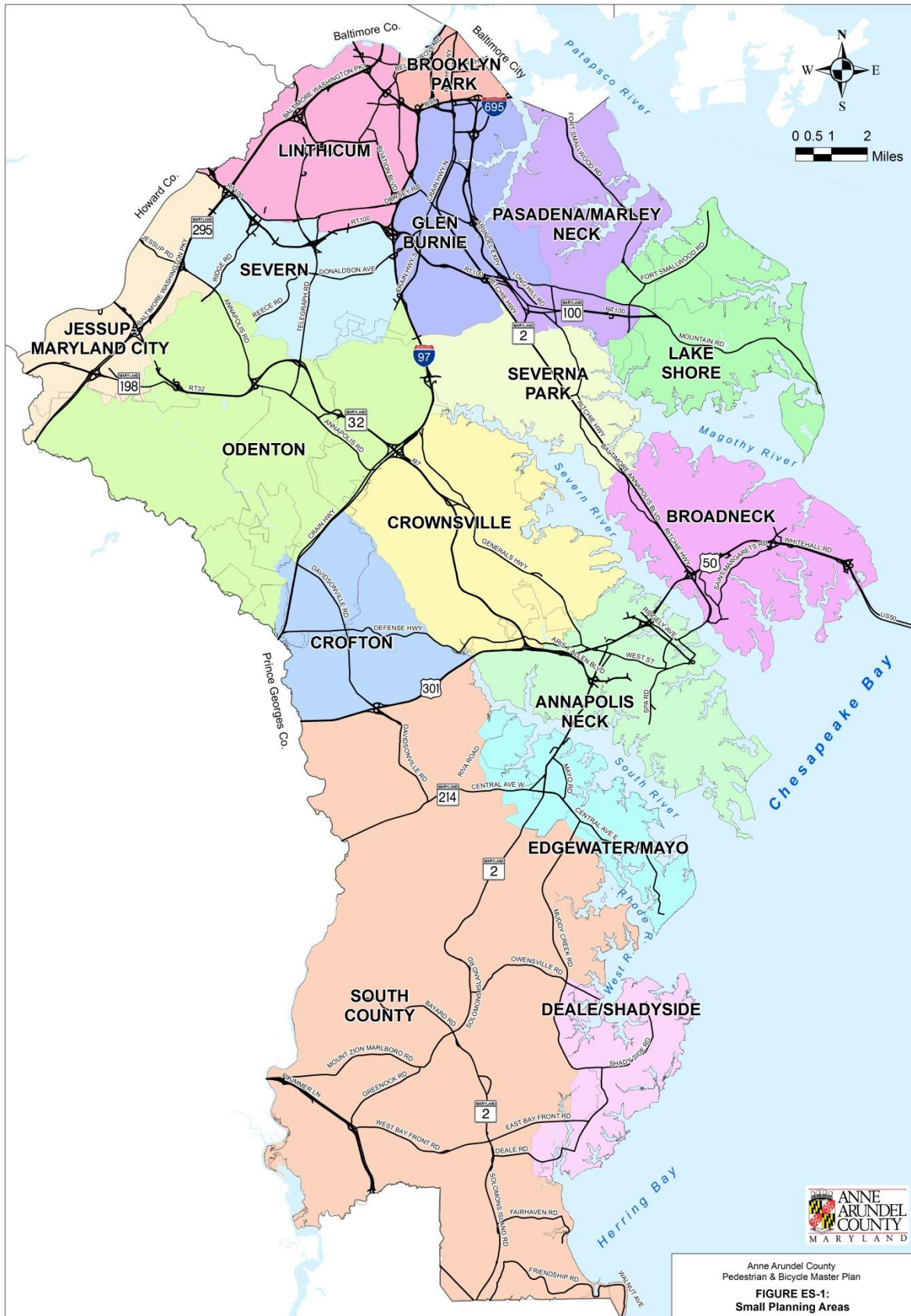
**Table ES-2: Infrastructure Projects by Small Planning Area**

Small Planning Area	# Projects		
	County Projects	State Projects	Total Projects
Annapolis Neck	11	8	19
Broadneck	16	4	20
Brooklyn Park	0	4	4
Crofton	1	4	5
Crownsville	0	0	0
Deale/Shadyside	0	0	0
Edgewater/Mayo	0	3	3
Glen Burnie	2	13	15
Jessup/Maryland City	0	5	5
Lake Shore	1	3	4
Linthicum	4	5	9
Odenton	18	5	23
Pasadena/Marley Neck	2	8	10
Severn	1	5	6
Severna Park	18	5	23
South County	0	0	0

An additional limiting factor for many roadways in the non-urbanized areas is their classification as “Scenic and Historic Roads”. Legislation protects the scenic and historic fabric of the landscape of Anne Arundel County through regulating development along designated Scenic and Historic Roads. Development along roads designated as “scenic and historic” is guided by legislation which the Office of Planning & Zoning uses while working closely with developers, engineers, and traffic planners to ensure that historic and scenic roads are preserved while maintaining applicable safety standards. Compliance with Scenic and Historic Roads regulations is managed by the Cultural Resources Program.

Scenic and Historic Roads are identified in Anne Arundel County on an official map maintained by the Office of Planning and Zoning and by Ordinance 21-06. Generally, the County is limited in its ability to modify the current roadway of those facilities identified as Scenic and Historic unless the change in the roadway is directly associated with a safety issue. Many of these roadways are low-volume, rural collector-type facilities, however, other roadways such as Solomon’s Island Road (MD 2), a principal arterial roadway connecting Annapolis with Calvert County and located south of Central Avenue, is also identified as Scenic and Historic. The designation can limit the County’s ability to add pedestrian and bicycle supporting infrastructure or design changes.

**Table ES-3** includes a summary of highlights from all recommendations within the 2013 PBMP.



## Table ES-3: Summary of Pedestrian and Bicycle Master Plan Highlights

<b>Infrastructure Recommendations</b>
Implement pedestrian and bicycle improvement projects throughout the County according to the projects identified in the 2013 Pedestrian and Bicycle Master Plan (2013 PBMP).
<b>Policy Recommendations</b>
<b>Design Manual</b>
Adopt a set of design guidelines for pedestrian and bicycle facilities for inclusion in the Design Manual.
Require a minimum clear width sidewalk of 5-feet for all County sidewalks.
Update the Standard Details for roadway typical sections to reflect the inclusion of different pedestrian and bicycle facility types (e.g. shared-use roadway, on-road bicycle lane, and shared-use path).
Update the Design Manual to refer to a Complete Streets Policy and Design Criteria for guidance designing roadway improvements to be safe efficient routes for travel by all modes.
<b>County Code</b>
<b>Subdivision and Development Regulations (Article 17)</b>
Update the General Provisions (Article 17 §2-102) to include a provision for the consideration of all modes of travel to include accessible pedestrian and bicycle facilities as viable transportation alternatives.
Update the Site Development Plan outlined in Article 17 §4-202 to include a more robust description of pedestrian and bicycle connectivity, including at the preliminary plan stage.
Incorporate pedestrian and bicycle facilities into Title 5 which discusses the need to include Adequate Public Facilities in accordance with “General Development Plan growth objectives” to ensure connection to the existing pedestrian and bicycle system and to connect the planned facilities in the appropriate width and with the proper grades and cross slopes.
Update Article 17 Subtitle 4 which discusses “Adequate Road Facilities” to include specific reference to pedestrian and bicycle facilities.
Include the establishment of a “Pedestrian/Bicycle Fee in Lieu of Construction” type program within Title 5 to create a County fund for use in implementing pedestrian and bicycle facilities.
Provide a strong clear discussion of the need to provide right-of-way and construction of Complete Streets with accessible pedestrian and bicycle facilities compliant with the Pedestrian and Bicycle Master Plan in Title 6, Article 17 §6-103 through a site development plan.
Amend Article 17 §11-209 to explicitly state that pedestrian and bicycle facilities fall within the eligible capital improvements which can be paid for through the use of impact fees.
<b>Zoning (Article 18)</b>
Amend Title 3 to include a requirement for bicycle parking as well as establishing the number of required bicycle parking spaces.

<b>Landscape Manual</b>
Include bicycle parking requirements for additional zoning districts.
Amend Section Q, Recreational Facilities, to include the provision of bicycle parking.
Include a list of approved and/or recommended bicycle parking types in the Appendices of the Manual.
<b>Complete Streets Policy</b>
Develop and adopt a Complete Streets Policy for Anne Arundel County to guide designers, developers and government officials in the implementation of roadways which include comfortable facilities for motorists, pedestrians, bicyclists and transit vehicles.
Integrate the Complete Streets Policy into the County Code, Subdivision and Development Regulations, Design Manual and Landscape Manual where appropriate to ensure that roadway projects and developments completed in the County provide the equitable inclusion of facilities for all modes at all stages of the planning, design and construction processes.
<b>Administrative</b>
Create a Pedestrian and Bicycle Coordinator permanent staff position within the department where it will be most effective. The overarching responsibility of the Pedestrian and Bicycle Coordinator should be to oversee the planning, prioritization, coordination and implementation of pedestrian and bicycle projects throughout the County.
<b>Facility Maintenance</b>
Include any roadway with a bicycle facility (shared-use roadway, shoulder or bicycle lane) on the County's Street Sweeping list.
Streamline facility maintenance requests from citizens through an online form available on the County website.
The Pedestrian and Bicycle Coordinator should complete field reviews of pedestrian and bicycle facilities in high use areas and in areas where issues have been reported by citizens.
Develop a maintenance process for shared-use facilities which addresses issues such as maintenance responsibility, hours of operation, funding, snow removal, staffing and equipment needs.
<b>Non-Infrastructure Recommendations</b>
<b>Education and Safety Programs</b>
Complete updates to the Basic Driving section of the Maryland Driver's Manual to increase awareness for pedestrians and bicyclists.
Continue to utilize education programming and funding available through Safe Routes to School.
Anne Arundel County Public Schools should adopt National Highway Traffic Safety Administration (NHTSA) Pedestrian Safety Curriculum as part of the school physical education curriculum.
Continue to coordinate with the Baltimore StreetSmart program for available partnership opportunities, resources, and events. Consider new partnerships specifically through the Office of Planning and Zoning with Baltimore StreetSmart.

<b>Crash Data</b>
Pedestrian and Bicycle Coordinator should coordinate with Anne Arundel County Police Department to gain access to crash reports involving pedestrians and bicyclists.
Create a database to manage and analyze crash reports using GIS or other Crash Data Software.
<b>Grass Roots Efforts</b>
Coordinate with existing bicycling and running/walking clubs to develop and promote programs to increase visibility in the community.
Consider the installation of bicycle parking at popular destinations such as shopping centers, employment centers, and transit stations.
Coordinate with Anne Arundel Economic Development Corporation to promote walking tours and bicycling tours of local tourist attractions.
<b>Implementation Recommendations</b>
<b>Implementation Plan</b>
Create an Implementation Plan to track the completion of the infrastructure and non-infrastructure recommendations of the 2013 Pedestrian and Bicycle Master Plan.
<b>Project Safety Audits</b>
Perform Project Safety Audits to identify countermeasures and further potential projects as they advance through future planning and development.
Refer to Federal Highway Administration's published guidelines for Pedestrian Road Safety Audits and Bicycle Road Safety Audits.
Coordinate with BRTB on potential involvement in upcoming walkability workshops and Road Safety Audits, and use of new materials currently under development.
<b>Coordination with Others</b>
Coordination efforts regarding policy and plan implementation should continue with the following entities and jurisdictions: Anne Arundel County Police Department, Baltimore County, Baltimore Regional Transportation Board (BRTB), City of Annapolis, City of Baltimore, Fort Meade, Howard County, Maryland Department of Transportation, Maryland State Highway Administration, Prince George's County.
<b>Funding Opportunities</b>
Apply for project funding through Federal Highway Administration's Moving Ahead for Progress in the 21 <sup>st</sup> Century (MAP-21) Act.
Continue to utilize State funding through Maryland Bikeways Program Grants.
Apply for funding available through the following State funds and programs: ADA Retrofit, Access to Transit, Sidewalk Retrofit, Bicycle Retrofit, Community Safety and Enhancement Program, Transportation Enhancement Program, Maryland Highway Safety Office Grant Programs.
Partner with local businesses and advocacy groups to raise funding for pedestrian and bicycle improvements.



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# I. Introduction

## A. Purpose

The Anne Arundel County Office of Planning and Zoning (OPZ) has undertaken the task of updating the 2003 Pedestrian and Bicycle Master Plan. The purpose of the 2013 Pedestrian and Bicycle Master Plan (2013 PBMP) is to identify improvement opportunities which increase the potential for safe trip-making by walking and bicycling while diminishing the need for single-occupant vehicle (SOV) trips. While the 2003 Pedestrian and Bicycle Master Plan (2003 PBMP) focused upon pedestrian and bicycle improvements in targeted geographic improvement areas, the 2013 PBMP focuses on pedestrian and bicycle improvements which create transportation alternatives for Anne Arundel County residents within the urbanized area.

A key component to creating viable transportation alternatives to increase the use of walking and bicycling as modes of transportation is the provision of facilities that are safe for users. This includes the feeling of safety as it applies to the personal security and comfort of the individual user as well as the physical condition of facilities. Opportunities to address safety of Anne Arundel County residents are considered throughout the 2013 PBMP.

**“Transportation alternatives”**  
refers to facilities which support  
non-motorized forms of  
transportation such as sidewalks,  
bicycle lanes and shared-use  
paths.

Additionally, transportation through walking and bicycling can offer additional benefits to County residents in the form of health benefits. The Anne Arundel County Department of Health recently completed several studies which document the overall “community health needs” as well as issues such as obesity.

Specific improvement opportunities developed as part of the 2013 PBMP include both infrastructure and non-infrastructure improvements. Infrastructure improvements include potential pedestrian and bicycle facility projects such as new sidewalks, bicycle lanes or shared-use path facilities. Non-infrastructure improvements include policy recommendations, strategic coordination with other agencies and jurisdictions, and safety and educational outreach.

The recommendations developed as part of the 2013 PBMP will be carried forward and included in the County’s Transportation Functional Master Plan (TFMP). Efforts are currently underway for this comprehensive planning document focused on transportation with a targeted completion date of Fall, 2014. Other elements of the TFMP include the 2012 Corridor Growth Management Plan (CGMP), a Complete Streets Policy, and a Major Intersections and Important Facilities Study for the County.

Note: A Glossary of Terms is provided in **Appendix A**.



## B. Study Area

The study area for the 2013 PBMP includes portions of Anne Arundel County which are:

- Within the County's current planned sewer and water service areas;
- Outside the City of Annapolis boundary; and
- Outside the Fort Meade boundary.

The study area is illustrated in **Figure 1**. Enlargements of countywide maps are located in **Appendix B**.

## C. Master Planning Process

### 1. Project Team

A Project Management Team (PMT) was assembled to ensure that all pertinent agencies and departments within the County were aware of the study, and providing information and feedback as needed to inform the study. Members of the PMT included:

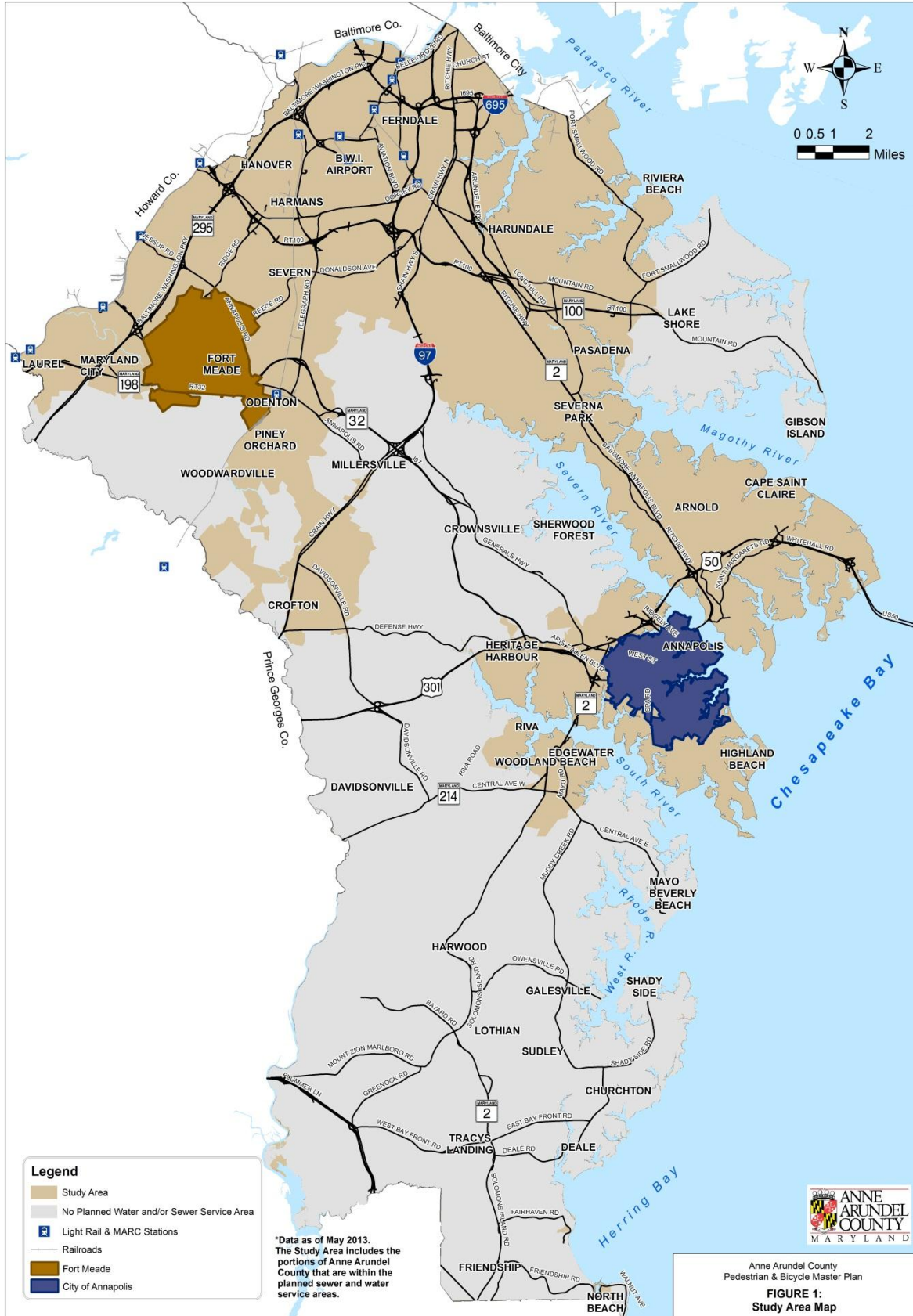
- Anne Arundel County Office of Planning and Zoning – **Lead Organization**
- Anne Arundel County Department of Health
- Anne Arundel County Department of Public Works
- Anne Arundel County Department of Recreation and Parks
- Anne Arundel County Police Department
- Anne Arundel County Public Schools
- Baltimore Metropolitan Council
- Central Maryland Regional Transit
- City of Annapolis
- Maryland State Highway Administration
- Maryland Transit Administration

### 2. Public Participation

Public participation was an integral component of the planning process for the 2013 PBMP. Members of the community were engaged to offer input on facilities for walking and bicycling in the County at a number of different public participation events or through committee involvement.

#### **Public Listening Sessions**

Three (3) listening sessions were held throughout various locations in the County which served as an opportunity through which citizens of Anne Arundel County could learn about the project and voice their opinions. Citizens were urged to bring their input to sessions regarding pedestrian and bicycle facilities of the County's suburban and urbanized areas within the planned water and sewer service area.



The listening sessions were set up as open forums. Citizens were encouraged to sign-in upon arrival and review the display boards which highlighted the project goals and project schedule. Several large display maps of the existing conditions were available for viewing. The maps divided the County into a northern and southern section, conveying the areas of the County that are in the study area.

Public Listening Sessions were held at the following locations:

Annapolis High School Cafeteria – January 31, 2012

A total of 29 community members were in attendance for this listening session. Popular discussion areas and ideas included connecting shopping areas with Downtown Annapolis, safety concerns, providing facilities in the vicinity of Anne Arundel Community College and the Naval Academy and the construction of the Broadneck and South Shore Trails.

Arundel Mills Mall Community Room – February 7, 2012

A total of seven community members were in attendance for this listening session. Popular discussion areas and ideas included improving access to Arundel Mills Mall, installing bicycle racks at Arundel Mills Mall, access to Fort Meade for bicycle commuters, the construction of the South Shore Trail, and the desire for a facility along Mountain Road.

Severna Park Middle School Cafeteria – February 22, 2012

A total of 28 community members were in attendance for this listening session. Popular discussion areas and ideas included pedestrian and bicycle facility improvements in the Severna Park and Pasadena areas, miscellaneous safety improvements and an interest in seeing a report card on the results of the recommendations from the 2003 Pedestrian and Bicycle Master Plan.

**Appendix C** includes comment cards from each of the listening sessions, as well as a compilation of notes compiled by the project team after each of the listening sessions.

### **Public Meetings**

A total of four (4) Public Meetings have been held for the 2013 PBMP. While the goal of the Public Listening Sessions was to introduce the project and solicit initial impressions and suggestions, the goal of the Public Meetings was to get input on specific Plan elements, while also offering an open forum for public comment.

The first three Public Meetings were held during the Summer of 2012 and focused upon the development of Evaluation Criteria. These meetings were held on:

- July 24, 2012 – Southern District Police Station
- July 31, 2012 – West County Library
- August 1, 2012 – North County Library



The final public meeting was held on June 11, 2013 at Broadneck High School in Annapolis. The meeting was an opportunity to allow the public to comment on the Draft Pedestrian and Bicycle Master Plan, specifically upon the list of potential projects. County staff also discussed the role of the 2013 PBMP in the overall transportation planning process as it pertains to the TFMP. There were 35 community members in attendance.

Comments were collected at the Public Meeting and for a period of one week following the meeting. Comments included potential new projects for consideration as well as potential general recommendations to improve walking and bicycling in Anne Arundel County. All new pedestrian and bicycle projects were summarized to be evaluated by County staff at a later date, for possible inclusion in the TFMP.

Since these projects were identified and incorporated after the publication of the initial draft of the 2013 PBMP, they are located in **Appendix S**.

### **Citizens Advisory Committee**

A Citizens Advisory Committee (CAC) was appointed by the County Executive to work with the Office of Planning and Zoning and the project consultant to provide ongoing citizen and community perspective for the Pedestrian and Bicycle Master Plan Update. CAC Meetings were held on the following dates:

- May 7, 2012
- August 7, 2012
- January 30, 2013

- April 10, 2013
- May 23, 2013

A copy of the Meeting Minutes from each of the Citizens Advisory Committee meetings is located in **Appendix D**.

### **3. Technical Memoranda**

A total of four (4) technical memoranda were prepared throughout the master planning process. Each of these documents provides a detailed account of important milestones in the assembly of the 2013 PBMP.

- Technical Memorandum 1: Existing Conditions
- Technical Memorandum 2: Evaluation Criteria
- Technical Memorandum 3: Identification and Ranking of Improvement Options
- Technical Memorandum 5: Policy

Note: The public participation element of the master planning process, including all outreach materials and mapping, constitutes “Technical Memorandum 4”.

## **D. Related Planning Documents**

### **1. Anne Arundel County General Development Plan (2009)**

Anne Arundel County’s 2009 General Development Plan (GDP) is a policy document formally adopted by the County Council under Bill No. 64-09 on October 19, 2009. The GDP is a comprehensive plan that establishes policies and recommendations to guide public facility decisions. The Plan is based on four core principles: balanced growth and sustainability, community preservation and enhancement, environmental stewardship, and quality public services. The 2009 GDP also included a Land Use Plan, a Transportation Plan, a proposed Priority Preservation Area section, a Water Resources Plan, a Concurrency Management Plan and an Implementation Plan. For the purpose of this Technical Memorandum the main research focus of the 2009 GDP was on *Chapter 9: The Transportation Plan*.

**The Transportation Plan** makes recommendations to improve the County’s road network, public transit options, and travel demand management.

Specifically, the County’s transportation planning approach focuses on seven key elements:

- Maintenance of the existing transportation facilities inventory to protect public investment in facilities and to support redevelopment and revitalization of the County’s neighborhoods and commercial areas;
- Expansion of the transportation facilities inventory to meet the increasing travel demand;
- Emphasis on improving safety for motorists, pedestrians, and bicyclists;
- Provision of alternative means of mobility through increased transit service;

- Implementation of travel demand management strategies;
- Inclusion of emergency management principles in transportation plans; and
- Expansion of pedestrian and bicycle facilities.

The Transportation Plan chapter discusses the multi-modes of transportation that exist within the County: the highway network, transit service, rideshare services, vanpool services, airports, and the pedestrian and bicycle network. The latter portion of the Transportation Plan makes recommendations for a transportation functional master plan, priority highway improvement corridors, transportation demand management strategies, and other related policies and actions.

### **The Highway Network**

This section of the Plan discusses the Functional Classification system, roadway design considerations, and roadway levels of service under the County's existing and future conditions. The Plan goes into further detail describing how roadway projects are identified and funded.

The Plan made the following roadway design recommendations:

- Update and revise the County's Design Manual and appropriate sections of the Subdivision Regulations to incorporate context sensitive design requirements to promote design and redesign of the County's roadways to be more compatible with the surrounding land uses and the GDP Land Use Plan.
- Establish street design criteria to the extent permitted by State law to support alternative transportation modes to better meet user needs and minimize conflicts between competing modes.

The Plan made the following recommendation related to roadway level of service (LOS):

- Establish LOS standards based on planned land uses and densities so that the LOS standard may be lower in town centers and urbanized areas where transit and other mobility options are available and higher in rural and less developed areas based on land use recommendations.

### **Transit Service**

In the County, transit is provided by both rail and bus services. State operated commuter and fixed route transit by the Maryland Transit Administration (MTA) and locally operated transit systems provided by the City of Annapolis Transit (AT) and by the Corridor Transportation Corporation (CTC) [since renamed Central Maryland Regional Transit (CMRT)]. Rail service in the County consists of the Light Rail Transit and the Maryland Rail Commuter System. Bus service in the County is provided by MTA, CMRT's Connect-A-Ride (CAR), and the Annapolis Transit.

The GDP Transportation Plan made the following recommendations related to transit service:

- Combine management of fixed route County-operated services with the fixed route, demand-response and specialized transit operated by the Department of Aging and Disabilities.
- Extend the Baltimore Light Rail Yellow Line from the BWI Business Park Station to the Dorsey MARC Station.
- Improve accessibility to MARC stations by adding a Penn Line station, road access, parking, pedestrian/bicycle facilities, and bus transit connections.
- Implement the recommendations for bus transit found in the Transit Development Plan and provide the landside infrastructure (sidewalks, street lighting, bicycle racks, park and ride lots, and pedestrian safety improvements) necessary to promote transit use.
- Consolidate transit activities under a single agency to promote coordination of services and reduce confusion among existing and potential users.
- Obtain the capital assets necessary to operate fixed route and demand-response bus transit. Sources could be impact fees, utility fees, and bonds.
- Evaluate possible revisions to the impact fee regulations to allow the fees to be used for transit-related projects.
- Facilitate development in the vicinity of existing and planned transit nodes through improved access; focusing growth in areas served by existing or planned transit; encouraging improved access, increasing parking availability, and providing feeder bus service between rail stations and employment areas; and promoting development and revitalization areas that are in scale with the transit provided.
- Identify and, to the extent feasible by law, protect the alignment of the Yellow Line of the Baltimore Central Light Rail Line from BWI Airport to the Dorsey MARC Station.
- Complete a MARC station feasibility study in the vicinity of MD 100 along the Penn Line to promote the location of a new station where additional access to the line would be possible.

### **Rideshare, Car and Vanpooling**

The County has one of the state's largest work forces and there is a constant increase in travel demand, which creates congestion on both highway and transit networks if the demand is not effectively managed. There are two private associations that administer and promote rideshare, car and vanpooling in the County, The Annapolis Regional Transportation Management Association (ARTMA) and Baltimore/Washington International Business Partnership (BWIP).

The Plan recommended the following actions to meet the demands for commuter transportation programs and services:

- Continue to promote rideshare, carpooling, and vanpooling strategies to support transit use and offer options beyond the use of single occupant automobiles for mobility.

- Increase employer and resident awareness of rideshare programs, strategies, and opportunities.
- Require use of TDM strategies to reduce vehicle trips generated by new development as a condition of mitigation.

### **Airports**

The County has two publicly owned airports: BWI Thurgood Marshall International Airport and Tipton Airport.

The Plan made the following recommendations for air service:

- Accessibility to airports provided by surface transportation facilities should be maintained, and as necessary, improved to protect the competitiveness of these facilities that support the County's economic development. Accessibility improvements should include transit and pedestrian/bicycle facilities as well as highway capacity increases.
- Land uses near the airports should be monitored to prevent the compromise of the operations of these necessary facilities.

### **Pedestrian and Bicycle Network**

The Plan discussed the *2003 Anne Arundel County Pedestrian and Bicycle Master Plan*. The goal of the Plan was to encourage the integration of bicycle and pedestrian facilities into the roadway design and development review process. Specifically, the Plan identified pedestrian/bicycle facility corridor locations that required improvements such as sidewalks, street lighting, pedestrian ramps and crosswalks to better support pedestrian activity. There are approximately 30 miles of existing multi-use trails in the County and with more than one third of all travel in the County being less than two miles, improving the bicycle and pedestrian network is a goal of the County.

### **Mobile Source Air Quality**

Transportation produces an overall impact on the quality of the County's ambient air. Anne Arundel County is a participating member of the Baltimore Regional Transportation Board (BRTB). The BRTB has a Federal requirement under the Clean Air Act Amendments of 1990 and the Transportation Reauthorization legislation to ensure federal air quality standards are maintained for federally funded transportation projects in the Baltimore region. Therefore, the federally funded transportation projects, which are identified in the Baltimore Region's Long Range Plan, must meet the Federal air quality standards and demonstrate that these projects do not promote a further degradation of the Region's ambient air quality. Anne Arundel County has several projects that improve air quality in the Long Range Plan.

Recommendations related to the mobile source air quality from the Plan are as follows:

- Initiate an "awareness" program to make the employers, residents and County employees aware of Transportation Demand Management (TDM) services.



- Consider and implement specific cost effective programs for County employees where they are appropriate, such as priority parking spaces for carpoolers, subsidizing transit passes, flexible work schedules, and telecommuting.
- Review the County's existing practices regarding generation of emissions and adopt strategies to reduce emissions. These should include purchasing vehicles that are fuel efficient and produce lower rates of emissions, and providing information to employees about fuel conservation.
- Review existing land use codes and regulations and provide incentives for development that reduces the number of vehicle trips, where feasible.
- Identify larger private sector employers (over 100 full time employees) and work with them to implement TDM programs through ARTMA and BWI Business Partnership.
- Prepare a comprehensive study of Park and Ride lots to assess their usage, future demand, condition, and improvements needed to increase their usage for both ridesharing and transit.

Source: <http://www.aacounty.org/PlanZone/LongRange/GDP.cfm>

## **2. Anne Arundel County Pedestrian and Bicycle Master Plan (2003)**

Anne Arundel County completed a Pedestrian and Bicycle Master Plan in January 2003 (2003 PBMP) which was adopted by Bill No. 2-03. The goal of the Plan was to encourage the integration of bicycle and pedestrian facilities into the roadway design and development review process. Specifically, the Plan identified pedestrian/bicycle facility corridor locations that required improvements such as sidewalks, street lighting, pedestrian ramps and crosswalks to better support pedestrian activity.

## **3. Anne Arundel County Small Area Plans**

Anne Arundel County adopted 16 Small Planning Areas as part of the 1997 General Development Plan in recognition of the unique character of the County's different communities. Along with the creation of the area boundaries was the recommendation to develop detailed community-based land use plans for each area. Plans were completed and adopted by the County over a period of several years, with all plans being adopted by 2004. While the 2009 General Development Plan supersedes the Small Area Plans in some aspects, the Office of Planning and Zoning and other agencies refer to the Small Area Plans when conducting design studies, corridor studies, code revisions, capital project programming and development reviews.

## **4. Baltimore Regional Transportation Board (BRTB) Access to Rail Stations in the Baltimore Region (2011)**

The BRTB Access to Rail Stations in the Baltimore Region Project was completed in order to conduct an inventory and analysis of the bicycle and pedestrian facilities in the vicinity of rail stations in the Baltimore region. The project also included the development of recommendations and cost estimates for the recommended improvements.

## Trails

The Baltimore & Annapolis Hiker Biker Trail (B&A) extends 13.3 miles along the former Baltimore and Annapolis Railroad line from Annapolis to Glen Burnie. The BWI Trail connects to the B&A Trail in Glen Burnie and circles BWI airport for an additional 12.5 miles. The Washington, Baltimore, and Annapolis (WB&A) Trail Park extends 3.8 miles in Odenton and is accessible from the Odenton MARC Station.

## MARC Penn Line

BWI Marshall Airport MARC Station is surrounded by land classified with Industrial and Natural Features land uses. It is designated as a business growth area with mostly airport-related land uses. There are two parking structures available for use that provide 3,187 total spaces with an 80% occupancy rate. Pedestrian accommodations are not extensive, but there is a trail that provides access to a nearby business park. There are 16 bicycle lockers provided, most of which are rented; there are no bicycle racks provided. From 2007-2009, there was one pedestrian related crash within 0.6 miles, and no bicycle-related crashes within 3 miles of the station.

- Pedestrian accommodations are adequate since there are few origins for pedestrians within walking distance.
- Bicycle Route signage is recommended on MD 170 between Minnetonka Road and MD 100 to support shoulder usage.

Odenton MARC Station is surrounded by land classified with Town Center and Medium Density Residential land uses. Parking lots are being developed as part of the Odenton Town Center TOD project, and the new development is planned to have walkable connections to the station. There are more than 2,000 parking spaces provided, with a 100% occupancy rate. There are adequate pedestrian accommodations, but some improvements are recommended as it develops into a mixed-use area. There are bicycle racks and 10 bicycle lockers that are utilized at the station. From 2007-2009, there were 3 pedestrian-related crashes within 0.6 miles, and 15 bicycle-related crashes within 3 miles of the station.

- Some of the recommended pedestrian improvements are expected to occur as part of the TOD project.
- Share the Road signage, markings, and compatible drainage are recommended to support shared use lanes for segments of MD 170, MD 175, MD 174, and Odenton Road.
- Signage and some markings are recommended to support shoulder usage for bicycles along Gambrills Road, MD 170 and MD 32.

## MARC Camden Line

Laurel Park MARC Station (physically located in Howard County) is in an area designated as Government Institutional land use. There are 700 parking spaces

provided in the area for the Laurel Racetrack with a 2% occupancy rate. The station is located at the race track, and surrounding pedestrian accommodations are not adequate. There are no existing bicycle routes leading to the station. Area roads are wide enough to accommodate bicycle lanes and there are plans for future bicycle routes in the area. From 2007-2009, there were 3 pedestrian-related crashes within 0.6 miles, and 6 bicycle-related crashes within 3 miles of the station.

- Segments of sidewalk are missing on 1st Street.
- Crosswalks and some ramps are missing in the vicinity of the intersections of Main Street and 1st Street, and Main Street and 2nd Street.
- The station is not easy to find. Wayfinding signage is recommended along Laurel Fort Meade Road, 2nd Street, Fort Meade Road, and Washington Boulevard.
- The State of Maryland's FY 11-16 CTP includes funding for a project planning study of US 1 from Prince George's County to Baltimore County. The proposed improvement is to be consistent with Howard County's vision for improving safety and mobility.
- Share the Road signage and markings are recommended on many roads in the vicinity of the station to support shared use lanes. Additionally, bicycle compatible drainage is needed on MD 198 and Whiskey Bottom Road.
- Bicycle Route signage is recommended to support shoulder bicycle lanes on Brock Bridge Road and MD 198.
- Signage and markings are recommended to support the bicycle lane on MD 198 from the County line to Van Dusen Road.

### **Light Rail Stations**

Nursery Road Light Rail Station is located in northern Anne Arundel County and is in an area classified with Residential Medium Density and Natural Features land uses. There are 37 parking spaces provided in a surface lot with an 86% occupancy rate. There are no bicycle racks or lockers provided, and no marked bicycle lanes were observed in the area. From 2007-2009, there were 9 pedestrian-related crashes within 0.6 miles, and 4 bicycle-related crashes within 3 miles of the station.

- Sidewalks are missing along sections of Nursery Road, Old Annapolis Road and Hoffman Avenue.
- Crosswalks are recommended for Baltimore Annapolis Boulevard at Nursery Road, Berlin Avenue at Gibbons Avenue, and Gibbons Avenue at Shenandoah Avenue.
- Street lighting is recommended for the bus stop at B&A Boulevard at Nursery Road.
- Signage is needed to designate shoulder use by bicycles on Nursery Road from Wedeman Avenue to Colonial Drive.
- Bicycle signage and markings are recommended for Hammonds Ferry Road, Hollins Ferry Road, MD 648, and Nursery Road.

- Bicycle compatible drainage is needed along Gibbons Avenue and portions of MD 648.

North Linthicum Light Rail Station is in an area classified with Residential Medium Density and Commercial land uses. There are 347 parking spaces provided with an observed occupancy rate of 76%. There are 2 bicycle racks provided at the station, and Share the Road signage is posted on Camp Meade Road. From 2007-2009, there were 3 pedestrian-related crashes within 0.6 miles, and 1 bicycle-related crash within 3 miles of the station

- There are several gaps in the sidewalk along State and county roads.
- Faded or missing crosswalks should be replaced within the station to provide pedestrian paths. Pedestrian crossing signs should be placed at the railroad crossing.
- Crosswalk repainting is needed at the intersection of Camp Meade Road and B&A Boulevard.
- Bicycle signage is recommended along MD 170 between 10th Avenue and 6th Avenue to support shoulder use.
- Restriping, signing and markings are recommended for MD 170 from 6th Avenue to Potee Street to support shared use lanes.
- Bicycle signage and markings are recommended for portions of MD 171, MD 2, and MD 648.

Linthicum Light Rail Station is in an area classified as a Residential Medium Density land use area. There is no parking provided. There are no bicycle racks or lockers provided at the station. From 2007-2009 there were no pedestrian-related crashes within 0.6 miles, and 3 bicycle-related crashes within 3 miles of the station.

- There are a few short segments of missing sidewalks to be added.
- Wayfinding signage is recommended on Camp Meade Road.
- Bicycle recommendations are the same as North Linthicum Light Rail Station.

Ferndale Light Rail Station is in an area classified as a Residential Medium Density land use area. There is no parking provided at the station, and there is a sign advising customers not to park at the station. From 2007-2009, there were 6 pedestrian-related crashes within 0.6 miles, and 3 bicycle-related crashes within 3 miles of the station.

- There are segments of missing / damaged sidewalk along B&A Boulevard that should be replaced. There is also a tree along the Boulevard that needs to be removed.
- Bicycle signage and markings are needed to support shoulder use along MD 648 and MD 710.
- Share the Road signage and markings are recommended to accommodate shared-use lanes along several roads: Broadview Boulevard, MD 2, and West Furnace Branch Road.

Cromwell / Glen Burnie Light Rail Station is in an area classified with Industrial and Government/Institutional land uses. There are 795 parking spaces provided in a surface lot with an observed occupancy of 19%. Bicycle racks and lockers are provided but are underutilized and not highly visible. From 2007-2009 there were 8 pedestrian-related crashes within 0.6 miles, and 33 bicycle-related crashes within 3 miles of the station.

- Missing sidewalks, crosswalks and pedestrian crossing signs should be provided in the vicinity of the station.
- Pedestrian pathways / crosswalks are needed within the station site to create safe areas.
- A pedestrian signal and crosswalk is recommended for the intersection of B&A Boulevard and Dorsey Road.
- Bicycle signage is recommended to support shoulder use of MD 162 and Governor Ritchie Highway.
- Bicycle signage and markings are recommended to support shared-use lanes on Aquahart Road, Greenway SE Street, MD 176, and MD 3. This may help reduce crashes.

BWI Business District Light Rail Station is in an area classified with Industrial and Government/Institutional land uses. There are 36 spaces provided and a 58% occupancy rate was observed. The BWI Hiker/Biker trail connects the station with the B&A Trail to the south. There were no pedestrian or bicycle related crashes from 2007-2009.

- A designated pedestrian path with crosswalks is recommended within the parking area.
- Bicycle signage and markings are recommended for segments of Nursery Road, MD 170, and MD 162 to support shoulder usage.

BWI Thurgood Marshall Airport Light Rail Station is in an area classified as Government/Institutional land use. No parking is provided for light rail, although short and long-term parking is located at the airport. The station is accessible by foot from the airport terminal. From 2007-2009, there were 6 pedestrian-related crashes, and 1 bicycle-related crash near the station.

- Pedestrian crossing signs are recommended from airport parking to the station.
- Wayfinding signage to the station could be improved.
- Bicycling to the airport terminal or the light rail station is not advisable. Bicyclists should use the BWI Business District Station for access to the Light Rail.

Source: <http://www.baltometro.org/publications/pedestrian-and-bicycle-access-to-rail-stations>

## **5. City of Annapolis Bicycle Master Plan (2011)**

This plan was developed by the City of Annapolis as the first step towards realizing a goal set out in the 2009 Annapolis Comprehensive Plan to earn a Bronze Level Bicycle

Friendly Community award from the League of American Bicyclists by 2012, and to be named a Silver Level Community by 2016. In order to achieve this, the plan outlines five (5) goals, which are to establish:

1. A lasting bicycle transportation program integrated with Anne Arundel County and the State of Maryland
2. Ongoing programs for bicycle safety, education, and encouragement
3. A convenient and attractive network of on-street and off-street bicycle routes for all abilities, ages, and skill levels
4. Connections to other modes of transportation
5. A financial plan for construction, maintenance, and programming

The existing attitude towards bicyclists in Annapolis is favorable, and bicycling is emerging as a viable year-round form of transportation; however, conditions of both on-street and off-street facilities for bicyclists in Annapolis are limited and disconnected. Four (4) primary routes and connections were identified to focus on in order to expand and improve the bicycle network:

- Poplar Trail: City Dock to the Annapolis Mall
- Spa Creek Trail: neighborhood and trail route connecting City Dock to Parole Town Center
- West Annapolis/Hilltop/Bay Ridge Loop
- Forest Trail: a separated trail along the entire southern edge of Forest Drive

The plan outlines in detail a number of recommendations for the City to improve their policy, program, and infrastructure. Implementation of these recommendations is split into three phases with the intention of having all recommended improvements implemented over the next decade.

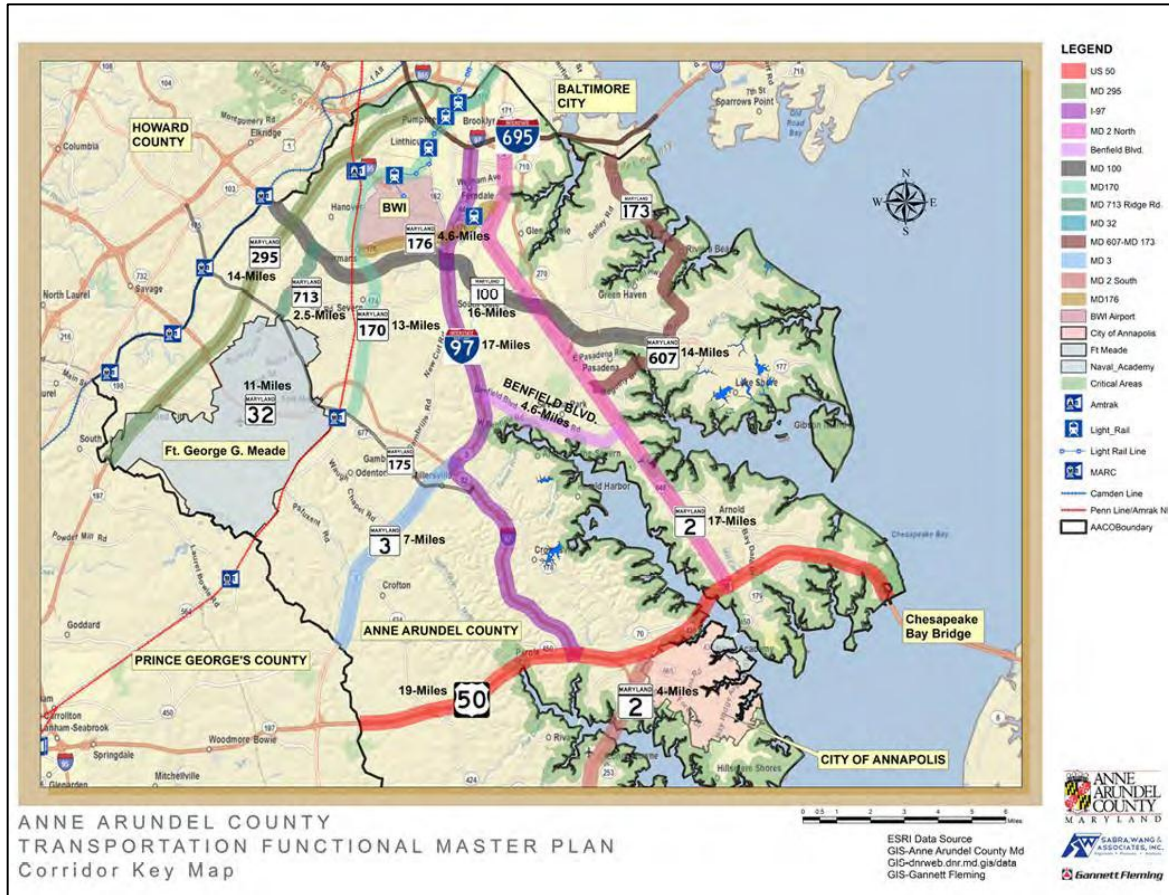
The recommended infrastructure facility improvements as laid out by this plan total 36.1 miles. The cost estimates do not include ongoing maintenance needs. Various possible funding sources are laid out, both local and State/federal, that could be used to support the implementation of the plan's recommendations.

Source: [http://www.ci.annapolis.md.us/BikeAnnapolis/Annapolis\\_BicycleMasterPlan-2011\\_FINAL.pdf](http://www.ci.annapolis.md.us/BikeAnnapolis/Annapolis_BicycleMasterPlan-2011_FINAL.pdf)

## **6. Corridor Growth Management Plan (2012)**

This study was conducted under the direction of the Office of Planning and Zoning. The purpose of this study was to analyze the transportation options along the busiest corridors in Anne Arundel County. The County is currently experiencing growth in both population and employment which is expected to continue over the next 20 years; accordingly, travel demand is also expected to increase. The study is proposing “to develop transportation solutions for viable alternative modes of travel, with concept-level impacts and costs.”

Thirteen highway corridors were studied in the CGMP. The first nine corridors are the most highly traveled roadways in the County, while the last four secondary corridors are important connector roads. The thirteen corridors are listed below and are illustrated in **Figure 2**:



**Figure 2: Corridors Included in the CGMP**

Nine Key Corridors:

1. US 50: Prince George's County Line to the Chesapeake Bay Bridge - 19 miles of limited access highway. No pedestrians or bicycles are allowed.
2. MD 2 North: US 50 to I-695 (17 miles) - Proposing new sidewalks on both sides of the roadway.
3. MD 2 South: Central Avenue (MD 214) to West Street (MD 450) (4 miles) – Add missing sidewalks and bicycle lanes where feasible.
4. I-97: US 50 to I-695 (17 miles) - No pedestrians or bicycles are allowed on this freeway.
5. MD 32: I-97 to the Howard County Line (11 miles) – No additional pedestrian or bicycle improvements are proposed.

6. MD 100: MD 648 to Howard County Line (5 miles) – No pedestrians or bicycles are allowed on this freeway.
7. Baltimore-Washington Parkway / MD 295: Prince George's County Line to I-695 (14 miles) – No pedestrians or bicycles are permitted on this highway.
8. MD 3: Prince George's County Line to MD 32 (7 miles) – A new sidewalk and trail are being constructed between MD 450 and MD 32.
9. Magothy Bridge Road to Hog Neck Road (MD 607) to Ft. Smallwood Road (MD 173) to the Baltimore City Line (14 miles) – New sidewalks are proposed and a feasibility evaluation for bicycle lanes or signed routes along the corridor will be conducted.

Secondary Corridors:

10. Benfield Boulevard: I-97 to MD 2 – The cross-section is proposed to be improved to accommodate bicyclists and pedestrians.
11. MD 176 (Dorsey Road): MD 179 to MD 2 – Both sidewalks and bicycle lanes/signed routes need improvements.
12. MD 170: MD 2 to MD 175 – Roadway widening and transit stop upgrades.
13. Ridge Road (MD 713): MD 176 to MD 175 – Both bicycle and pedestrian facilities need improvements.

**7. Maryland Department of Transportation (MDOT) 20-Year Bicycle & Pedestrian Access Master Plan (2002)**

The MDOT 20 Year Bicycle & Pedestrian Access Master Plan was a statewide project intended to identify and address bicycle and pedestrian needs for all road and bridge projects with the exception of interstates and freeways. The primary goal of the Plan was to:

“Integrate and expand the State’s bicycle and pedestrian facilities, creating a connected network of on-road, off-road and transit-related accommodations that will encourage and facilitate increased levels of bicycling and walking and improve access for individuals with disabilities.”

The master plan was created with 5 goals in mind. These goals include: Facility Integration and Expansion, Facility Preservation and Maintenance, Safety, Education and Encouragement, and Smart Growth. The Plan outlines an implementation schedule and cost estimate for each of the five goals. The plan also addresses performance measures for pedestrian and bicycle travel to be evaluated.

Current bicycle conditions were analyzed using the Bicycle Level of Comfort (BLOC) model, which is used by agencies throughout North America. The BLOC model is an evaluation of bicyclists’ perceived safety with respect to motor vehicle traffic. The model considers factors such as roadway width, bicycle lane widths and striping combinations, traffic volume, pavement surface conditions, motor vehicle speed and type, and



presence or absence of on-street parking. All 4,750 miles of State maintained roadways were analyzed in 2002 and given a grade from A to F.

**Table 1: Statewide and District 5 BLOC Distribution**

BLOC	Statewide (%)	District 5 (%)
A	22.8	27.2
B	15.2	13.7
C	17.5	20.7
D	19.6	20.5
E	13.8	10.7
F	11.1	7.3

**Table 1** shows the percentage of SHA maintained roads statewide and within District 5 that achieved each grade from the BLOC model.

In order to select which locations have the greatest needs for bicycle/pedestrian improvements, MDOT developed two tiers of needs for further review and consideration. Tier 1 roadways exhibit the greatest need for bicycle/pedestrian accommodations, whereas roadways in Tier 2 show less need.

**Tier 1** routes meet all three of the following criteria:

1. The road segment is recommended for improvement by the local government in a local/regional bicycle and/or pedestrian plan;
2. The road segment is within a Priority Funding Area (PFA);
3. The road segment has a Bicycle Level of Comfort of “E” or “F”.

**Tier 2** routes meet at least one of the following criteria:

1. The road segment is recommended for improvement by the local government in a local/regional bicycle and/or pedestrian plan;
2. The road segment has a Bicycle Level of Comfort of “E” or “F”.

After completing the analysis, it was determined that there are 30.42 miles and 192.20 miles of Tier 1 routes and Tier 2 routes, respectively, in Anne Arundel County. These listings do not include bridge structures.

The Tier 1 routes in Anne Arundel County include approximately 10.82 miles of MD 2 (Solomons Island Road), 1.97 miles of MD 3 (Crain Highway), 0.45 miles of MD 162 (Aviation Boulevard), 0.78 miles of MD 174 (Reece Road), 2.67 miles of MD 175 (Annapolis Road), 1.23 miles of MD 176 (Dorsey Road), 3.86 miles of MD 177 (Mountain Road), 1.71 miles of MD 387 (Spa Road), 0.88 miles of MD 424 (Davidsonville Road), 1.14 miles of MD 435 (Taylor Avenue), 4.17 miles of MD 450 (Defense Highway), 0.19

miles of MD 648 (Baltimore-Annapolis Boulevard), and 0.55 miles of MD 710 (East Ordnance Road).

For a complete listing of all recommended Tier 1 and Tier 2 pedestrian and bicycle improvement locations throughout Anne Arundel County, please reference **Appendix E** for a break down by location, distance (miles), BLOC grade, and PFA. This appendix is the District 5 excerpt from the *Bicycle and Pedestrian Needs Inventory Technical Appendix* of the *MDOT 20 Year Bicycle Pedestrian Access Master Plan*.

The Plan also lists a number of additional locations that were provided by local jurisdictions where accessible sidewalks and/or crossing improvements are needed. In Anne Arundel County, these locations include:

- Jennifer Road from MD 450 (West Street) to Medical Parkway
- Forest Drive from Riva Road to Chinquapin Round Road
- Solomons Island Road between Central Avenue and Mayo Road
- College Parkway and Governor Ritchie Highway connections to the B&A Trail
- Intersection of McKinsey Road and Governor Ritchie Highway
- Crain Highway between Davidsonville Road and Defense Highway
- Annapolis Road connections to MARC and proposed Town Center in Odenton
- Intersection of Fort Smallwood Road and Bar Harbor Road
- Intersection of Dorsey Road and Baltimore & Annapolis Boulevard
- Intersection of Hammonds Ferry Road and Nursery Road
- Intersection of Dorsey Road and Aviation Boulevard
- Intersection of Laurel Fort Meade Road (MD 198) and Corridor/Russett Green East Road
- West Street between Solomons Island Road and Riva Road
- Multiple intersections and corridors along Generals Highway, Defense Highway, West Street, and Bestgate Road near the town of Parole.

MDOT is currently in the process of updating the statewide Bicycle & Pedestrian Master Plan and plans to complete the updated plan by January 2014.

Source: <http://www.mdot.maryland.gov/.../FINALB.PDF>

## **8. Parole Pedestrian-Bicycle Plan (1999)**

This plan was developed for Parole Town Center with the goal of making Parole accessible and attractive to pedestrians and bicyclists. The specific objectives for this plan were as follows:

- Create safe, attractive, and prominent routes to walk and bicycle throughout Parole

- Improve overall movement and traffic circulation by increasing opportunities for pedestrian and bicycle movement, diverting trips from roads and contributing to travel demand management
- Create a pedestrian-bicycle circulation system that links with regional pedestrian-bicycle routes
- Connect Parole's subareas via a pedestrian-bicycle circulation network that incorporates unifying design themes and elements, thus helping create a sense of place and community, and improving the area's image
- Create a system of trails, paths, and sidewalks that will be an amenity and a community asset
- Connect the pedestrian-bicycle network with open spaces to create a recreational amenity

The existing bicycle and pedestrian facilities were inhibited due to the fact that eight major highways converge in Parole, dividing it into three sub-areas. A lack of safe, attractive ways to cross the arterial road network and move from one sub-area to another limits the existing pedestrian-bicycle circulation. Additionally, amenities such as bicycle storage facilities and rest areas were lacking in the town center's employment, retail, and service destinations.

Existing and proposed bicycle and pedestrian facilities were identified as either primary or secondary routes, based on estimated usage. Primary routes were to be distinguished from other routes by special design elements and other special accommodations. Improvements to all facilities were classified as High, Medium, or Low priority. These priorities were based on their potential to significantly improve pedestrian and bicycle circulation in Parole.

The plan designated a total of 57 separate projects that would be needed to implement the plan. At the time, 14 of those were already in the planning or design process.

The plan included recommendations for next steps, which were as follows:

1. Obtain public input to the draft plan. This should include the Parole Growth Management Committee.
2. Attend to the 14 identified Key Projects. These require immediate attention to ensure a pedestrian-bicycle component is included in the plans for construction.
3. Develop consensus on the plan's Design Considerations (Section 5.2) especially adjustments to Department of Public Works standard cross section and paving details. This should include consideration of consistency of the recommendations with:
  - The American Association of Highway and Transportation Officials (AASHTO) Guide to the Development of Bicycle Facilities.
  - Federal Highway Administration Report Selecting Roadway Design Treatments to Accommodate Bicycles.

- Federal Highway Administration’s Manual on Uniform Traffic Control Devices (MUTCD).
4. Adopt the plan so it can be used formally in the development review process, and as input into the County Capital Improvement Program.
  5. Develop an implementation plan for the other projects based on priorities identified in the project descriptions. This should include coordination with the City of Annapolis on projects requiring joint action.

Source: <http://www.aacounty.org/PlanZone/MasterPlans/ParoleCenter/index.cfm>

## **9. Staples Corner Urban Design Study (2009)**

This study was conducted under the direction of the Office of Planning and Zoning to create an Urban Design Concept Plan for the Staples Corner area near Crofton in Anne Arundel County. A previously adopted Small Area Plan for Crofton identified a desire to “establish Staples Corner as a destination that serves as a local activity center and creates an attractive gateway to Crofton.” The study area includes a small commercial hub and two principal intersections: MD 424/MD 450 and MD 424/Underwood Road.

The two most challenging issues in the study area were identified as traffic congestion and safety. Existing traffic conditions were found to be poor, and expected to deteriorate over time. In order to address these issues at the major intersections in the area, three (3) options were developed:

- Option 1 – Signal Optimization/Lane Striping
- Option 2 – Intersection Geometric Design
- Option 3 – Roundabout

Pedestrian and bicycle facility improvements were also recommended as a top priority. Existing facilities were found to be either insufficient or non-existent. Recommended improvements included the installation of sidewalks, trails, and bicycle lanes, as well as focusing on improving curb ramps and crosswalks.

Throughout the study, an emphasis was made on utilizing Context Sensitive Design in order to ensure that all roadway improvements also preserve the integrity of the small town feel in Staples Corner. A set of Urban Design Guidelines was developed, and included three (3) components:

- Guiding Principles
- General Guidelines
- Design Features

These guidelines were established to maintain a cohesive and attractive neighborhood feel through any future redevelopment in the Staples Corner area.

Source: Michael Baker Jr., Inc. *Staples Corner Urban Design Study*. October 2009.

## II. Guiding Principles

Guiding principles were developed during the initial stages of the master planning process to steer the development of the process for identifying, prioritizing and evaluating pedestrian and bicycle projects within Anne Arundel County. The guiding principles are used throughout this Plan and are considered the “ideal situation” should there be no constraints.

The goal of this Plan is to elevate walking and bicycle use as legitimate modes of travel. To aid in developing this Plan and to assist in meeting the goal, the following principles have been created:

- Provide a complete Americans with Disabilities Act (ADA) compliant pedestrian network throughout urbanized Anne Arundel County for transportation purposes that allows safe passage from one’s home, work, shopping and other destination areas.
- Provide a complete bicycle network throughout urbanized Anne Arundel County for transportation purposes that allows safe passage from one’s home, work, shopping and other destination areas.
- Provide an off-road shared use facility along community streets leading to all schools, such that children can safely walk or bicycle to school without having to travel in the roadway.
- Encourage all new development to provide links to the pedestrian and bicycle network along the roadway, as well as promote internal pedestrian and bicycle facilities within the development.

### III. Existing Conditions

The first phase of the master planning process in the development of the 2013 Pedestrian and Bicycle Master Plan (PBMP) was the documentation of existing conditions of pedestrian and bicycle facilities within the project study area. **Figure 3** illustrates the project study area as well as the following thematic layers:

- Existing and Proposed Trails
- Existing Sidewalk
- Maryland Department of Transportation (MDOT) On-Road Bicycle Facilities
- Schools
- Light Rail and MARC Stations

Note: This mapping was based upon County GIS data and served as a guide for further study. Field observations were conducted in order to verify the presence and condition of facilities.

#### A. Facility Types

Anne Arundel County's transportation network includes a variety of existing pedestrian and bicycle facilities. Pedestrian facilities, also known as pedestrian access routes, are continuous unobstructed paths connecting accessible elements of a pedestrian system. In general, bicycle facilities are improvements or provisions to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically defined for bicycle use.

The following pedestrian and bicycle facility types and features are currently located within the study area:

**Bicycle Lane** – A portion of a roadway that has been designed for preferential or exclusive use by bicyclists through the use of pavement marking and signs. It is intended for one-way travel, usually in the same direction as the adjacent traffic lane, unless designed as a contra-flow lane.

**Curb Ramp** – A combined ramp and landing to accomplish a change in level at a curb. This element provides street and sidewalk access to pedestrians using wheelchairs.

#### **Pedestrian-Actuated Traffic Control/**

**Pedestrian Signal** – Pushbutton or other control operated by pedestrians designed to interrupt the prevailing signal to permit pedestrians to cross a signalized intersection.



*Bicycle lane along Moreland Parkway, within the City of Annapolis.*

**Shared Lane Marking** – A pavement marking symbol that indicates appropriate bicycle positioning in a shared lane.

**Shared Roadway / Shared Lane** – A roadway, or lane of a roadway, that is open to both bicycle and motor vehicle travel.

**Shared-Use Path** – A path physically separated from motor vehicle traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared-use paths may be used by bicyclists, pedestrians, skaters, wheelchair users, joggers, and other non-motorized users. Most shared-use paths are designed for two-way travel. It is important to note the difference between a shared-use path and a trail. Shared-use paths are included as transportation alternatives, rather than for a recreation purpose only. This distinction is reflected in recent Federal transportation funding (MAP-21) as well as 2013 Public Rights-Of-Way Accessibility Guidelines (PROWAG) accessibility requirements.

**Shoulder** – The portion of the roadway contiguous with the traveled way that accommodates stopped vehicles and emergency use. Shoulders, where paved, are often used by bicyclists.

**Sidewalk** – A paved pathway (asphalt or concrete) beyond the curb or edge of roadway which may run parallel to a highway, road, or street and is intended for pedestrian use. In the State of Maryland, bicycle use on sidewalks is only permitted with signage.

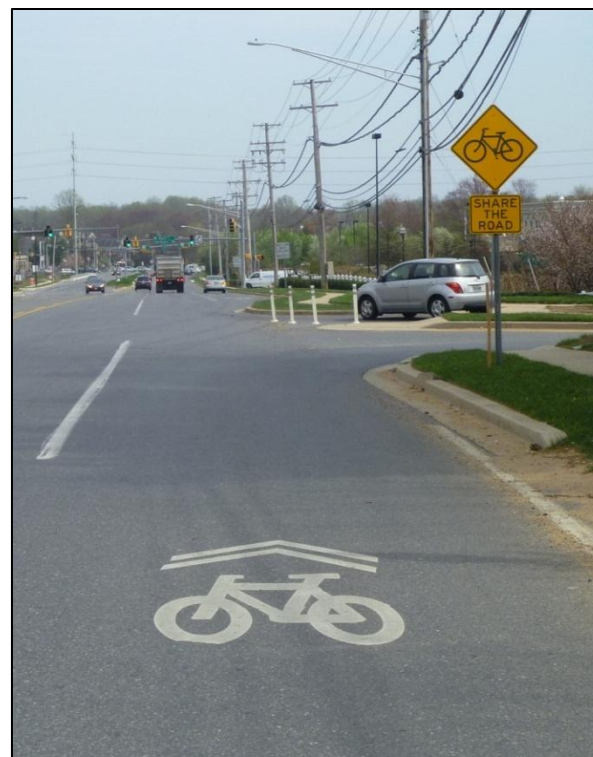
**Wayfinding** – A system of information comprising visual, audible, and tactile elements that help users experience an environment and facilities getting from point A to point B.

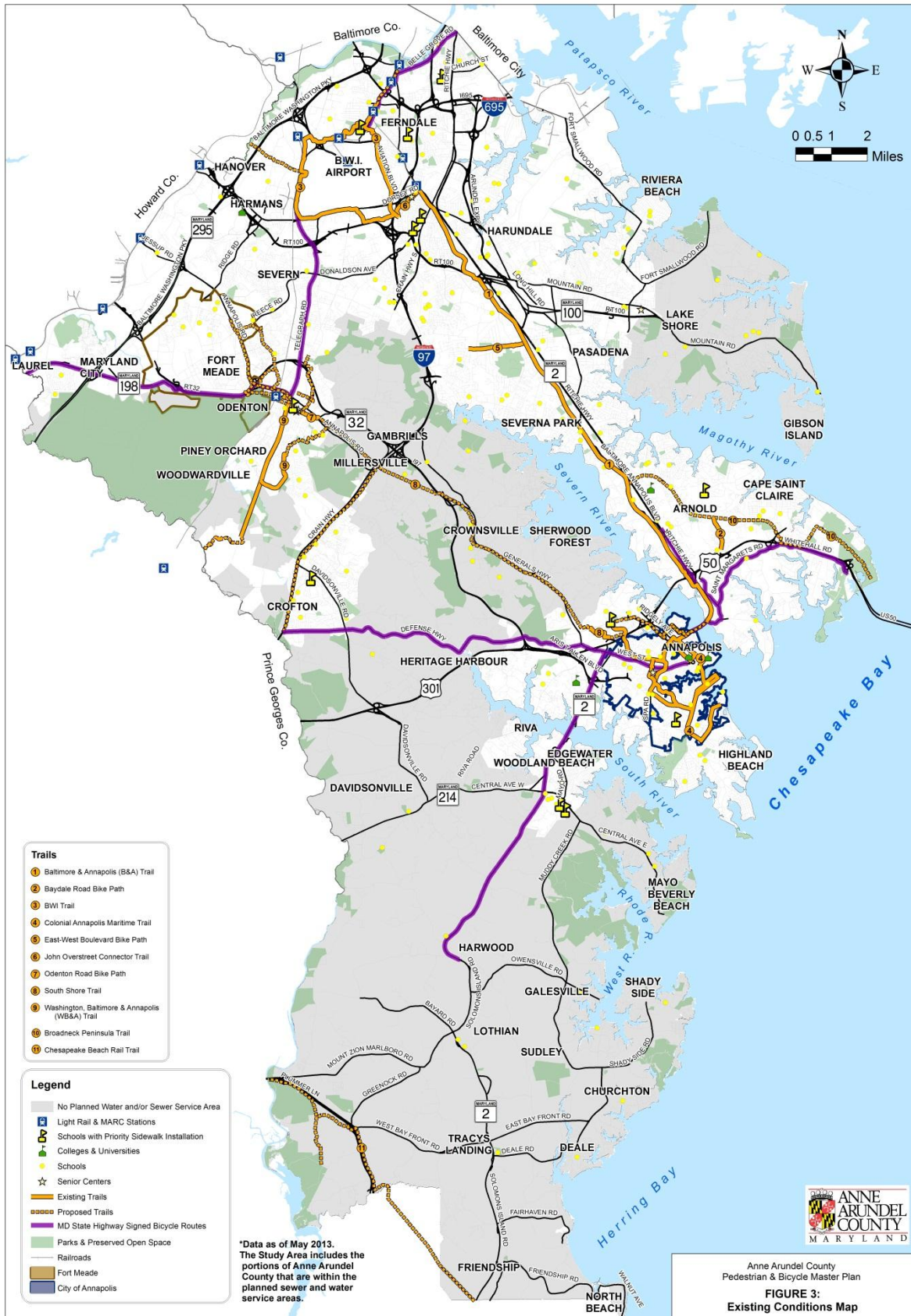
Definitions provided by the AASHTO *Guide for the Planning, Design and Operation of Pedestrian Facilities*, July 2004 and the AASHTO *Guide for the Development of Bicycle Facilities*, 4<sup>th</sup> Edition, 2012.



(Above) Pedestrian Actuated Traffic Control Signage at College Parkway and the Broadneck Trail.

(Below) Shared roadway markings along Waugh Chapel Road approaching Crain Highway (MD 3).







## B. Data Collection and Review

Field data collection locations were identified by reviewing previous County planning documents, obtaining input from both Anne Arundel County Public Schools and the Department of Recreation and Parks, and reviewing the areas mentioned by the public during the Public Listening Sessions held in January and February of 2012. The following includes the data that was collected in the field.

### 1. Review of the 2003 Pedestrian and Bicycle Master Plan

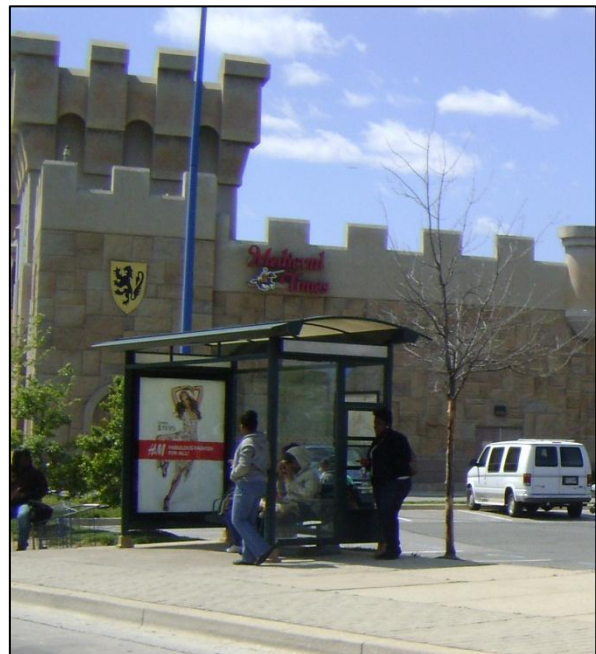
While the focus of the 2013 PBMP is on providing facilities which make walking and bicycling legitimate transportation alternatives, it was still important to review the recommendations of the 2003 Pedestrian and Bicycle Master Plan (2003 PBMP) to determine what improvements have been made to date and if recommended projects not yet acted upon should be carried forward into the 2013 PBMP. The review included the three major recommendation categories of the 2003 PBMP:

- Tier I Recommended Improvements
- Recommended Pedestrian Improvement Zones
- Corridor Plan Locations

In general, many of the recommended improvement areas still included gaps in the pedestrian and bicycle network that contribute to an incomplete network. Sidewalk improvements were limited as were intersection improvements. A detailed account of the 2003 PBMP recommendations with corresponding field review is located in **Appendix F**.

### 2. Arundel Mills Mall

Arundel Mills Mall and surrounding shopping centers and restaurants provide a sufficient sidewalk network for pedestrians along Arundel Mills Circle and Arundel Mills Boulevard. Sidewalks, curb ramps and crosswalks are newly constructed and located throughout the entire area. There are no crosswalk signals, except at the major intersection near the Wal-Mart/Costco shopping centers, making it more difficult and dangerous for pedestrians to cross these busy roadways.



*Sidewalk and transit stop at the Arundel Mills Mall.*

### **3. Extensions of the City of Annapolis Network**

The following roadways are part of the on-road and off-road trail network that extends from the city limits of Annapolis into the study area.

#### **Jennifer Road**

The entrance to Anne Arundel Medical Center at Jennifer Road has newly constructed sidewalks, curb ramps and crosswalks that lead from Jennifer Road onto the hospital campus. The Jennifer Road/Admiral Drive intersection has no sidewalks or crosswalks. A 5-foot wide paved path on the west side of Admiral Drive connects to Jennifer Road and continues approximately 8 feet to its terminus. No sidewalks or crosswalks are located on Admiral Drive south of Jennifer Road. Overall, many gaps exist between newly constructed neighborhoods and older areas, all of which are in the City of Annapolis and therefore beyond the purview of this study.

#### **Solomons Island Road (MD 2)**

Solomons Island Road between West Street and Forest Drive has sidewalks, crosswalks and curb ramps at each of the major intersections. Some smaller side streets in this area, such as Neal Street and Somerville Road, do not have sidewalks that continue down these roads.

#### **Aris T. Allen Boulevard (MD 665)**

Aris T. Allen Boulevard is a major controlled access highway in Annapolis. There are no sidewalks or crosswalks along this roadway.

#### **Old Solomons Island Road (MD 393)**

Old Solomons Island Road connects commercial areas with residential neighborhoods. Old Solomons Island Road has some sidewalks, crosswalks and curb ramps located mainly at the major intersections with West Street and Forest Drive, but also contains some gaps. Some smaller intersections have no crosswalks or curb ramps. The southern end of Old Solomons Island Road through the residential area has no sidewalks for pedestrians and very narrow shoulders along the roadway for bicyclists. There is, however, an informal dirt path south of Forest Drive that is located on the southeast side of Old Solomons Island Road. Old Solomons Island Road is a State Highway (MD393) located almost entirely in the City of Annapolis and is therefore not under the purview of Anne Arundel County.

#### **Baltimore-Annapolis Boulevard / Governor Ritchie Highway / (MD 450)**

MD 450 changes from Baltimore-Annapolis Boulevard to Governor Ritchie Highway at the intersection north of the U.S. Naval Academy Bridge. Baltimore-Annapolis Boulevard has sidewalks that cross over the U.S. Naval Academy Bridge on both sides. A designated bicycle lane begins on the south end of the bridge and continues over the bridge along the southbound lane, and merges into a turn lane to Jonas Green Park.

This park is located below the bridge along the Severn River. The sidewalks crossing the bridge terminate at the north side of the bridge and do not continue along Governor Ritchie Highway.

### **Forest Drive**

Forest Drive from Spa Road to where it becomes Bay Ridge Road contains sidewalks along the majority of the road, but also contains multiple gaps. Some smaller intersections along Forest Drive are lacking crosswalks and curb ramps. Where Forest Drive becomes Bay Ridge Road, a designated bicycle lane begins within the vicinity of Peninsula Park and the Bay Ridge Christian Church.

### **Quiet Waters Park**

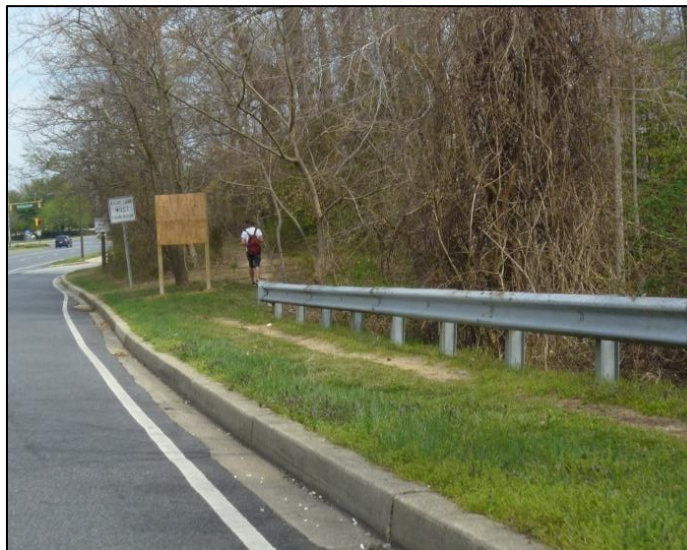
Quiet Waters Park in Annapolis is located off of Hillsmere Drive and consists of paved hiking/nature trails, gardens, playgrounds, and picnic areas.

### **Colonial Annapolis Maritime Trail**

The Colonial Annapolis Maritime Trail is an officially designated part of the East Coast Greenway Trail which runs from Maine to Florida. It is approximately two miles long and connects neighborhoods and parks. The trail consists of both paved and unpaved/dirt paths throughout neighborhoods, parks and forest. Connection points to neighborhoods were observed at Fox Hollow Lane and Cardinal Court.

## **4. Anne Arundel Community College**

The main campus of Anne Arundel Community College in Arnold provides a sufficient sidewalk network for pedestrians within the limits of the campus. Off-campus pedestrian connections on College Parkway and Governor Ritchie Highway (MD 2) are very limited. Where sidewalks exist along these roadways, they do not lead to destinations.



*Dirt path along eastbound College Parkway near AACC.*

## 5. Existing Trail Network

The following trail facilities were evaluated to determine gaps in the existing trail system, as these trails were brought up for discussion during the Public Listening Sessions.

### **Baltimore and Annapolis (B&A) Trail**

The B&A Trail runs northward from Annapolis towards Baltimore, with multiple connections to residential areas. No gaps were found in the trail at the observed areas along its length. At its northernmost end, the trail is connected to the BWI Trail by the John Overstreet Connector Trail. The trail ends at its southernmost point on the Eastern side of the Severn River. A connection to existing trails on the Western side of the river does not currently exist.

### **BWI Trail**

The BWI Trail is a closed loop that encompasses the BWI Airport area. No gaps exist on the trail itself, and it is accessible for pedestrians and bicycles along its entire length. Additionally, the trail connects to residential areas and transit stations. Residential connections exist at Andover Road, Zachary Lane, Main Ave, and Warren Ave. The Trail also connects to several rail stations: the Linthicum Light Rail Station, BWI Business District Light Rail Station, and the MARC BWI Rail Station. These connections provide non-vehicular access to the airport.

### **Connection from Lake Waterford Park to East West Boulevard Bike Path**

A recognized gap within the trail system exists along Pasadena Road between Governor Ritchie Highway and Old Annapolis Boulevard. An extension of the East West Boulevard Bike Path eastward across Governor Ritchie Highway would provide a connection to Lake Waterford Park, as well as several residential areas.

### **Washington, Baltimore & Annapolis (WB&A) Trail**

When complete, the Washington, Baltimore and Annapolis (WB&A) Trail will be an 8.97 mile rail trail. Currently, there are two unconnected sections in Anne Arundel and Prince George's Counties. The portion of the trail currently constructed in Anne Arundel County begins in the western portion of the county southwest of the Piney Orchard community. Near Piney Orchard, the trail spurs to the northeast with the main section of trail continuing north and terminating in Odenton at Odenton Road. The spur portion of the trail was opened in 2007 and runs along the road right-of-way of Strawberry Lake Way.

There are two proposed portions of the WB&A Trail. The first is an extension of the Strawberry Lake Way spur northward towards Annapolis Road providing access to the Odenton Natural Area. The second proposed portion of trail is the connection to Prince George's County which requires a bridge crossing of the Patuxent River which is currently under study.

The trail is part of the East Coast Greenway and the American Discovery Trail.

## Broadneck Trail

During the initial existing conditions evaluation for the 2013 PBMP, the Broadneck Trail was a proposed project in the design phase. Since the onset of the master planning process, Phase IA of the Broadneck Trail has nearly reached completion. Phase II of the Broadneck Trail has been funded for design. Phases III through V of the trail have not yet been funded. When complete, the Broadneck Trail will provide a continuous off-road shared-use connection from Governor Ritchie Highway (MD 2) to Sandy Point State Park, roughly paralleling the College Parkway corridor in the Broadneck area.



*Broadneck Trail Phase IA under construction in April 2013.*

## 6. Governor Ritchie Highway (MD 2) Corridor

A review of aerial photography along Governor Ritchie Highway (MD 2) showed a number of gaps in the pedestrian network. South of the MD 100 interchange, in the Severna Park and Pasadena areas, pedestrian facilities exist at most major intersections. However, there are no sidewalks along Governor Ritchie Highway between these intersections to connect residential and commercial areas. SHA is in the process of planning/constructing various sidewalk projects extending from Arnold to Glen Burnie.

North of the MD 100 interchange, in Glen Burnie, sidewalks and crosswalks connect residential areas to commercial areas at almost every intersection. Sidewalks extend along cross streets into residential neighborhoods at most intersections, but seldom parallel Governor Ritchie Highway.

North of the I-695 Interchange, in Brooklyn Park, the corridor is a mix of residential and commercial areas. Near the commercial areas and major intersections, there are existing sidewalks and crosswalks that exist. Pedestrian facilities are not provided along

Governor Ritchie Highway, and no crosswalks are provided to connect residential areas across Governor Ritchie Highway at signalized intersections.

The MD 2 / Governor Ritchie Highway Corridor Study on Sidewalks / ADA Accessibility Improvements from Anne Arundel Community College to North Glen Burnie was referenced as an additional resource for detailed information about the corridor's pedestrian facilities and potential areas for improvements.

## **7. Anne Arundel County Schools**

The existing pedestrian network in Anne Arundel County has some gaps, particularly around the area schools. While reviewing the majority of the County schools and their immediate surrounding areas, it was noted that nearly all of the schools lack a complete network of sidewalks to facilitate walking to school as a viable and safe mode of transportation. Curb ramps are largely nonexistent and many sidewalks are either missing or insufficient.

In several of these areas, the demand for sidewalks is evident. For example, along Freetown Road near Freetown Elementary School there are areas along the road where, in the absence of sidewalks, informal dirt paths have formed from pedestrian activity. These types of paths can also be seen along Wellham Avenue near George Cromwell Elementary School, at the intersection of MD 648 and Windy Hill Lane near North County High School, and along Hammonds Lane near Brooklyn Park Middle School just to name a few.

In areas without sufficient sidewalks or other off-road paths, pedestrians are required to walk along the shoulder of the road. Some streets, such as Arundel Beach Road north of Folger McKinsey Elementary School, provide wide shoulders for pedestrians. However, on some streets the shoulders are narrow and do not provide safe conveyance to pedestrians. These conditions can be seen in several areas near schools such as on Freetown Road near Freetown Elementary School where the sidewalk ends and foliage grows up to the roadway. Similar conditions were found on Olen Drive near George Cromwell Elementary School, Hoyle Lane near Jones Elementary School, and Outing Avenue near George Fox Middle School.

An especially dangerous situation exists on Jumpers Hole Road, near Severna Park Middle School. This roadway is heavily traveled both by vehicular and pedestrian traffic. While a sidewalk is provided on the west side of Jumpers Hole Road from Benfield Road north to the school entrance, no sidewalk exists on either side of the road north of the school entrance. Additionally, this section of road does not have shoulders for pedestrians to use, creating a very dangerous environment for students who are walking to school from the many residential neighborhoods in this area.

The Anne Arundel County Board of Education is cognizant of the need for sidewalks and has identified schools/areas of top priority. The following list identifies the twelve

sidewalk priorities of Anne Arundel County Public Schools by location and the specific schools that will benefit. These schools are identified in **Figure 3**.

- **Shore Acres Road** – Broadneck Elementary
- **Bestgate Road waiting pad** – Annapolis Area Christian School
- **Aquahart Road** – Corkran Middle School (also in area: Richard Henry Lee Elementary School)
- **Duke of Kent Drive** – Crofton Elementary School
- **Stewart Avenue** – Richard Henry Lee Elementary School (also in area: Corkran Middle School)
- **Forest Drive, from Martha Road to Forest Hills Road in Annapolis** – Tyler Heights Elementary
- **Monterey Avenue, Odenton** – Odenton Elementary
- **Londontowne Road in Edgewater, from Mayo Road to Chesapeake Drive** – South River High School, Central Middle School (also in area: Edgewater Elementary School)
- **Hammonds Ferry Road from Kingbrook Road to Kingwood Road** – Middle School, Linthicum Elementary School
- **Quarterfield Road from Old Stage Road to Thelma Avenue** – Corkran Middle School (also in area: Glen Burnie Park Elementary School)
- **Baltimore-Annapolis Boulevard from North County High School to Burwood Shopping Center** – North County High School
- **Hammonds Lane from Mark Road to Northern District Police Station** – Brooklyn Park Middle School, Brooklyn Park High School

## **8. Field Data Observations Summary**

Several gaps requiring pedestrian and bicycle improvements were identified throughout the study area of the County. They include, but are not limited to the following locations that need to be addressed:

### **Pedestrian:**

- Elementary and Middle Schools with no sidewalks as identified in the Schools Section of the Field Data Collection
- Crossings of Governor Ritchie Highway
- The connection of Kinder Farm Park to Severna Park Middle School near Jumpers Hole Road
- Lake Waterford Park connection to East-West Boulevard Bike Path which is in Pasadena.
- On and off-road trail connections to Trail heads
- Arundel Mills Mall opportunities
- Connections from neighborhoods to arterial roadways in high density areas

- Connections from neighborhoods to major transit facilities (i.e. Light Rail Stations, MARC Stations, BWI Amtrak station)

**Bicycle:**

- Anne Arundel Community College connections from B&A Trail
- B&A Trail ends/transitions
- Radial extensions from Annapolis Master Plan
- WB&A Trail connections
- Arundel Mills Mall connections
- Facilities around Transit Stations
- County Connections to State Routes

**C. Traffic Data****1. Existing Traffic Patterns**

The ability to improve bicycle usage and operations along roadways is influenced by the type and volume of traffic along the roadway. One of the key considerations for reducing the number of automobile trips and encouraging the use by pedestrians and bicycles is to be able to provide a safe alternative facility. Improvements in safety to a corridor can encourage pedestrian and bicycle trips. The places of greatest demand for pedestrian and bicycle trips and for the reduction of automobile trips would provide the optimal locations for these improvements. In order to define these alternatives, it is necessary to identify trip destinations and the periods where the most automobile trips take place. This occurs during the AM and PM peak periods and specifically relates to the number of home based work trips and traffic congestion along various corridors.

Traffic operations were analyzed as part of the Maryland State roadways through the use of the Maryland Statewide Congestion Assessment for the AM and PM peak periods (2008). This was based on a combination of aerial analysis of the corridors, Synchro simulations and Highway Capacity Analysis Results. These results are illustrated in **Appendix G** based upon roadway level of service (LOS).

In addition, a separate study performed as part of the Anne Arundel County Corridor Growth Management Plan analyzed home based work trips associated with travel sheds in nine corridors. Four of those corridors (MD 2 north, MD 2 south, MD 3 and Magothy Bridge Road) represent locations where pedestrian and bicycle usage could be encouraged to reduce peak period automobile trips. The number of single occupant home based work vehicle trips in these corridors represent 79% to 83% of the total trips. These trips are the most likely possibilities to influence travel behavior, especially if the distance of the commute is relatively short (which for this study was two miles).



## 2. Crash Data

Safety for pedestrians and bicyclists has been identified by the County and stakeholders as a priority. In order to identify intersections and corridors which may be especially prone to dangerous pedestrian or bicycle collisions, crash data for the study area was obtained from the ITO Road Fatalities USA web map service (as currently, a comprehensive pedestrian and bicycle crash database for all roads in Anne Arundel County does not exist). This service provides the location of pedestrian and bicycle crashes resulting in fatalities which were reported between 2001 and 2009. Fatality data is supplied to ITO via the Fatality Analysis Reporting System of the National Highway Traffic Safety Administration (NHTSA).

A total of seven bicycle crashes resulting in fatalities were recorded from 2001 to 2009 in the project study area. The chart below summarizes the locations of these crashes. Two of the seven crashes occurred along the Governor Ritchie Highway (MD 2) corridor. Although there have not been a high number of bicycle collisions resulting in fatalities, attention should still be given to providing safe facilities for users with an anticipated increase in the bicycling mode share.

There were considerably more crashes resulting in a pedestrian fatality in the study area during the 2001 to 2009 time frame. A total of 60 pedestrian crashes resulting in fatalities were recorded along roadways in the project study area. Pedestrian crashes were the most concentrated along the following roadways:

- Crain Highway (MD 3 Business), between Governor Ritchie Highway (MD 2) and MD 100, and in the vicinity of Davidsonville Road
- Governor Ritchie Highway (MD 2), between Hammonds Lane and Jumpers Hole Road, at the intersection with Cypress Creek Road, at the intersection with College Parkway, at the intersection with Old Frederick Road
- Bay Dale Drive, between US 50 and Broadneck Road
- Laurel Fort Meade Road (MD 198) near Corridor Marketplace
- Mountain Road (MD 177), between Catherine Avenue and Tick Neck Road

A comprehensive listing of the pedestrian crash fatalities can be found on the following pages.

Source: <http://map.itoworld.com/road-casualties-usa#>

**Bicycle Fatalities Occurred at the Following Locations from 2001 – 2009:**

- Summit Avenue & Chain O Hills Road
- Governor Ritchie Highway (MD 2) & 8<sup>th</sup> Avenue
- Nursery Road & I-695
- Governor Ritchie Highway (MD 2) & Hamburg Street
- Marley Neck Boulevard & Bohemian Beach Road
- Telegraph Road (MD 170) & Bennett Place
- Harmans Road & MD 100

**Pedestrian Fatalities Occurred at the Following Locations from 2001 – 2009:**

- Annapolis Road (MD 175) & MD 295
- Arundel Expressway (MD 10) & Baltimore Annapolis Boulevard
- Aviation Boulevard, north of Mathison Way
- Baltimore Annapolis Boulevard & Oak Lane SW
- Bay Dale Drive & Whispering Woods Drive
- Bay Dale Drive & US 50
- Bay Hills Drive & Old Stone Lane
- Beachwood Park Road
- Catherine Avenue & MD 100
- College Parkway & Deer Creek Run
- Crain Highway North (MD 3) & North Langley Road
- Crain Highway North (MD 3) & 6<sup>th</sup> Avenue NE
- Crain Highway (MD 3) & Aquahart Road
- Crain Highway (MD 3) & Oak Manor Drive
- Crain Highway (MD 3) & Clubhouse Gate Road
- Crain Highway (MD 3) & Crofton Station Court
- Crownsville Road & Kansala Drive
- East Furnace Branch Road & Country Club Drive
- Fort Smallwood Road (MD 173) & Riviera Drive
- Hammonds Lane & I-895
- Hospital Drive & Elvaton Drive
- I-695 & MD 295
- I -97, north of Crownsville Road
- Laurel Fort Meade Road (MD 198) & Corridor Marketplace
- Laurel Fort Meade Road (MD 198) & Red Clay Road

- MD 32, near Burns Crossing Road
- Mountain Road & Catherine Avenue
- Mountain Road & Mansion House Crossing
- Mountain Road & Brookfield Road
- Myrtle Avenue
- North Hammonds Ferry Road & Nursery Road
- North Camp Meade Road & I-695
- Price Road & Chapman Road
- Reece Road & Andorick Drive
- Ridgely Avenue & River View Avenue
- Rita Drive & Roundtop Road
- Governor Ritchie Highway (MD 2) & Aquahart Road
- Governor Ritchie Highway (MD 2) & Delaware Avenue
- Governor Ritchie Highway (MD 2) & Georgia Avenue NW
- Governor Ritchie Highway (MD 2) & 6<sup>th</sup> Avenue NE
- Governor Ritchie Highway (MD 2) & Vernon Avenue
- Governor Ritchie Highway (MD 2) & East Ordinance Road
- Governor Ritchie Highway (MD 2) & Cherry Lane
- Governor Ritchie Highway (MD 2) & Camrose Avenue
- Governor Ritchie Highway (MD 2) & Mountain Road
- Governor Ritchie Highway (MD 2) & Kellington Drive
- Governor Ritchie Highway (MD 2) & Jumpers Hole Road
- Governor Ritchie Highway (MD 2) & Cypress Creek Road
- Governor Ritchie Highway (MD 2) & College Parkway
- Governor Ritchie Highway (MD 2) & Old Frederick Road
- Riva Road & Forest Drive
- Shore Acres Road & Bay Hills Drive
- Telegraph Road (MD 170) & Annapolis Road (MD 175)
- Telegraph Road (MD 170) & Jasons Landing Way
- US 50, west of South Haven Road
- West Ordinance Road & Roberts Court

## IV. Project Identification & Evaluation – Process

### A. Overview of the Process

Following the completion of the documentation of existing conditions, the next step in the development of the 2013 PBMP included the development of a Project Identification and Evaluation Process. This Process was developed based on the Guiding Principles, existing conditions data collection, Project Management Team (PMT) input, public input, and jurisdictional research of other pedestrian and bicycle master planning efforts.

The purpose of the Process is to evaluate and rank pedestrian and bicycle projects for inclusion in the 2013 PBMP. The flow chart displayed in **Figure 4** and discussion which follows describes this Process in further detail. The main steps of the Process include:

- **Project Identification** – Does a project meet the basic criteria to be included in the 2013 PBMP?
- **Prioritization** – Does the project have a High, Medium or Low level of significance?
- **Evaluation Criteria** – How does the project rank among other projects within the same level of significance?

### B. Project Identification

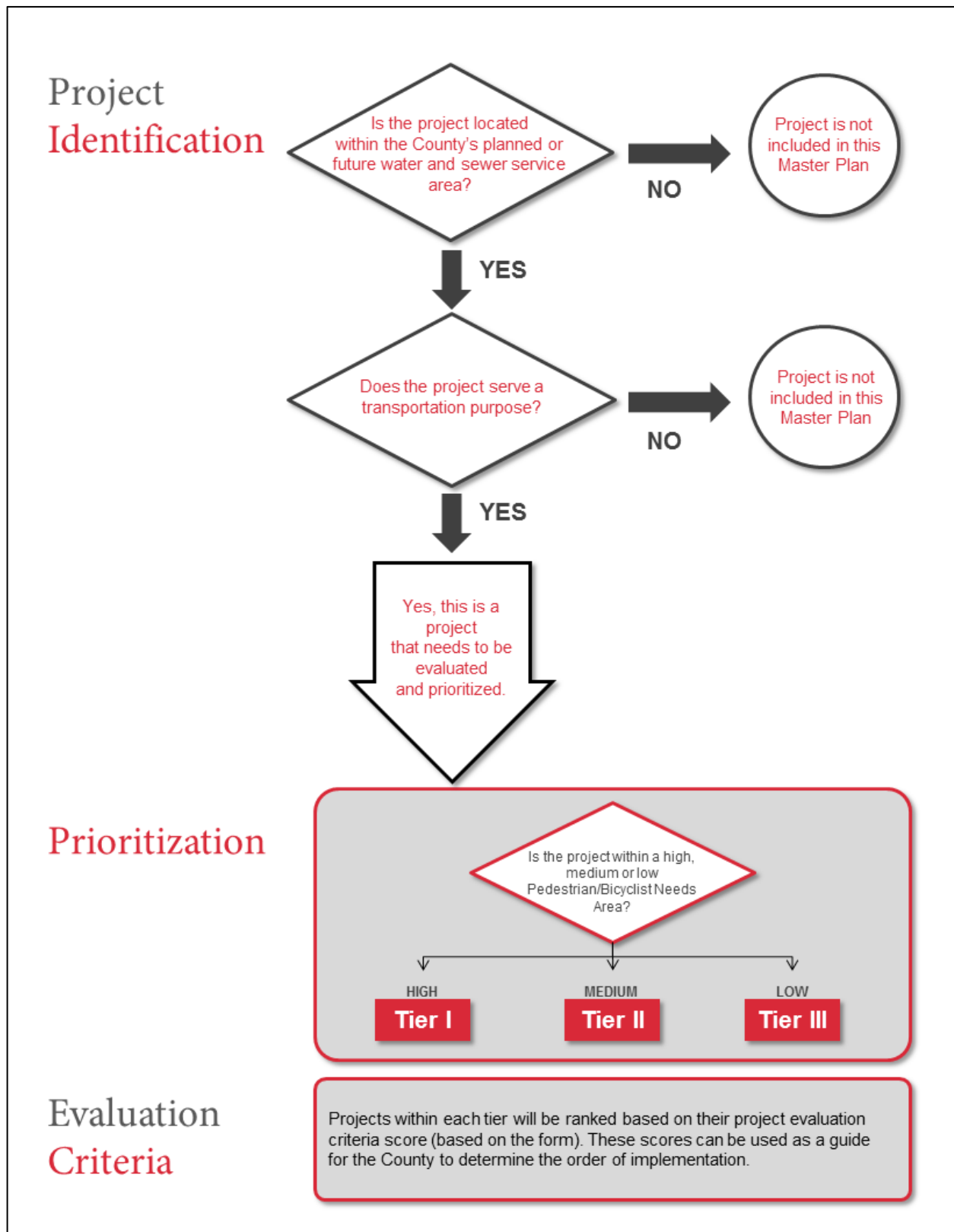
The identification of improvement options has been an ongoing effort initiated at the start of the project in January 2012 and has continued throughout the master planning process.

Through a variety of public involvement opportunities, discussions with the Project Management Team (PMT) including representatives from various departments throughout the County, the Baltimore Regional Transportation Board (BRTB), State, City of Annapolis, and members of the Citizens Advisory Committee (CAC), a list of potential projects was started. This list was then supplemented with a document review of the various relevant plans identifying pedestrian and bicycle facilities throughout the County, as well as field research completed to determine various gaps and deficiencies in the existing network within the urbanized sections.

Public comment was included from:

- Public Listening Session #1, January 31, 2012
- Public Listening Session #2, February 7, 2012
- Public Listening Session #3, February 22, 2012
- Public Meeting #1, July 24, 2012
- Public Meeting #2, July 31, 2012

Figure 4: Process Flow Chart



- Public Meeting #3, August 1, 2012
- Citizens Advisory Committee Meetings

County and community stakeholder comment was included from:

- Project Management Team Meetings
- Anne Arundel County Capital Improvement Program
- Anne Arundel County Pedestrian/Transit Facility Access Improvements Multi-year Project List

Master Plans and other planning documents referenced included:

- 2002 Maryland Department of Transportation (MDOT) 20 Year Bicycle & Pedestrian Access Master Plan
- 2003 Anne Arundel County Pedestrian/Bicycle Master Plan
- 2006 Anne Arundel County Land Preservation Park and Recreation Plan
- 2007 Odenton Trails Schematic Plan
- 2011 Annapolis Bicycle Master Plan
- Anne Arundel County Small Area Plans

After a project has been initially identified, it enters the Process Flow Chart in **Figure 4**. The first step in the Process, Project Identification, will determine if a potential project should be evaluated. Only once a project has successfully met the two (2) major requirements of Project Identification can it continue on in the Process to be Prioritized and Evaluated.

The first requirement of Project Identification is for the project to be within the County's current Planned Water and Sewer Service Area, known as the County's urbanized area. This determination was completed using a GIS overlay provided by the County. This area of the County was selected as there is a much greater probability that walking or bicycling could be an option to satisfy a trip since the trip length is probably shorter than in the rural areas of the County. If a project is located within the service area, there is a "potential" project to be evaluated. Otherwise, the project will not be included in the project list that will ultimately be incorporated in the 2013 PBMP.

The second consideration for "potential" projects relates to the Guiding Principles of the 2013 PBMP which include the provision of pedestrian and bicycle facilities contributing to an overall network where walking and bicycling are viable transportation alternatives. All projects that serve a transportation purpose and were identified in previous Master Plans or other adopted Small Area or Functional Master Plans located within the defined study area and not already built (as determined through the *Existing Conditions Technical Memorandum 1*) were considered as projects for the 2013 PBMP.

In summary, Project Identification assures that the project satisfies the following criteria:

- Is located within the boundaries of the County's current Planned Water and Sewer Service Area, and
- Serves a transportation purpose.

The project team submitted a Preliminary List of Improvement Options to the County for comment in September 2012. Following this review, the project team incorporated a categorization scheme in order to identify projects as being within one of the following categories:

- **In Master Plan** – This includes projects identified in a County or other area master plan (e.g. 2011 Annapolis Bicycle Master Plan or Small Area Plan) which should be evaluated.
- **Feasible** – This includes additional projects which were deemed feasible and should be evaluated.
- **Missing Link Outside County Control** – These are projects which are outside of County control, but fill a missing link which would improve pedestrian and bicycle access. These projects are small links that complete a larger trip along County controlled roadways. These projects should be evaluated.
- **State Route** – These are projects which are located along a State roadway. These projects will be evaluated, but are maintained within their own category due to the different planning and coordination approach that may be necessary with these projects. These projects may involve a combination of funding sources as well as associated roadway improvements as part of larger corridor planning studies and improvement projects (e.g. MD 198 Project Planning Study). By maintaining projects along State Routes separately, the County can easily delineate between these projects and those completely within County jurisdiction.
- **Outside Study Area** – These are projects which are outside of the Plan's study area because they are not within a Planned Sewer or Water Service Area or they are within the City of Annapolis or Fort Meade limits. These projects will not be evaluated, but are included on visual displays in order to show potential countywide connectivity of pedestrian and bicycle facilities.
- **Dropped** – These are projects which were removed from consideration. These projects include those which were determined "Not Feasible" by the County/project team; and those which are duplicates of other improvement options already identified elsewhere in the List of Improvement Options. The list of "Dropped" projects is included in **Appendix H** of this document.

- **General** – These are projects which were removed from consideration due to broad context or programmatic nature. These recommendations have been incorporated into the Policy, Non-Infrastructure, and Implementation recommendations of the 2013 PBMP.

**Appendix I** includes a listing of all projects which fell into the categories of: In Master Plan, Feasible, Missing Link Outside County Control and State Route. These are the 146 projects to be evaluated.

**Appendix J** includes a listing of all projects which fell into the category: Outside Study Area. These 40 projects will not be evaluated, but may be considered for implementation by others.

Projects from both lists are illustrated in **Figure 5**, a countywide display of all projects identified. Projects are illustrated as points (intersection improvements, site improvements) and lines (sidewalk installation, shared-use paths, and roadway markings).

Note: The color of the points and lines in **Figure 5** correspond to the category of the improvement option listed in **Appendix I and J**. For this reason, color reproduction of this report is recommended.

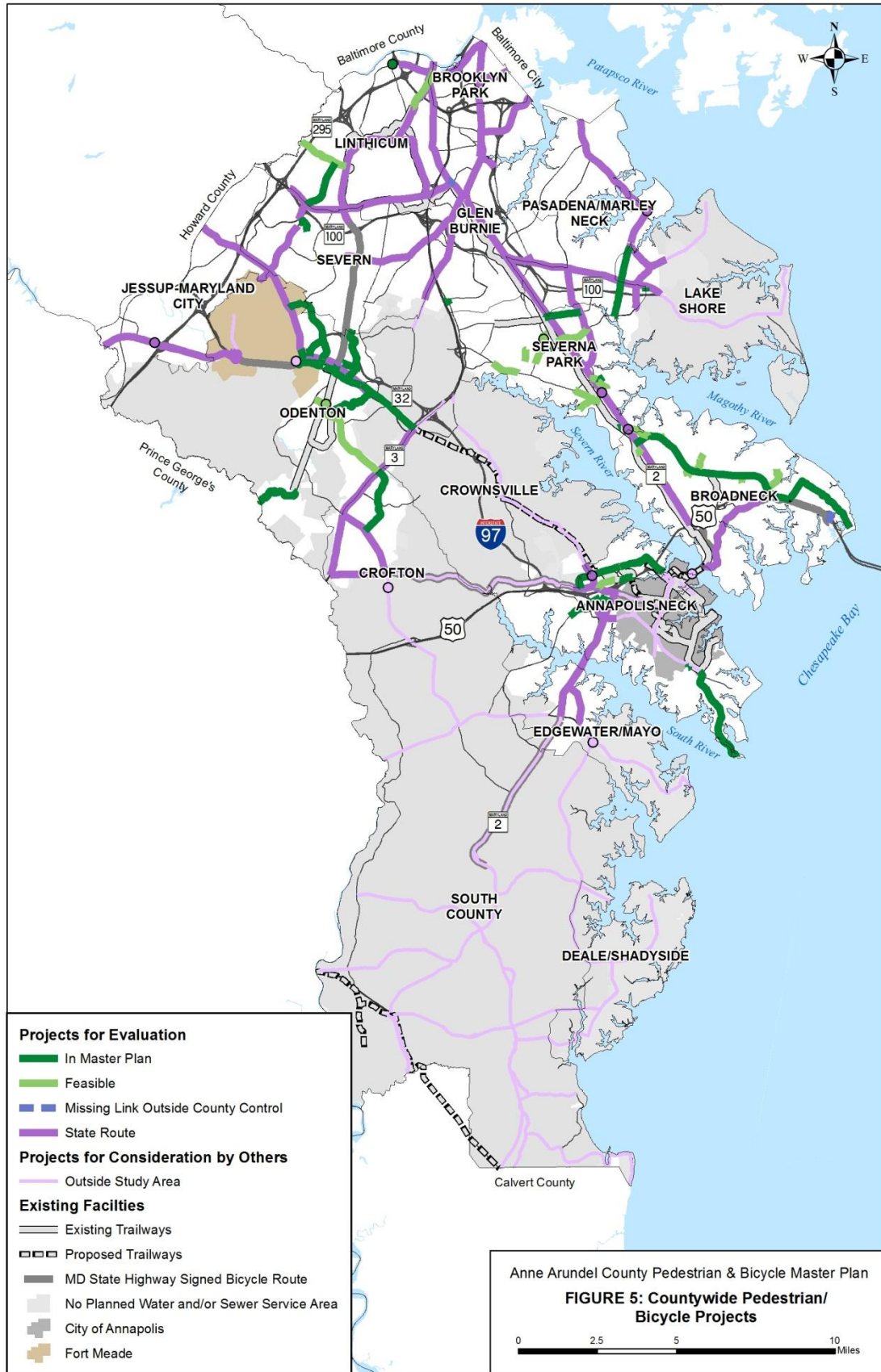
### C. Prioritization

Following Project Identification, a Prioritization Methodology was developed based on Pedestrian/Bicycle Needs Areas. The Pedestrian / Bicycle Needs Areas were developed through identifying and overlaying two basic types of areas: Pedestrian / Bicycle Generators and Pedestrian / Bicycle Attractors. Pedestrian / Bicycle Generators are those demographic factors that create (generate) trips from the origin. Pedestrian / Bicycle Attractors are the areas throughout the overall urbanized study area that are the destination points for trips based on high density of employment and/or retail and entertainment.

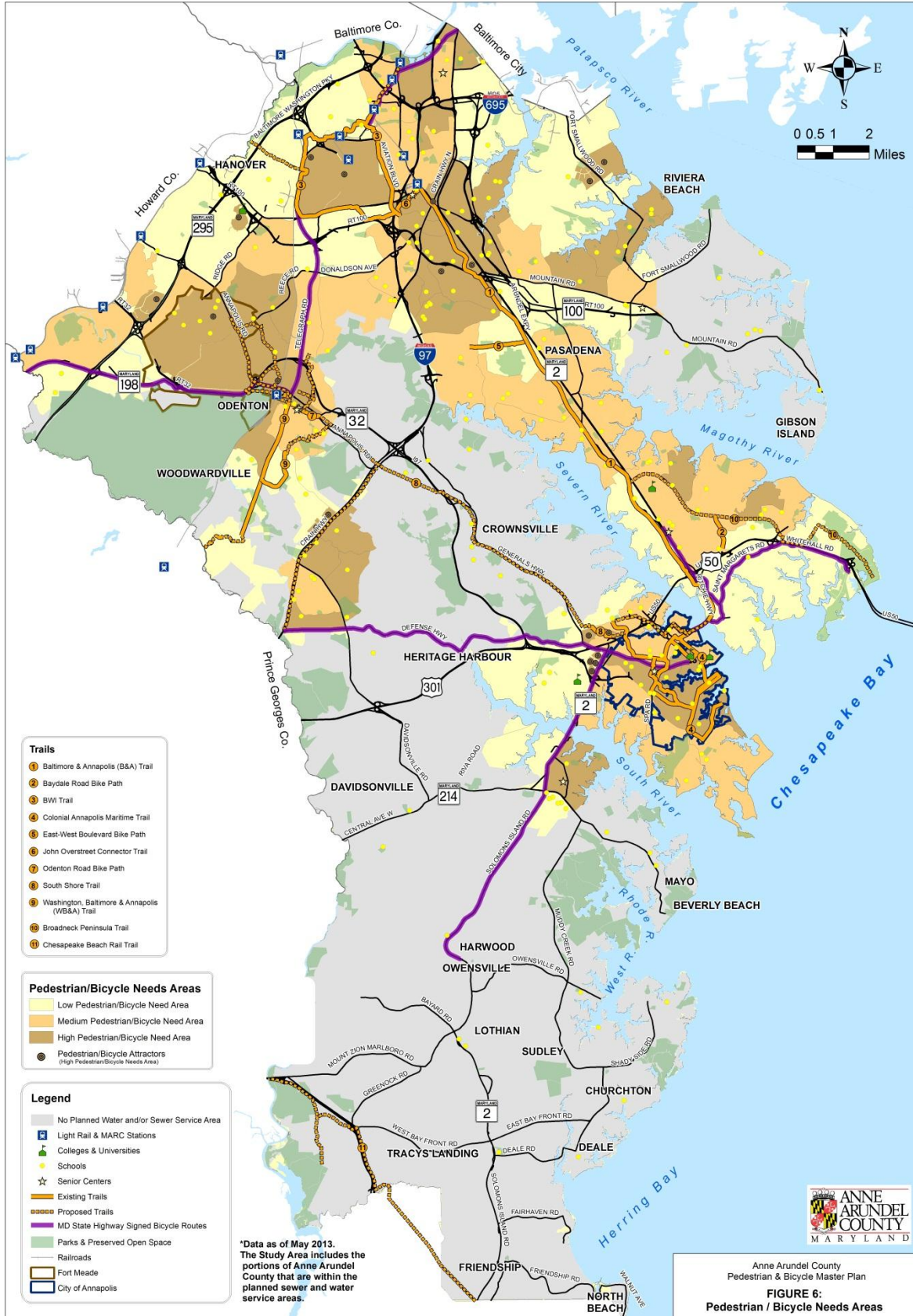
Once the overall areas Generators and Attractors were determined, the Pedestrian/Bicycle Needs Areas were then broken into categories of High, Medium and Low need throughout the study area. **Table 2** illustrates how the ranking of the Generators and of the Attractors combine to create the overall Pedestrian/Bicycle Needs Areas and how they relate to the High, Medium or Low Needs. The methodology is further explained below.

**Figure 6** illustrates how each of the projects identified in the Project Identification step of the Process will fall into a High, Medium or Low Pedestrian/Bicycle Needs Area which corresponds to Prioritization Tier I, II and III projects, respectively. The term “Prioritization Tier” is unique to the 2013 PBMP. It should not be confused with the different project “Tier” structures of the 2003 PBMP, nor the 2002 MDOT Bicycle & Pedestrian Access Plan.

The discussion which continues on Page 43 describes the determination of High, Medium, and Low Pedestrian/Bicycle Needs Areas in greater detail.







**Table 2: Prioritization Methodology Summary**

Pedestrian/Bicycle Needs Area		Prioritization Tier
<b>High</b>	High Pedestrian/Bicycle Generator Score  <b>AND/OR</b>  Pedestrian/Bicycle Attractor	<b>Tier I</b>
<b>Medium</b>	Medium Pedestrian/Bicycle Generator Score  <b>No</b> Pedestrian/Bicycle Attractor	<b>Tier II</b>
<b>Low</b>	Low Pedestrian/Bicycle Generator Score  <b>No</b> Pedestrian/Bicycle Attractor	<b>Tier III</b>

**Pedestrian / Bicycle Generator**

Pedestrian / Bicycle Generators were defined as areas with high potential to create, or “generate”, a pedestrian or bicycle trip from the origin. To identify generator areas for pedestrian and bicycles, several demographic based factors were reviewed and overlaid to develop the overall generators. These criteria; Population Density, Age, and Median Household Income; are factors that have been shown through a variety of research to lend themselves to generating pedestrian and bicycle trips when evaluating the ends of the spectrum for these data sets.

To evaluate this information, Census Tracts were used and given a Pedestrian / Bicycle Generator Score based on the cumulative rating process of combining the three demographic factors. Based on the distribution of all scores for the county, Census Tracts were divided into High, Medium or Low Pedestrian/Bicycle Generator categories. These categories directly correlate to the High, Medium and Low Pedestrian/Bicycle Needs Areas as illustrated in **Figure 6**.

**Table 3: Pedestrian/Bicycle Generator Classification Index**

Indicator	Score	Weighted Multiplier	Weighted Score
<b>Population Density</b>			
High (> 8 persons per acre)	3	2	6
Medium (5-8 persons per acre)	2		4
Low (2-5 persons per acre)	1		2
No Score (<2 persons per acre)	0		0
<b>Youth Population</b>			
High (>1.5 persons per acre)	3	2	6
Medium (0.5-1.5 persons per acre)	2		4
Low (<0.5 persons per acre)	1		2
<b>Senior Population</b>			
High (>0.6 persons per acre)	3	1	3
Medium (0.3-0.6 persons per acre)	2		2
Low (<0.3 persons per acre)	1		1
<b>Median Household Income</b>			
Low (<65,000)	3	1	3
Medium (\$65,000 to \$105,000 per year)	2		2
High (>\$105,000 per year)	1		1

### Population Density

Population density was selected as one of the determining factors for identifying the prioritization for a project. This factor was used to determine if there would be substantial use of the proposed project based on the residential density of an area. The quantitative measure for population density was accomplished through the use of 2010 U.S. Census Summary File 1 (SF1) data at the Census tract level for each of the 104 tracts within Anne Arundel County. The 2010 population was divided by the land area of each tract to determine population densities. The median population density was 4.2 persons per acre. Based on this information, groupings of High, Medium and Low Population Density were established. A No Score category was added for the least dense areas of the County as these Census tracts are not representative of the urbanized area qualification established at the onset of the Process.

- High – greater than 8 persons per acre
- Medium – between 5 and 8 persons per acre
- Low – between 2 and 5 persons per acre
- No Score – less than 2 persons per acre

Higher density residential areas are positioned to be the most likely points from which a person will originate a walking or bicycling related trip. With the assumption that higher population density supports a greater possibility of pedestrian and bicycle generated

trips, the High Population Density category receives the most points towards the overall Pedestrian/Bicycle Generator Score (see **Table 3**). Because the overall population density has the greatest potential to influence the number of people in an area which will generate trips, this indicator was assigned a weighted multiplier of 2.

### **Age**

The population density of two sub-populations; those under the age of 16 and those over the age of 65; were also considered in order to determine if a Census tract has a greater chance of generating pedestrian and bicycle trips.

The youth population, those under 16 years of age, are not legally permitted to operate a motorized vehicle on a public roadway and are therefore, more likely to depend upon walking and bicycling on a public roadway. Likewise, the senior population, those 65 years of age and older, may be unable to drive a car and subsequently depend upon a good sidewalk network for access to destinations or transit.

A study completed by the International Journal of Behavioral Nutrition and Physical Activity states: “An inverted-U relationship was observed between ages and walking for transport, whereby younger and older respondents showed equally higher levels of walking than did those aged 30–50 years”

UW stat (2003): In addition, younger people tend to use bicycles for transportation, and the elderly tend to walk more than other age cohorts.

### **Youth Population**

The median population density of the County’s youth (under 16 years of age) is 0.9 persons per acre. Based on this information, groupings of High, Medium and Low Population Density were established.

- High – greater than 1.5 persons per acre
- Medium – between 0.5 and 1.5 persons per acre
- Low – less than 0.5 persons per acre

With the assumption that higher population density supports a greater possibility of pedestrian and bicycle generated trips, the High Youth Population Density category receives the most points towards the overall Pedestrian/Bicycle Generator Score (see **Table 3**). Because the youth population has the greatest potential to perform a modal shift to walking and bicycling in the future, this indicator was assigned a weighted multiplier of 2.

### **Senior Population**

The County is aging in place and the median population density of the County’s seniors (65 years of age and older) is 0.4 persons per acre. Based on this information, groupings of High, Medium and Low Population Density were established.

- High – greater than 0.6 persons per acre
- Medium – between 0.3 and 0.6 persons per acre
- Low – less than 0.3 persons per acre

With the assumption that higher population density supports a greater possibility of pedestrian generated trips, the High Senior Population Density cohort receives the most points towards the overall Pedestrian/Bicycle Generator Score (see **Table 3**).

### **Median Household Income**

Annual income can be indicative of a household's economic means to provide personal transportation rather than relying on public transit and non-motorized transportation to complete trips. Median Household Income for Anne Arundel County was analyzed at the Census tract level using American Community Survey (ACS) 2011 5-Year Average. The median for all Census tracts was \$85,690. Based on this information, groupings of High, Medium and Low Median Household Income were established.

- High – greater than \$105,000 per year
- Medium – between \$65,000 and \$105,000 per year
- Low – less than \$65,000 per year

With the assumption that lower household income supports a greater possibility of pedestrian or bicycle generated trips, the Low Median Household Income cohort receives the most points towards the overall Pedestrian/Bicycle Generator Score (see **Table 3**).

An article published in the Rutgers paper (2011), correlates income to the mode of travel by stating: “[NATIONALLY] In 2001 there was almost no difference in bicycle mode shares among the four income quartiles. By comparison, the 2009 NHTS indicates a somewhat higher bicycle mode share in the lowest income quartile (1.3%) than in the top two income quartiles (1.0% and 1.1%, respectively). Although cycling rates do not vary much by income, it seems likely that low income persons cycle mainly for work trips and other utilitarian purposes [TRANSPORTATION ALTERNATIVES], while high-income persons may cycle more for recreation and exercise (Krizek et al., 2009; Heinen et al., 2010; Smart, 2010).”

Combining the various Pedestrian/Bicycle Generator Factors results in the composite ranking for the overall Pedestrian/Bicycle Needs Areas as illustrated in **Table 3**. Both Population Density and Youth Population were given a weighted score of 2 while the Senior Population and Median Household Income were given a weighted score of 1. This weighting is based on the greater likelihood of more densely populated areas and youth having a greater desire and need to generate pedestrian and bicycle trips.

### Pedestrian/Bicycle Attractors

Pedestrian/Bicycle Attractors are those areas which have the greatest potential for being the destination of walking or bicycle related trips. For this study, Anne Arundel County provided the study team with a list of 19 areas which have high potential for generating pedestrian and bicycle trips due to high employment density.

#### List of Pedestrian/Bicycle Attractors

- Annapolis Harbour Center
- Annapolis Towne Centre at Parole
- Anne Arundel Medical Center
- Arundel Mills Mall
- Baltimore Washington Medical Center
- Brandon Shores
- Brandon Woods/Energy Business Park
- BWI Airport
- Festival at Riva
- Forest Plaza
- Fort Meade
- Glen Burnie Town Center
- Marley Station Mall
- National Business Park
- Northrop Grumman
- Odenton Town Center
- Village at Waugh Chapel
- Village at Waugh Chapel South
- Westfield Annapolis Mall

Areas which were identified as Pedestrian/Bicycle Attractors automatically fall into the High category of Pedestrian/Bicycle Needs Areas. All areas identified as Pedestrian/Bicycle Attractors correspond to **Tier I** projects, the darkest color in **Figure 6**. All areas outside of Pedestrian/Bicycle Attractors will fall into either a Medium or Low Pedestrian/Bicycle Needs Area based upon their Pedestrian/Bicycle Generator Score.

### Pedestrian/Bicycle Needs Areas Defined

The weighted scores for population density, youth population density, senior population density and median household income are combined to yield the Pedestrian/Bicycle Needs Area scores for each Census tract. There is a maximum value of 18 points and a minimum value of 4 points. The median Pedestrian/Bicycle Needs Area score for all Census tracts in Anne Arundel County was 10 points. Based on this distribution, the following cohorts were developed which correspond to the Tier in which a project will be placed:

- High Pedestrian/Bicycle Needs Area (14 to 18 points) = **Tier I**
- Medium Pedestrian/Bicycle Needs Area (8 to 13 points) = **Tier II**
- Low Pedestrian/Bicycle Needs Area (4 to 7 points) = **Tier III**

## D. Evaluation Criteria

Evaluation Criteria were developed based on the jurisdictional research and interviews cited in **Appendix K**, public input from the Summer 2012 public meetings and Citizens Advisory Committee (CAC) input, input from Anne Arundel County, as well as the professional judgment of the planning team. The Evaluation Criteria were then applied to each project identified, following Prioritization. The results of the application of the Evaluation Criteria are discussed in Chapter V of the 2013 PBMP.

### 1. Development of Evaluation Criteria

The development of the Evaluation Criteria involved the following key milestones which are discussed in detail in *Evaluation Criteria Technical Memorandum 2* as well as in **Appendix L**:

- Public Meeting Outcome
- Selection of Evaluation Criteria
- Definition of Evaluation Criteria
- Benefits and Challenges of Evaluation Criteria

Based on the weighted ranking from the Summer 2012 public meetings, the list of preliminary Evaluation Criteria from the various sources, were separated into two basic categories: **Service and Structure**. These categories directly relate to the top priorities as defined by the public and re-stated by members of the CAC and are applicable to both pedestrian and bicycle projects.

**Service** – County-wide connectivity between trip generators/attractors or gaps in the existing pedestrian and bicycle network. Connections should be along a continuous linear network within a convenient distance to destinations, with a maximum **two-mile trip length**. A two-mile trip length was selected as a representation of the typical pedestrian and bicycle trip length. This is based on the typical walking trip length of one-half mile and the typical bicycle trip length of three miles.

As described later, these criteria will be used in an overall Evaluation Criteria Form that will rank each project within a Tier level. The final score that will be generated based on this Evaluation Criteria and used to rank the various projects evaluated will not include any multipliers to weight the various aspects of the criteria. Instead, the different destinations that a project may provide access to were broken out into separate components and by default become a weighted score based on the number of destinations to which a project may provide access. This was also done to help identify the destinations to aid in different funding opportunities (discussed in a later section) such as access for schools, transit or parklands.

### **Incorporation of Safety into the Evaluation Criteria**

**Safety** was the top priority for both the public and the CAC. There are two “types” of safety: an individual feeling “comfortable” on a given facility, such as a roadway or a trail, or an individual being physically safe. The same roadway or trail may seem “safe” to one user, while another user may experience a sense of harm. It is important to address both types of safety in order to create a pedestrian and bicycle network that is appealing to the maximum number of potential users.

When there is a quantitative measurement available to apply to Safety, it can be utilized in an evaluation. Other jurisdictions have used data sources, such as crash data, travel speeds, or traffic volumes, as quantitative measures of pedestrian and bicyclist safety. Typically, the quantitative measurement of Safety is in the form of crash data provided by the jurisdiction which maintains the roadway (e.g. County or State). Crash data can be a valuable quantifier and indicator of areas which may include hazards to pedestrian and bicycle safety, though not imperative as there are instances when crash data is not available or unreported. In these instances, other factors related to Safety are then evaluated.

At the time of this Master Plan no concise database of pedestrian and bicycle crash data was available for county roads to be incorporated into the Evaluation Criteria as a measure of Safety. The creation and ongoing maintenance of pedestrian and bicycle crash data in a geocoded database is included as recommendations in this Master Plan. **The Process used in the 2013 PBMP includes Safety as an integral component of the other two Evaluation Criteria identified by the public: Service and Structure.**

The **Service** component of the Evaluation Criteria considers county-wide access to destinations. These destinations have the greatest potential for attracting pedestrian and bicycle trips; and therefore, have the potential for higher pedestrian and bicycle volumes. As an example, if a potential project scores highly on the Service Evaluation Criteria (provides a missing link near a major generator), there is an implied improvement to the Safety of the facility since pedestrian and bicycle crashes are often dispersed in accordance with development patterns with increased crash activity in areas with increased residential and commercial density. Additionally, the provision of a dedicated pedestrian and/or bicycle facility compared to the shared-use of a facility primarily designed for motor vehicles reduces exposure and the potential for conflict (collision) and thus, improves safety.

The **Structure** component of the Evaluation Criteria considers the condition of an existing facility and the factors which may impact the improved condition of such a facility (e.g. available right of way, regulatory hurdles, constructability). A facility in need of a structural improvement may also include physical barriers or hazards to pedestrian and/or bicyclist safety. A potential project which improves the condition of a facility also addresses the safety of the facility.

The integration of Safety into Service and Structure is similarly illustrated by the Federal Highway Administration (FHWA). FHWA explains pedestrian safety by illustrating the different safety challenges faced by pedestrians through a number of objectives and countermeasures to achieve each objective ([http://www.walkinginfo.org/pedsafe/pedsafe\\_objectives.cfm](http://www.walkinginfo.org/pedsafe/pedsafe_objectives.cfm)). The guidance expands to note that every location (potential project) should be evaluated individually to consider the proper treatment(s) for that location. The treatments include elements within the Service and Structure criteria such as improvements through pedestrian facility design and traffic calming.



- **Completes a missing link** – Determine if installation of a sidewalk, shared-use path or roadway improvement would create a more continuous network to encourage safe and efficient walking and/or bicycling as a transportation alternative. These connections are generally less than one-quarter mile in length.
- **Provides access to Transit** – Determine if the project will improve efficiency to and from public transportation by walking or biking or if it will create a new means of getting to and from public transportation overall.
- **Provides access to Schools and/or Colleges** – Determine if the project will create a connection to an elementary, middle, high school or a college.
- **Provides access to a Recreational Facility** – Determine if the project will create a connection to a recreational facility such as a community recreational center, a senior center or a County park entrance.
- **Provides access to a Shopping Center** – Determine if the project will create a connection to a neighborhood retail area or a shopping center such as a mall or town center.
- **Provides access to Government Facilities** – Determine if the project will create a connection to a Federal, State, County or City building. This category also includes destinations such as libraries or post offices.
- **Enhances community/economic development objectives** – Determine if the project improves the surrounding area's intentions for growth with community needs and goals for safe and efficient non-motorized transportation. These projects may include those identified in a Small Area Plan.
- **Provides or enhances countywide and/or regional connectivity** – Determine if the project improves an existing network or creates a new network to conveniently serve the non-motorized needs of the surrounding areas. Such countywide and/or regional connections would generally be greater than one-quarter mile in length.

**Structure** – the condition of the existing facility, what is located at the existing facility. (e.g. curbs, shoulders, steep slopes).

- **Availability of public right-of-way (ROW)** – Determine if existing County, State or private development ROW is available to accommodate the project.
- **Avoids private right-of-way (ROW) or partnership with property owner** – Identify opportunities for partnership with private property owners.
- **Avoids or minimizes potential regulatory hurdles (e.g. National Environmental Policy Act (NEPA))** – Determine if the project is located within

an environmentally sensitive area that would require NEPA evaluation (for projects using Federal funding) or other environmental and/or regulatory permitting.

- **Short-term implementation** – Determine if the project would be able to be carried out in the short-term, defined as the first five years of the plan. These projects could include those currently identified in the County’s Capital Improvement Plan (CIP).
- **Constructability** – Determine the ease and efficiency with which a project can be built.

## 2. Application of Evaluation Criteria

A Project Evaluation Criteria Form was developed for use in the assessment of individual projects which have already been placed into a Tier based upon the Pedestrian/Bicycle Needs Area in the Prioritization step of the Process. **Figure 7** includes a blank example form.

The criteria were applied to all identified projects defined in Project Identification through the use of GIS information, online aerial mapping, and field research. In addition, a cursory environmental review was conducted for each project based on GIS data. The cursory environmental review entailed identifying mapped environmental data documented on the National Wetland Inventory (NWI) from the U.S. Fish and Wildlife Service, the Flood Insurance Rate Mapping (FIRM) maintained by the Federal Emergency Management Agency (FEMA), Critical Area Mapping maintained by the Maryland Department of Natural Resources (DNR) and Bog Wetland Mapping maintained by Anne Arundel County. Environmental features identified included streams, rivers, wetlands, floodplains, and the Chesapeake Bay Critical Area, as well as bog wetlands.

There are a total of eight (8) Evaluation Criteria for Service and five (5) Evaluation Criteria for Structure. Each criterion is assessed separately as described on the form. A project receives at least one (1) point for meeting a criterion; however, the “access to” criteria in the Service section can receive more than one point if a project connects more than one destination within a two-mile section.

These five (5) “access to” criteria include evaluating how a project improves access to different destinations in Anne Arundel County which have a high probability of attracting or generating pedestrian and bicycle trips. These destinations were developed based on a subset of the Anne Arundel County “Points of Interest” GIS shapefile as well as transit route data sourced from the Maryland Transit Administration (MTA), Washington Metropolitan Area Transit Authority (WMATA), Central Maryland Regional Transit (CMRT) and City of Annapolis Department of Transportation.

**Figure 7: Sample Evaluation Criteria Form**

**Anne Arundel County Pedestrian and Bicycle Master Plan**  
**Project Evaluation Criteria Form**

**Project #:**

**Project Name/Description:**

---

**SERVICE**

Completes a missing link  
(+1 max; link of 1/4 mi or less)

Provides access to transit  
(+1 for each transit route)

Provides access to an Elementary, Middle, High School or College  
(+1 for each school or college)

Provides access to a Recreational Facility  
(+1 for each Community Recreational Center, Senior Center, or Park Entrance)

Provides access to a Shopping Center  
(+1 for each Shopping Center)

Provides access to a Government Facility  
(+1 for each Government Facility)

Enhances community/economic development objectives  
(+1 max)

Provides or enhances countywide and/or regional network connectivity  
(+1 max; Greater than 1/4 mile link between networks)

**TOTAL**

**STRUCTURE (+1 max for each)**

Availability of public right-of-way (ROW)

Avoids private right-of-way (ROW) or has the potential for a partnership with the property owner

Avoids or minimizes potential regulatory hurdles

Short-term implementation

Constructability

**TOTAL**

**PROJECT EVALUATION CRITERIA SCORE (SERVICE + STRUCTURE)**

**TOTAL**

In order to acknowledge the number of destinations a project has the potential to connect, the project may receive more than one point for certain criteria if it connects to multiple trip generators. For example, if a project provides access to three (3) schools, that project would receive three (3) points for the criterion, “Provides access to a School and/or College”. The Project Evaluation Criteria Form provides instruction on which criterion are eligible for multiple points.

The final score that will be generated based on this Evaluation Criteria and used to rank the various projects evaluated will not include any multipliers to weight the various aspects of the criteria. Instead, the different destinations that a project may provide access to were broken out into separate components and by default become a weighted score based on the number of destinations to which a project may provide access. This was also done to help identify the destinations to aid in different funding opportunities (discussed in a later section) such as access for schools, transit or parklands.

Projects in the same Tier are then ranked according to their Project Evaluation Criteria Score. These ranked Tiers can be used by the County to aid in the determination of the future order of implementation for pedestrian and bicycle projects.

## E. Feasibility Level Cost Estimates

Cost has not specifically been included within the Process of evaluating and ranking projects, so as to ensure that all projects are understood for their value and potential use regardless of total capital cost. In addition, with the numerous funding sources and opportunities available through State, private and developer potential partnerships, as well as Federal grant resources, any project may have the potential to be built at any given time and can be selected from the total list based on funding opportunity.

Elements to be considered for the cost of projects are:

- **Cost estimate** – Determine right-of-way (ROW) needs and cost, as well as improvement cost to determine the required funding. Determine the required funding and funding sources.
- **Coordinated with a capital project** – Determine if the project can be combined with a larger project that is already planned or programmed or incorporated into ongoing maintenance operations.
- **Provided via private sector development** – Determine if the project is near a proposed residential, commercial or employment center project and can be incorporated into their proposed plans.
- **Grant eligibility** – Does the project qualify for funding through Federal, State or local grant resources? Are matching funds available?

While project cost is not included within the Process through which projects are identified, evaluated and ranked, feasibility/planning level cost estimates, located in **Appendix M**, were developed for each project in order to provide baseline figures for future planning and implementation efforts. **Appendix M** also includes additional project information including facility type.

Cost estimates were based upon project length in linear feet (LF) and unit costs which were developed for each of the different facility types and improvement options. For projects where specific site improvements were more relevant than project length or facility type (signing, structures, and signals), specific estimates were developed based upon best engineering judgment.

Unit costs per *Anne Arundel County Pedestrian/Transit Facility Access Improvements Multi-Year Project List*:

- 5 foot sidewalk at \$25/Linear Foot (LF)
- Feasibility Contingency at 40% Cost
- Right-of-way acquisition at 40% Cost
- Design at 5% Construction Cost

The feasibility/planning level cost estimates do not include costs for engineering, utility relocation, curb/gutter construction or stormwater management.

## **F. Project Opportunity**

A key element of this plan, as opposed to the 2003 Pedestrian Bicycle Master Plan (2003 PBMP), is the identification of specific pedestrian and bicycle related projects deemed credible of consideration for construction. Although the projects are stratified by the Prioritization Tier ranking system and Evaluation Criteria Scores, it should be noted that **all of the projects listed are worthy of advancement to the project development stage**.

The overriding intent in identifying these projects is the advancement to construction whenever an opportunity arises; be it through Federal/State funding, County Capital Project funding or as a condition of developmental approval. Proposed changes in County regulations introduced in this Plan, and if adopted, will also introduce the opportunity for construction of projects through the use of impact fees and/or off-site private construction mitigation projects. The opportunity to provide pedestrian and bicycle facilities in more densely populated areas of the County, in lieu of roadway improvements, could further promote changes in travel behavior and mode use. The identification of these projects is essential to ultimately improving pedestrian and bicycle connectivity within the higher density/populated portions of Anne Arundel County.

Furthermore, the Office of Planning and Zoning (OPZ) will have the ability to add projects to the list as opportunities arise, as the 2013 PBMP recommendations will be incorporated into the Transportation Functional Master Plan at a future date.

## V. Project Identification & Evaluation – Results

Following the development of the Process, each of the steps was implemented in order to determine the final list of Potential Pedestrian and Bicycle Improvements. By applying the steps of the Process, these potential projects are placed into Prioritization Tiers, and then are ranked by their Evaluation Criteria Scores.

**Table 4** includes a summary of the number of potential projects located within each of the Small Planning Areas as well as the breakdown of projects between County and State Jurisdiction. Maps of each project within a Small Planning Area are located in **Appendix N**.

**Table 4: Summary of Projects by Small Planning Area**

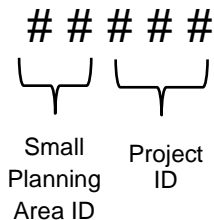
Small Planning Area	Small Planning Area ID		# Projects		
	County Projects	State Projects	County Projects	State Projects	Total Projects
Annapolis Neck	01	21	11	8	19
Broadneck	02	22	16	4	20
Brooklyn Park	03	23	0	4	4
Crofton	04	24	1	4	5
Crownsville	05	25	0	0	0
Deale/Shadyside	06	26	0	0	0
Edgewater/Mayo	07	27	0	3	3
Glen Burnie	08	28	2	13	15
Jessup/Maryland City	09	29	0	5	5
Lake Shore	10	30	1	3	4
Linthicum	11	31	4	5	9
Odenton	12	32	18	5	23
Pasadena/Marley Neck	13	33	2	8	10
Severn	14	34	1	5	6
Severna Park	15	35	18	5	23
South County	16	36	0	0	0

Much of the Crownsville, Deale/Shadyside and South County Small Planning Areas are located outside of the Planned Water and/or Sewer Areas of the County (outside of the urbanized area) which makes them outside of the study area for the 2013 PBMP. While no specific projects have been identified in these areas, a number of countywide non-infrastructure recommendations and other implementation strategies are included which will facilitate pedestrian and bicycle improvements throughout the entire county.

An additional limiting factor for many roadways in the non-urbanized areas is their classification as “Scenic and Historic Roads”. Legislation protects the scenic and historic fabric of the landscape of Anne Arundel County through regulating development along designated Scenic and Historic Roads. Development along roads designated as “scenic and historic” is guided by legislation which the Office of Planning & Zoning uses while working closely with developers, engineers, and traffic planners to ensure that historic and scenic roads are preserved while maintaining applicable safety standards. Compliance with Scenic and Historic Roads regulations is managed by the Cultural Resources Program.

Scenic and Historic Roads are identified in Anne Arundel County on an official map maintained by the Office of Planning and Zoning and by Ordinance 21-06. Generally, the County is limited in its ability to modify the current roadway of those facilities identified as Scenic and Historic unless the change in the roadway is directly associated with a safety issue. Many of these roadways are low-volume, rural collector-type facilities; however, other roadways such as Solomon’s Island Road (MD 2), a principal arterial roadway connecting Annapolis with Calvert County and located south of Central Avenue, also is identified as Scenic and Historic. The designation can limit the County’s ability to add pedestrian and bicycle supporting infrastructure or design changes.

Projects are labeled according to their Project Code. Project Codes were assigned based on Small Planning Area by the following 5-digit convention:



Separate Small Planning Area ID’s were assigned for projects along County Roads (both those within the In Master Plan and Feasible categories) versus State Roads.

The projects categorized as Outside Study Area and Dropped have not been evaluated; however, each project was assigned a 5-digit code where the first 2 digits are “XX”. Projects coded in the XX200’s correspond to the projects Outside Study Area. Projects coded in the XX300’s correspond to the projects that were dropped.

As discussed in Chapter IV, once the list of projects was finalized through Project Identification, each project was then placed into a Prioritization Tier. **Table 5** summarizes the total number of projects by Prioritization Tier. Additionally **Figures 8 through 10** illustrate the projects in Tiers I, II and III respectively, on a countywide basis. Overall, Tier II contains the majority of projects throughout urbanized Anne Arundel County.

**Table 5: Summary of Projects by Tier**

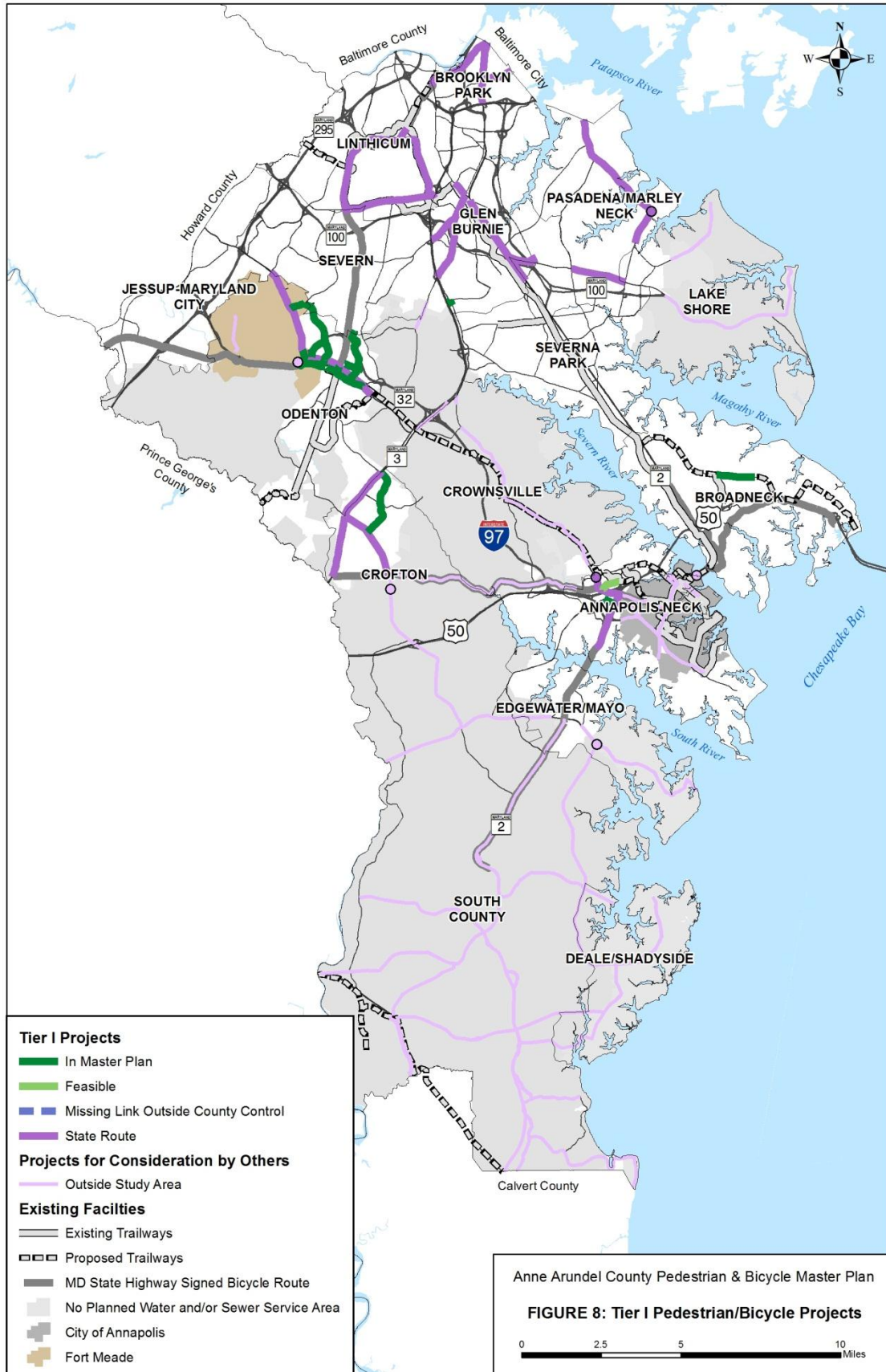
Prioritization Tier	Number of County Projects	Number of State Projects	Total Number of Projects
Tier I	18	23	41
Tier II	39	34	73
Tier III	17	15	32

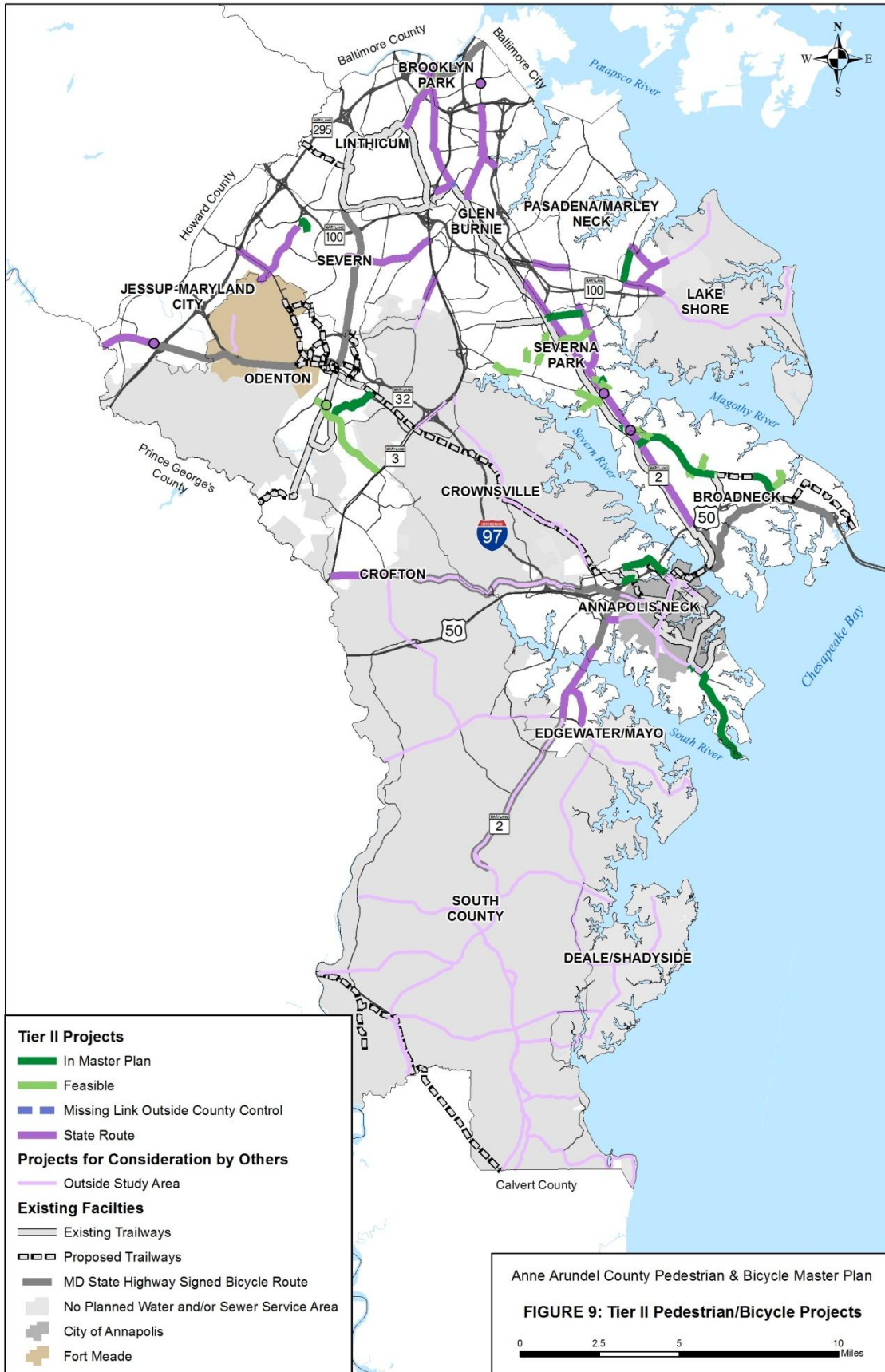
Following Prioritization, each project was evaluated to determine its Evaluation Criteria Score. Projects in the same Tier were then ranked according to their Project Evaluation Criteria Score. These ranked Tiers can be used by the County to aid in the determination of the future order of implementation for pedestrian and bicycle projects.

**Tables 6 through 8** (beginning on page 61) include a listing of projects by Prioritization Tier ranked according to their Evaluation Criteria Scores. A full listing of detailed Evaluation Criteria Scores is located in **Appendix O**.

**Tables 9 through 21** (beginning on page 73) include a listing of projects by Small Planning Area ranked according to their Evaluation Criteria Scores.







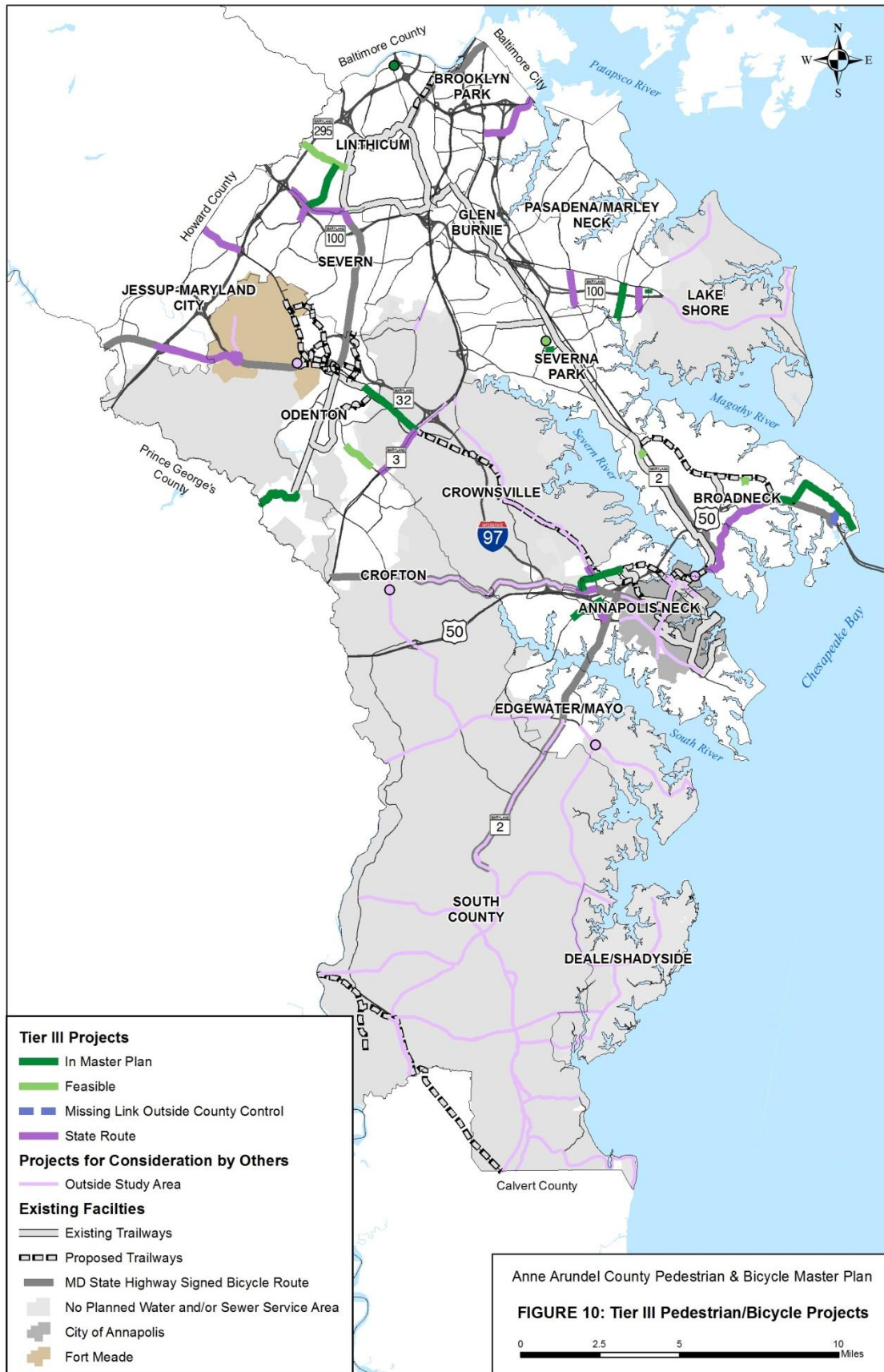


Table 6: Tier I Projects by Evaluation Criteria Score

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
31010	Linthicum	Aviation Blvd. (MD 162) / Telegraph Road (MD 170) / Dorsey Road (MD 176) - Bicycle improvements along Airport Loop.	I	26	4	30	\$ 187,000
28120	Glen Burnie	Governor Ritchie Highway (MD 2) from Baltimore Annapolis Blvd. (MD 648) to Jumpers Hole Road - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	I	26	2	28	\$ 1,709,000
28040	Glen Burnie	Crain Highway (MD 3) from Baltimore Annapolis Blvd (MD 648) to I-97 - Pedestrian and bicycle improvements.	I	25	2	27	\$ 1,643,000
01060	Annapolis Neck	Forest Drive - Part of a pedestrian/bicycle connection from Annapolis High School to downtown Annapolis. Includes filling missing sidewalk gaps as part of a FY12 CIP project. Connects with proposed bicycle facility along Forest Drive at County/City line.	I	17	5	22	\$ 111,000
32020	Odenton	Annapolis Road (MD 175) from Ridge Road (MD 713) to Telegraph Road (MD 170) - Pedestrian and bicycle improvements including bicycle lanes and a shared-use path along eastbound MD 175. Provide connections to MARC, Park-and-Ride and proposed Town Center. Portions in design.	I	21	1	22	\$ 2,368,000
33080	Pasadena/Marley Neck	Mountain Road (MD 177) from Solley Road to Catherine Avenue - Pedestrian improvements along the north side of the roadway. Bicycle improvements along northern side of roadway would require coordination with property owners.	I	20	2	22	\$ 489,000
04010	Crofton	Riedel Road - Pedestrian and bicycle enhancements from Davidsonville Road (MD 424) to Crain Highway (2003 Plan Tier 1).	I	17	4	21	\$ 257,000
12020	Odenton	Odenton Road - Construct missing sidewalk from the MARC Station to Higgins Drive. Portion included in FY13 CIP.	I	15	4	19	\$ 444,000
21050	Annapolis Neck	Generals Highway (MD 178) and West Street (MD 450) from Bestgate Road to Annapolis City Line - Pedestrian and bicycle improvements.	I	17	2	19	\$ 24,000
21080	Annapolis Neck	Solomons Island Road (MD 2) from Poplar Point Road to West Street (MD 450) - Pedestrian and bicycle improvements.	I	19	0	19	\$ 11,000
23040	Brooklyn Park	Governor Ritchie Highway (MD 2) from Belle Grove Road (MD 170) to I-695 - Pedestrian and bicycle improvements.	I	16	3	19	\$ 531,000
12010	Odenton	Odenton Road - Construct sidewalk from the MARC Station to Baldwin Road.	I	13	5	18	\$ 177,000

**Table 6: Tier I Projects by Evaluation Criteria Score (continued)**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
01100	Annapolis Neck	Jennifer Road - Pedestrian improvements from West Street (MD 450) to Medical Boulevard (BMC). Includes filling sidewalk gaps included in CIP project request.	I	12	5	17	\$ 155,000
33060	Pasadena/Marley Neck	Mountain Road (MD 177) from Catherine Avenue to Edwin Raynor Blvd - Pedestrian and bicycle improvements. Sidewalk along both sides of the roadway and bicycle lanes.	I	14	3	17	\$ 493,000
21040	Annapolis Neck	Generals Highway (MD 178) / Bestgate Road / Housley Road - Intersection improvements needed including new pedestrian facilities at intersection.	I	12	4	16	\$ 142,000
24010	Crofton	Crain Highway (MD 3) from Waugh Chapel Road to Defense Highway (MD 450) - Pedestrian and bicycle improvements. Include trail connection to Crofton Park-and-Ride and shared-use path along eastern side of MD 3.	I	14	2	16	\$ 2,017,000
33030	Pasadena/Marley Neck	Fort Smallwood Road (MD 173) from County Line to Edwin Raynor Boulevard - Bicycle improvements. Consider shoulder use.	I	13	3	16	\$ 92,000
01050	Annapolis Neck	Bestgate Road/Housley Road - Northern Loop from 2003 Ped/Bike Master Plan. Construct a shared-use trail by widening the existing sidewalk. Connects to proposed shared-lane markings on Ridgely Avenue in Annapolis City.	I	12	3	15	\$ 118,000
08020	Glen Burnie	Veterans Highway - Construct new sidewalk along Veterans Highway and Old Mill Road connecting Harpers Mill Community with Old Mill Road. Included in CIP project request.	I	10	5	15	\$ 40,000
12120	Odenton	Odenton Trail Phase 9 - Construct Phase 9 of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	11	4	15	\$ 70,000
28010	Glen Burnie	Baltimore Annapolis Blvd (MD 648) from 8th Ave NW to New Cut Road - Bicycle improvements.	I	13	2	15	\$ 304,000
24030	Crofton	Davidsonville Road (MD 424) from Riedel Road to Defense Highway (MD 450) - Pedestrian and bicycle improvements.	I	12	2	14	\$ 195,000
32030	Odenton	Annapolis Road (MD 175) from Telegraph Road (MD 170) to School Lane - Bicycle improvements.	I	10	4	14	\$ 522,000
24020	Crofton	Davidsonville Road (MD 424) from Crain Highway (MD 3) to Riedel Road - Pedestrian and bicycle improvements.	I	13	0	13	\$ 224,000
12040	Odenton	Odenton Trail Phase 10B/10E - Construct Phases 10B/10E of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	10	2	12	\$ 232,000

**Table 6: Tier I Projects by Evaluation Criteria Score (continued)**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
12110	Odenton	Odenton Trail Phase 5A - Construct Phase 5A of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	8	4	12	\$ 38,000
12090	Odenton	Odenton Trail Phase 4B - Construct Phase 4B of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	9	2	11	\$ 487,000
23010	Brooklyn Park	Belle Grove Road (MD 170) from Governor Ritchie Highway (MD 2) to Baltimore Annapolis Blvd (MD 648) - Pedestrian and bicycle improvements.	I	9	2	11	\$ 1,253,000
28100	Glen Burnie	Quarterfield Road (MD 174) from Crain Highway (MD 3) to I-97 - Pedestrian and bicycle improvements. Fill sidewalk gaps to destinations.	I	9	2	11	\$ 567,000
33070	Pasadena/ Marley Neck	Mountain Road (MD 177) from Governor Ritchie Highway (MD 2) to Baltimore Annapolis Blvd (MD 648) - Pedestrian and bicycle improvements. Sidewalk along the north side of the roadway and bicycle use along the shoulder.	I	8	3	11	\$ 17,000
23020	Brooklyn Park	Church Street (MD 171) from Governor Ritchie Highway (MD 2) to County Line - Bicycle improvements.	I	6	4	10	\$ 34,000
28030	Glen Burnie	Baltimore Annapolis Blvd (MD 648) from Mountain Road (MD 177) to Cedarcliff Drive - Bicycle improvements and sidewalk improvements along the east side of the roadway.	I	7	3	10	\$ 13,000
29050	Jessup - Maryland City	Rockenbach Road (MD 713) from Annapolis Road (MD 175) to Fort Meade - Bicycle improvements.	I	6	3	9	\$ 12,000
02090	Broadneck	Broadneck Trail Phase 2 - Construct the proposed Broadneck Trail from Bay Dale Drive to Green Holly Drive.	I	6	2	8	\$ 608,000
12050	Odenton	Odenton Trail Phase 10C - Construct Phase 10C of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	6	2	8	\$ 725,000
12070	Odenton	Odenton Trail Phase 3 - Construct Phase 3 of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	5	3	8	\$ 119,000
12080	Odenton	Odenton Trail Phase 4A - Construct Phase 4A of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	6	2	8	\$ 553,000
33020	Pasadena/ Marley Neck	Fort Smallwood Road (MD 173) / Bar Harbor Road - Intersection improvements for pedestrian facilities.	I	5	3	8	\$ 83,000

**Table 6: Tier I Projects by Evaluation Criteria Score (continued)**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
12060	Odenton	Odenton Trail Phase 2A/2B - Construct Phases 2A/2B of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	5	2	7	\$ 695,000
12100	Odenton	Odenton Trail Phase 4C - Construct Phase 4C of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	5	2	7	\$ 358,000
12030	Odenton	Odenton Trail Phase 10A/10D - Construct Phases 10A/10D of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	2	2	4	\$ 263,000

Table 7: Tier II Projects by Evaluation Criteria Score

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
35040	Severna Park	Governor Ritchie Highway (MD 2) from Jumpers Hole Road to Robinson Road - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	II	21	2	23	\$ 2,258,000
28060	Glen Burnie	Dorsey Road (MD 176) from I-97 to Baltimore Annapolis Blvd (MD 648) - Bicycle improvements.	II	18	4	22	\$ 15,000
28130	Glen Burnie	Governor Ritchie Highway (MD 2) from Furnace Branch Road (MD 270) to Baltimore Annapolis Blvd (MD 648) - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	II	18	3	21	\$ 1,079,000
01020	Annapolis Neck	Bay Ridge Road - Arundel on the Bay Road from Annapolis City/County line to Arundel on the Bay. Connects to proposed bike lanes along Bay Ridge Road in Annapolis. Includes Arundel on the Bay Sidewalk CIP project request.	II	15	5	20	\$ 52,000
28020	Glen Burnie	Baltimore Annapolis Blvd (MD 648) from I 97 to B&A Trail - Shared-use path extension of B&A Trail ultimately connecting to the Gwynns Falls Trail.	II	18	2	20	\$ 257,000
35050	Severna Park	Governor Ritchie Highway (MD 2) from Robinson Road to Jones Station Road - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	II	16	2	18	\$ 852,000
34040	Severn	Ridge Road (MD 713) from Stoney Run Road to Annapolis Road (MD 175) - Pedestrian and bicycle improvements.	II	14	3	17	\$ 52,000
01030	Annapolis Neck	Bestgate Road - Construct a shared-use trail by widening the existing sidewalk. Part of the proposed Colonial Annapolis Trail tying into the Annapolis Bicycle Master Plan.	II	13	3	16	\$ 248,000
08010	Glen Burnie	B&A Trail Extension - Provide a shared-use connection to the Cromwell Park-and-Ride from the B&A Trail along Baltimore Annapolis Boulevard.	II	13	3	16	\$ 40,000
11030	Linthicum	Light Rail Trail - Construct a shared-use path parallel to Camp Meade Road (MD 170) and provide connections to the Park-and-Ride facilities at the Nursery Road and the North Linthicum Light Rail stations.	II	15	1	16	\$ 675,000
22030	Broadneck	Governor Ritchie Highway (MD 2) from West Campus Drive to US 50 - Bicycle improvements.	II	12	4	16	\$ 46,000
12180	Odenton	WB&A Trail Spur - Construct Phase IV of the proposed WB&A Trail spur from Odenton Park to the proposed South Shore Trail.	II	13	2	15	\$ 885,000
15050	Severna Park	Evergreen Road - Sidewalk along southern side of road and crosswalks.	II	11	4	15	\$ 222,000
27010	Edgewater/ Mayo	Mayo Road (MD 253) from Solomons Island Road (MD 2) to Central Avenue (MD 214) - Upgraded pedestrian and bicycle facilities.	II	13	2	15	\$ 386,000
30030	Lake Shore	Mountain Road (MD 177) from Edwin Raynor Blvd to MD 100 - Pedestrian and bicycle improvements along the south side of the roadway.	II	13	2	15	\$ 27,000



Table 7: Tier II Projects by Evaluation Criteria Score (continued)

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
01090	Annapolis Neck	Jennifer Road - Construct a shared-use trail as part of the proposed Colonial Annapolis Trail from the existing trail limit at Pavilion Parkway to Admiral Drive.	II	12	2	14	\$ 204,000
14010	Severn	Ridge Chapel Road - Construct missing sidewalk gap to provide a pedestrian connection to Ridge Road.	II	10	4	14	\$ 67,000
29030	Jessup-Maryland City	Laurel Fort Meade Road (MD 198) from County Line to Russett Green East - Pedestrian and bicycle improvements.	II	10	4	14	\$ 1,051,000
33050	Pasadena/Marley Neck	Mountain Road (MD 177) from Baltimore Annapolis Blvd (MD 648) to Solley Road - Pedestrian improvements along the north side of the roadway for full limits and along south side of roadway for western segment.	II	13	1	14	\$ 612,000
12140	Odenton	Waugh Chapel Road Bicycle Lanes - Construct bicycle lanes from Piney Orchard Parkway to MD 3.	II	11	2	13	\$ 25,000
15060	Severna Park	Evergreen Road/Maple Avenue/Holly Avenue (Olde Severna Park) - Construct new sidewalk and upgrade existing sidewalk to be ADA compliant.	II	10	3	13	\$ 148,000
23030	Brooklyn Park	Governor Ritchie Highway (MD 2) / Hammonds Lane - Intersection improvements.	II	10	3	13	\$ 17,000
28110	Glen Burnie	Governor Ritchie Highway (MD 2) from I 695 to Furnace Branch Road (MD 270) - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	II	9	4	13	\$ 849,000
32010	Odenton	Annapolis Road (MD 175) from MD 295 to Ridge Road (MD 713) - Pedestrian and bicycle improvements including bicycle lanes and a shared-use path along eastbound MD 175.	II	12	1	13	\$ 663,000
35030	Severna Park	Governor Ritchie Highway (MD 2) / McKinsey Road - Intersection improvements for safe pedestrian and bicycle crossing.	II	10	3	13	\$ 131,000
02030	Broadneck	Arnold Elementary School Connection - Make elementary school connections off the proposed Broadneck Trail.	II	8	4	12	\$ 113,000
02050	Broadneck	Belvedere Elementary School Connection - Make elementary school connections off the proposed Broadneck Trail. Identified as a shared-use facility on Broadneck Trail Plan.	II	9	3	12	\$ 70,000
02130	Broadneck	Cape St. Claire Elementary School Connection - Make elementary school connections off the proposed Broadneck Trail. Includes sidewalk project included in FY13 CIP.	II	8	4	12	\$ 277,000
15070	Severna Park	Hoyle Lane - Construct a sidewalk connection to Jones Elementary School off the B&A Trail. Design included in FY12 CIP.	II	7	5	12	\$ 23,000
15160	Severna Park	Pasadena Road - Sidewalk/bicycle improvements - ultimately connecting the B&A Trail with Lake Waterford Park. Portion in FY13 CIP.	II	8	4	12	\$ 660,000
22020	Broadneck	Governor Ritchie Highway (MD 2) from Jones Station Road to West Campus Drive - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	II	10	2	12	\$ 534,000

**Table 7: Tier II Projects by Evaluation Criteria Score (continued)**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
27030	Edgewater/ Mayo	Solomons Island Road (MD 2) from Mayo Road to Central Avenue (MD 214) - Pedestrian and bicycle improvements.	II	8	4	12	\$ 1,044,000
34030	Severn	Quarterfield Road (MD 174) from Quarterfield Road to I 97 - Bicycle improvements.	II	8	4	12	\$ 17,000
02060	Broadneck	Broadneck Elementary School Connection - Make elementary school connection off the proposed Broadneck Trail (2 segments).	II	7	4	11	\$ 107,000
02100	Broadneck	Broadneck Trail Phase 3 - Construct the proposed Broadneck Trail from Peninsula Farm Road to Bay Dale Drive.	II	9	2	11	\$ 1,239,000
15150	Severna Park	McKinsey Road and Leelyn Drive - Construct sidewalk on McKinsey Road at Leelyn Drive and crosswalk.	II	6	5	11	\$ 6,000
24040	Crofton	Defense Highway (MD 450) from Crain Highway (MD 3) to Davidsonville Road (MD 424) - Bicycle improvements.	II	7	4	11	\$ 24,000
29020	Jessup-Maryland City	Laurel Fort Meade Road (MD 198) / Russett Green East - Intersection improvements for pedestrians and bicycles.	II	7	4	11	\$ 69,000
30010	Lake Shore	Fort Smallwood Road (MD 173) from Edwin Raynor Blvd to Water Oak Point Road - Bicycle Improvements	II	7	4	11	\$ 36,000
31030	Linthicum	Camp Meade Road (MD 170) from Baltimore Annapolis Blvd (MD 648) to BWI Trail - Pedestrian and bicycle improvements.	II	10	1	11	\$ 1,638,000
32040	Odenton	Crain Highway (MD 3) from I 97 to Pasture Brook Road - Pedestrian and bicycle improvements.	II	9	2	11	\$ 145,000
15120	Severna Park	Leelyn Drive - Construct sidewalk from McKinsey Road to Arundel Beach Road.	II	6	4	10	\$ 106,000
15130	Severna Park	Lynnwood Road - Sidewalk Improvements connecting the existing sidewalk along the rear of Severna Park Middle School with Kinder Road/Kinder Farm Park to the north.	II	6	4	10	\$ 102,000
27020	Edgewater/ Mayo	Solomons Island Road (MD 2) from bridge to Mayo Road - Bicycle improvements.	II	6	4	10	\$ 18,000
31020	Linthicum	B&A Boulevard (MD 648) from County Line to I 97 - Shared-use path extension of B&A Trail ultimately connecting to the Gwynns Falls Trail.	II	9	1	10	\$ 1,766,000
34020	Severn	Donaldson Avenue (MD 174) from Reece Road to Quarterfield Road (MD 174) - Bicycle improvements.	II	6	4	10	\$ 36,000
01080	Annapolis Neck	Hillsmere Drive - Construct a sidewalk connection to Quiet Waters Park. Included as a CIP project request. Requires coordination with City of Annapolis.	II	4	5	9	\$ 12,000

Table 7: Tier II Projects by Evaluation Criteria Score (continued)

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
02010	Broadneck	AACC Connection to B&A Trail (Interim) - Install wayfinding signage to designate Jones Station Road as the connection with AACC.	II	4	5	9	\$ 8,000
02040	Broadneck	Bay Dale Drive Bike Path - Extend the existing shared-use facility to the north by widening the existing sidewalk to connect with the College Parkway Shopping Center.	II	4	5	9	\$ 17,000
02110	Broadneck	Broadneck Trail Phase 4 - Construct the proposed Broadneck Trail from the B&A Trail to Peninsula Farm Road.	II	7	2	9	\$ 234,000
02140	Broadneck	College Parkway - Construct sidewalk along the south side of College Parkway connecting with MD 2. Included in CIP project request.	II	5	4	9	\$ 71,000
10010	Lake Shore	Edwin Raynor Boulevard - Construct sidewalk gaps between Fort Smallwood Road (MD 173) and Mountain Road (2003 Plan Tier 1).	II	7	2	9	\$ 323,000
15090	Severna Park	Jumpers Hole Road - Installation/improvement of pedestrian facilities (near Severna Park Middle School); existing easement along roadway; safety issue for students walking on narrow shoulders.	II	6	3	9	\$ 466,000
15140	Severna Park	Magothy Bridge Road - Complete shoulder improvements or sidewalks from B&A Boulevard to the trail access at Earleigh Heights.	II	6	3	9	\$ 478,000
21010	Annapolis Neck	Aris T. Allen Boulevard (MD 665) from Solomons Island Road (MD 2) to Annapolis City Limits - Shared-use path.	II	8	1	9	\$ 152,000
28050	Glen Burnie	Crain Highway (MD 3) from Governor Ritchie Highway (MD 2) to Furnace Branch Road (MD 270) - Pedestrian and bicycle improvements.	II	8	1	9	\$ 198,000
15030	Severna Park	Asbury Drive/ Leelyn Drive - Construct sidewalk to connect Asbury Drive with Leelyn Drive.	II	4	4	8	\$ 51,000
15170	Severna Park	Riggs Avenue - Complete sidewalk/crosswalk improvements along for ADA compliance.	II	5	3	8	\$ 131,000
28090	Glen Burnie	Furnace Branch Road (MD 270) from Governor Ritchie Highway (MD 2) to Arundel Expressway (MD 10) - Bicycle improvements.	II	4	4	8	\$ 2,258,000
30020	Lake Shore	Hogneck Road (MD 607) from Fort Smallwood Road (MD 173) to Mountain Road (MD 177) - Pedestrian and bicycle improvements.	II	5	3	8	\$ 565,000
31050	Linthicum	Nursery Road (MD 168) from I 695 to Baltimore Annapolis Blvd (MD 648) - Bicycle improvements.	II	4	4	8	\$ 20,000
35020	Severna Park	Governor Ritchie Highway (MD 2) / Jones Station Road - Intersection improvements for safe pedestrian and bicycle crossing.	II	4	4	8	\$ 29,000
02070	Broadneck	Broadneck Trail Phase 1A - Construct the proposed Broadneck Trail from Green Holly Drive to College Parkway East. Currently in construction.	II	4	3	7	\$ 438,000

**Table 7: Tier II Projects by Evaluation Criteria Score (continued)**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
15010	Severna Park	Arundel Beach Road - Construct new sidewalk along the south side of Arundel Beach Road connecting the West Ridge Community with existing sidewalk along Arundel Beach Road to the west. Phase I per CIP project request.	II	2	5	7	\$ 18,000
15020	Severna Park	Arundel Beach Road - Construct sidewalk along the south side of Arundel Beach Road from Kennedy Drive to Whittier Parkway per CIP request.	II	2	5	7	\$ 44,000
15040	Severna Park	Benfield Boulevard - Construct sidewalk or widen shoulder from Lakeland Road to West Benfield Boulevard.	II	6	1	7	\$ 270,000
15080	Severna Park	Jones Station Road - Widen sidewalk to provide a shared-use connection to the Severna Park Park-and-Ride.	II	3	4	7	\$ 5,000
15110	Severna Park	Leelyn Drive - Construct new sidewalk along the west side of Leelyn Drive connecting existing sidewalk located to the north to the Arundel Beach Road sidewalk improvements (Phase II per CIP)	II	2	5	7	\$ 14,000
21070	Annapolis Neck	Solomons Island Road (MD 2) from Poplar Point Road to bridge - Bicycle improvements.	II	4	3	7	\$ 13,000
35010	Severna Park	Baltimore & Annapolis Boulevard (MD 648) from Old Mill Road to Governor Ritchie Highway (MD 2) - Bicycle improvements along full limits and pedestrian improvements from Pasadena Road to Magothy Bridge Road.	II	5	2	7	\$ 320,000
01010	Annapolis Neck	Admiral Drive - Construct the proposed Colonial Annapolis Trail tying into the Annapolis Master Plan. Annapolis Bicycle Master Plan identifies short-term shared-lane markings and long-term shared-use trail.	II	3	2	5	\$ 49,000
01040	Annapolis Neck	Bestgate Road North/Ridgely Avenue - Northern Loop from 2003 Ped/Bike Master Plan. Annapolis Bicycle Master Plan shows proposed shared-lane markings extending via Ridgely Avenue into City of Annapolis.	II	2	2	4	\$ 8,000
12170	Odenton	WB&A Trail Access Improvement - Improve access to WB&A Trail where Old Waugh Chapel Road bridge crosses the trail.	II	1	3	4	\$ 494,000

**Table 8: Tier III Projects by Evaluation Criteria Score**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
01110	Annapolis Neck	Riva Road - Pedestrian/bicycle connection from Annapolis High School to downtown Annapolis. Connect to Forest Drive Improvements. Portion of sidewalk gaps included in FY12 CIP.	III	20	3	23	\$ 326,000
21030	Annapolis Neck	Defense Highway (MD 450) from Alton Road to Generals Highway (MD 178) - Bicycle improvements.	III	18	4	22	\$ 14,000
21060	Annapolis Neck	Generals Highway (MD 178) from Knollwood Drive to Bestgate Road - Bicycle improvements.	III	16	4	20	\$ 12,000
28080	Glen Burnie	East Ordinance Road (MD 710) from Governor Ritchie Highway (MD 2) to Arundel Expressway (MD 10) - Bicycle improvements.	III	11	4	15	\$ 11,000
01070	Annapolis Neck	Harry S Truman Parkway - Widen existing sidewalk and extend to provide a shared-use connection to the Harry S Truman Park-and-Ride.	III	10	4	14	\$ 57,000
33040	Pasadena/Marley Neck	Magothy Bridge Road (MD 607) from Magothy Beach Road to Mountain Road (MD 177) - Bicycle improvements.	III	10	4	14	\$ 13,000
34010	Severn	Arundel Mills Boulevard (MD 713) from Dorsey Road to Ridge Road - Bicycle improvements.	III	10	4	14	\$ 12,000
12150	Odenton	Waugh Chapel Road Sidewalk - Construct sidewalk along the south side of the roadway from Maytime Drive to Summerfield Road.	III	8	3	11	\$ 302,000
11010	Linthicum	BWI Trail Connection - Construct shared-use trail to connect the existing BWI Trail to proposed 4-Lane Hanover Road.	III	9	1	10	\$ 868,000
13020	Pasadena/Marley Neck	Magothy Bridge Road - Construct new sidewalks and ramps along the east side of Magothy Beach Road connecting the existing segments of the sidewalk near Lake Shore Plaza Shopping Center. Part of CIP project request.	III	5	5	10	\$ 30,000
21020	Annapolis Neck	Aris T. Allen Boulevard (MD 665) from US 50 Ramp to Solomons Island Road (MD 2) - Shared-use path.	III	8	2	10	\$ 603,000
28070	Glen Burnie	East Ordinance Road (MD 710) from Arundel Expressway (MD 10) to County Line - Bicycle improvements.	III	6	4	10	\$ 25,000
31040	Linthicum	Dorsey Road (MD 176) from Wright Road to Telegraph Road (MD 170) - Bicycle improvements.	III	6	4	10	\$ 39,000

**Table 8: Tier III Projects by Evaluation Criteria Score (continued)**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
11040	Linthicum	New Ridge Road - Construct sidewalk gaps between Dorsey Road and Stoney Run Road.	III	6	3	9	\$ 385,000
12130	Odenton	South Shore Trail - Construct northern portion of the proposed South Shore Trail to connect the Odenton Bike Path to the proposed MD 3/Crain Highway bicycle facility.	III	7	2	9	\$ 1,073,000
29010	Jessup-Maryland City	Annapolis Road (MD 175) from County Line to MD 295 - Bicycle improvements.	III	5	4	9	\$ 30,000
15180	Severna Park	West Earleigh Heights - Construct sidewalk along the south side of West Earleigh Heights Road connecting existing sidewalk to the east. In CIP.	III	3	5	8	\$ 71,000
22010	Broadneck	Baltimore Annapolis Boulevard (MD 648) from Governor Ritchie Highway (MD 2) to St. Margaret's Road (MD 179) - Bicycle improvements	III	4	4	8	\$ 19,000
22040	Broadneck	St. Margaret's Road (MD 179) from Baltimore Annapolis Blvd (MD 648) to Whitehall Road - Bicycle improvements.	III	5	3	8	\$ 21,000
29040	Jessup-Maryland City	Laurel Fort Meade Road (MD 198) from Russett Green East to Fort Meade - Sidewalk and shared-use path as part of MD 198 Project Planning Study (SHA).	III	8	0	8	\$ 1,758,000
02080	Broadneck	Broadneck Trail Phase 1B - Construct the proposed Broadneck Trail from College Parkway East to Bay Head Road.	III	4	3	7	\$ 397,000
02120	Broadneck	Broadneck Trail Phase 5 - Construct the proposed Broadneck Trail from Bay Head Park to Sandy Point Park.	III	6	1	7	\$ 1,483,000
02160	Broadneck	Windsor Farm Elementary School Connection - Make elementary school connections off the proposed Broadneck Trail	III	3	4	7	\$ 82,000
11020	Linthicum	Hammonds Ferry Road and Nursery Road (MD 168) Intersection - Install pedestrian improvements at intersection.	III	3	4	7	\$ 100,000
15100	Severna Park	Jumpers Hole Road at Kinder Farm Park - Install advance pedestrian crossing warning sign prior to entrance to park.	III	2	5	7	\$ 2,000
32050	Odenton	Crain Highway (MD 3) from Waugh Chapel Road to Millersville Road - Install shared-use path along northbound MD 3.	III	5	2	7	\$ 842,000

**Table 8: Tier III Projects by Evaluation Criteria Score (continued)**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
33010	Pasadena/Marley Neck	Baltimore Annapolis Boulevard (MD 648) from Mountain Road (MD 177) to Old Mill Road - Bicycle improvements.	III	3	4	7	\$ 25,000
02150	Broadneck	Oceanic Drive - Provide a connection to Sandy Point State Park from St. Margaret's Road via Oceanic Drive.	III	4	2	6	\$ 5,000
13010	Pasadena/Marley Neck	Edwin Raynor Boulevard - Construct sidewalk gap south of Mountain Road and consider bicycle use from Mountain Road to Magothy Bridge Road (2003 Plan Tier 1).	III	4	2	6	\$ 55,000
02020	Broadneck	AACC Connection to B&A Trail - Construct a shared-use path from West Campus Drive to the B&A Trail.	III	4	1	5	\$ 117,000
34050	Severn	Telegraph Road (MD 170) from Dorsey Road (MD 176) to Buckingham Place - Shared-use connection from Buckingham Place to BWI Trail.	III	3	2	5	\$ 178,000
12160	Odenton	WB & A Trail - Construct a shared-use trail extension to Prince George's County.	III	2	1	3	\$ 902,000

Table 9: Annapolis Neck Projects by Evaluation Criteria Score

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
01060	Annapolis Neck	Forest Drive - Part of a pedestrian/bicycle connection from Annapolis High School to downtown Annapolis. Includes filling missing sidewalk gaps as part of a FY12 CIP project. Connects with proposed bicycle facility along Forest Drive at County/City line.	I	17	5	22	\$ 111,000
21050	Annapolis Neck	Generals Highway (MD 178) and West Street (MD 450) from Bestgate Road to Annapolis City Line - Pedestrian and bicycle improvements.	I	17	2	19	\$ 683,000
21080	Annapolis Neck	Solomons Island Road (MD 2) from Poplar Point Road to West Street (MD 450) - Pedestrian and bicycle improvements.	I	19	0	19	\$ 1,110,000
01100	Annapolis Neck	Jennifer Road - Pedestrian improvements from West Street (MD 450) to Medical Boulevard (BMC). Includes filling sidewalk gaps included in CIP project request.	I	12	5	17	\$ 155,000
21040	Annapolis Neck	Generals Highway (MD 178) / Bestgate Road / Housley Road - Intersection improvements needed including new pedestrian facilities at intersection.	I	12	4	16	\$ 142,000
01050	Annapolis Neck	Bestgate Road/Housley Road - Northern Loop from 2003 Ped/Bike Master Plan. Construct a shared-use trail by widening the existing sidewalk. Connects to proposed shared-lane markings on Ridgely Avenue in Annapolis City.	I	12	3	15	\$ 118,000
01020	Annapolis Neck	Bay Ridge Road - Arundel on the Bay Road from Annapolis City/County line to Arundel on the Bay. Connects to proposed bike lanes along Bay Ridge Road in Annapolis. Includes Arundel on the Bay Sidewalk CIP project request.	II	15	5	20	\$ 52,000
01030	Annapolis Neck	Bestgate Road - Construct a shared-use path by widening the existing sidewalk. Part of the proposed Colonial Annapolis Trail tying into the Annapolis Bicycle Master Plan .	II	13	3	16	\$ 248,000
01090	Annapolis Neck	Jennifer Road - Construct a shared-use path as part of the proposed Colonial Annapolis Trail from the existing trail limit at Pavilion Parkway to Admiral Drive.	II	12	2	14	\$ 204,000
01080	Annapolis Neck	Hillsmere Drive - Construct a sidewalk connection to Quiet Waters Park. Included as a CIP project request. Requires coordination with City of Annapolis.	II	4	5	9	\$ 12,000
21010	Annapolis Neck	Aris T. Allen Boulevard (MD 665) from Solomons Island Road (MD 2) to Annapolis City Limits - Shared-use path.	II	8	1	9	\$ 152,000
21070	Annapolis Neck	Solomons Island Road (MD 2) from Poplar Point Road to bridge - Bicycle improvements.	II	4	3	7	\$ 13,000
01010	Annapolis Neck	Admiral Drive - Construct the proposed Colonial Annapolis Trail tying into the Annapolis Master Plan. Annapolis Bicycle Master Plan identifies short-term shared-lane markings and long-term shared-use trail.	II	3	2	5	\$ 49,000
01040	Annapolis Neck	Bestgate Road North/Ridgely Avenue - Northern Loop from 2003 Ped/Bike Master Plan. Annapolis Bicycle Master Plan shows proposed shared-lane markings extending via Ridgely Avenue into City of Annapolis.	II	2	2	4	\$ 8,000



**Table 9: Annapolis Neck Projects by Evaluation Criteria Score (continued)**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
01110	Annapolis Neck	Riva Road - Pedestrian/bicycle connection from Annapolis High School to downtown Annapolis. Connect to Forest Drive Improvements. Portion of sidewalk gaps included in FY12 CIP.	III	20	3	23	\$ 326,000
21030	Annapolis Neck	Defense Highway (MD 450) from Alton Road to Generals Highway (MD 178) - Bicycle improvements.	III	18	4	22	\$ 14,000
21060	Annapolis Neck	Generals Highway (MD 178) from Knollwood Drive to Bestgate Road - Bicycle improvements.	III	16	4	20	\$ 12,000
01070	Annapolis Neck	Harry S Truman Parkway - Widen existing sidewalk and extend to provide a shared-use connection to the Harry S Truman Park-and-Ride.	III	10	4	14	\$ 57,000
21020	Annapolis Neck	Aris T. Allen Boulevard (MD 665) from US 50 Ramp to Solomons Island Road (MD 2) - Shared-use path.	III	8	2	10	\$ 603,000

**Table 10: Broadneck Projects by Evaluation Criteria Score**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
02090	Broadneck	Broadneck Trail Phase 2 - Construct the proposed Broadneck Trail from Bay Dale Drive to Green Holly Drive.	I	6	2	8	\$ 608,000
22030	Broadneck	Governor Ritchie Highway (MD 2) from West Campus Drive to US 50 - Bicycle improvements.	II	12	4	16	\$ 46,000
02050	Broadneck	Belvedere Elementary School Connection - Make elementary school connections off the proposed Broadneck Trail. Identified as a shared-use facility on Broadneck Trail Plan.	II	9	3	12	\$ 70,000
02030	Broadneck	Arnold Elementary School Connection - Make elementary school connections off the proposed Broadneck Trail.	II	8	4	12	\$ 113,000
02130	Broadneck	Cape St. Claire Elementary School Connection - Make elementary school connections off the proposed Broadneck Trail. Includes sidewalk project included in FY13 CIP.	II	8	4	12	\$ 277,000
22020	Broadneck	Governor Ritchie Highway (MD 2) from Jones Station Road to West Campus Drive - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	II	10	2	12	\$ 534,000
02100	Broadneck	Broadneck Trail Phase 3 - Construct the proposed Broadneck Trail from Peninsula Farm Road to Bay Dale Drive.	II	9	2	11	\$ 1,239,000
02060	Broadneck	Broadneck Elementary School Connection - Make elementary school connection off the proposed Broadneck Trail (2 segments).	II	7	4	11	\$ 107,000
02010	Broadneck	AACC Connection to B&A Trail (Interim) - Install wayfinding signage to designate Jones Station Road as the connection with AACC.	II	4	5	9	\$ 8,000

Table 10: Broadneck Projects by Evaluation Criteria Score (continued)

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
02040	Broadneck	Bay Dale Drive Bike Path - Extend the existing shared-use facility to the north by widening the existing sidewalk to connect with the College Parkway Shopping Center.	II	4	5	9	\$ 17,000
02110	Broadneck	Broadneck Trail Phase 4 - Construct the proposed Broadneck Trail from the B&A Trail to Peninsula Farm Road.	II	7	2	9	\$ 234,000
02140	Broadneck	College Parkway - Construct sidewalk along the south side of College Parkway connecting with MD 2. Included in CIP request.	II	5	4	9	\$ 71,000
02070	Broadneck	Broadneck Trail Phase 1A - Construct the proposed Broadneck Trail from Green Holly Drive to College Parkway East. Currently in construction.	II	4	3	7	\$ 438,000
22010	Broadneck	Baltimore Annapolis Boulevard (MD 648) from Governor Ritchie Highway (MD 2) to St. Margaret's Road (MD 179) - Bicycle improvements.	III	4	4	8	\$ 19,000
22040	Broadneck	St. Margaret's Road (MD 179) from Baltimore Annapolis Blvd (MD 648) to Whitehall Road - Bicycle improvements.	III	5	3	8	\$ 21,000
02080	Broadneck	Broadneck Trail Phase 1B - Construct the proposed Broadneck Trail from College Parkway East to Bay Head Road.	III	4	3	7	\$ 397,000
02120	Broadneck	Broadneck Trail Phase 5 - Construct the proposed Broadneck Trail from Bay Head Park to Sandy Point Park.	III	6	1	7	\$ 1,483,000
02160	Broadneck	Windsor Farm Elementary School Connection - Make elementary school connections off the proposed Broadneck Trail.	III	3	4	7	\$ 82,000
02150	Broadneck	Oceanic Drive - Provide a connection to Sandy Point State Park from St. Margaret's Road via Oceanic Drive.	III	4	2	6	\$ 5,000
02020	Broadneck	AACC Connection to B&A Trail - Construct a shared-use path from West Campus Drive to the B&A Trail.	III	4	1	5	\$ 117,000

**Table 11: Brooklyn Park Projects by Evaluation Criteria Score**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
23040	Brooklyn Park	Governor Ritchie Highway (MD 2) from Belle Grove Road (MD 170) to I-695 - Pedestrian and bicycle improvements.	I	16	3	19	\$ 531,000
23010	Brooklyn Park	Belle Grove Road (MD 170) from Governor Ritchie Highway (MD 2) to Baltimore Annapolis Blvd (MD 648) - Pedestrian and bicycle improvements.	I	9	2	11	\$ 1,253,000
23020	Brooklyn Park	Church Street (MD 171) from Governor Ritchie Highway (MD 2) to County Line - Bicycle improvements.	I	6	4	10	\$ 34,000
23030	Brooklyn Park	Governor Ritchie Highway (MD 2) / Hammonds Lane - Intersection improvements.	II	10	3	13	\$ 17,000

**Table 12: Crofton Projects by Evaluation Criteria Score**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
04010	Crofton	Riedel Road - Pedestrian and bicycle enhancements from Davidsonville Road (MD 424) to Crain Highway (2003 Plan Tier 1).	I	17	4	21	\$ 257,000
24010	Crofton	Crain Highway (MD 3) from Waugh Chapel Road to Defense Highway (MD 450) - Pedestrian and bicycle improvements. Include shared-use connection to Crofton Park-and-Ride and shared-use path along eastern side of MD 3.	I	14	2	16	\$ 2,017,000
24030	Crofton	Davidsonville Road (MD 424) from Riedel Road to Defense Highway (MD 450) - Pedestrian and bicycle improvements.	I	12	2	14	\$ 195,000
24020	Crofton	Davidsonville Road (MD 424) from Crain Highway (MD 3) to Riedel Road - Pedestrian and bicycle improvements.	I	13	0	13	\$ 224,000
24040	Crofton	Defense Highway (MD 450) from Crain Highway (MD 3) to Davidsonville Road (MD 424) - Bicycle improvements.	II	7	4	11	\$ 24,000

**Table 13: Edgewater/Mayo Projects by Evaluation Criteria Score**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
27010	Edgewater/Mayo	Mayo Road (MD 253) from Solomons Island Road (MD 2) to Central Avenue (MD 214) - Upgraded pedestrian and bicycle facilities.	II	13	2	15	\$ 386,000
27030	Edgewater/Mayo	Solomons Island Road (MD 2) from Mayo Road to Central Avenue (MD 214) - Pedestrian and bicycle improvements.	II	8	4	12	\$ 1,044,000
27020	Edgewater/Mayo	Solomons Island Road (MD 2) from bridge to Mayo Road - Bicycle improvements.	II	6	4	10	\$ 18,000

Table 14: Glen Burnie Projects by Evaluation Criteria Score

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
28120	Glen Burnie	Governor Ritchie Highway (MD 2) from Baltimore Annapolis Blvd. (MD 648) to Jumpers Hole Road - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	I	26	2	28	\$ 1,709,000
28040	Glen Burnie	Crain Highway (MD 3) from Baltimore Annapolis Blvd (MD 648) to I-97 - Pedestrian and bicycle improvements.	I	25	2	27	\$ 1,643,000
08020	Glen Burnie	Veterans Highway - Construct new sidewalk along Veterans Highway and Old Mill Road connecting Harpers Mill Community with Old Mill Road. Included in CIP request.	I	10	5	15	\$ 40,000
28010	Glen Burnie	Baltimore Annapolis Blvd (MD 648) from 8th Ave NW to New Cut Road - Bicycle improvements.	I	13	2	15	\$ 304,000
28100	Glen Burnie	Quarterfield Road (MD 174) from Crain Highway (MD 3) to I 97 - Pedestrian and bicycle improvements. Fill sidewalk gaps to destinations.	I	9	2	11	\$ 567,000
28030	Glen Burnie	Baltimore Annapolis Blvd (MD 648) from Mountain Road (MD 177) to Cedarcliff Drive - Bicycle improvements and sidewalk improvements along the east side of the roadway.	I	7	3	10	\$ 128,000
28060	Glen Burnie	Dorsey Road (MD 176) from I-97 to Baltimore Annapolis Blvd (MD 648) - Bicycle improvements.	II	18	4	22	\$ 15,000
28130	Glen Burnie	Governor Ritchie Highway (MD 2) from Furnace Branch Road (MD 270) to Baltimore Annapolis Blvd (MD 648) - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	II	18	3	21	\$ 1,079,000
28020	Glen Burnie	Baltimore Annapolis Blvd (MD 648) from I 97 to B&A Trail - Shared-use path extension of B&A Trail ultimately connecting to the Gwynns Falls Trail.	II	18	2	20	\$ 257,000
08010	Glen Burnie	B&A Trail Extension - Provide a shared-use connection to the Cromwell Park-and-Ride from the B&A Trail along Baltimore Annapolis Boulevard.	II	13	3	16	\$ 40,000
28110	Glen Burnie	Governor Ritchie Highway (MD 2) from I 695 to Furnace Branch Road (MD 270) - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	II	9	4	13	\$ 849,000
28050	Glen Burnie	Crain Highway (MD 3) from Governor Ritchie Highway (MD 2) to Furnace Branch Road (MD 270) - Pedestrian and bicycle improvements.	II	8	1	9	\$ 198,000
28090	Glen Burnie	Furnace Branch Road (MD 270) from Governor Ritchie Highway (MD 2) to Arundel Expressway (MD 10) - Bicycle improvements.	II	4	4	8	\$ 13,000
28080	Glen Burnie	East Ordinance Road (MD 710) from Governor Ritchie Highway (MD 2) to Arundel Expressway (MD 10) - Bicycle improvements.	III	11	4	15	\$ 11,000
28070	Glen Burnie	East Ordinance Road (MD 710) from Arundel Expressway (MD 10) to County Line - Bicycle improvements.	III	6	4	10	\$ 25,000

**Table 15: Jessup-Maryland City Projects by Evaluation Criteria Score**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
29050	Jessup - Maryland City	Rockenbach Road (MD 713) from Annapolis Road (MD 175) to Fort Meade - Bicycle improvements.	I	6	3	9	\$ 12,000
29030	Jessup - Maryland City	Laurel Fort Meade Road (MD 198) from County Line to Russett Green East - Pedestrian and bicycle improvements.	II	10	4	14	\$ 1,051,000
29020	Jessup - Maryland City	Laurel Fort Meade Road (MD 198) / Russett Green East - Intersection improvements for pedestrians and bicycles.	II	7	4	11	\$ 69,000
29010	Jessup - Maryland City	Annapolis Road (MD 175) from County Line to MD 295 - Bicycle improvements.	III	5	4	9	\$ 30,000
29040	Jessup - Maryland City	Laurel Fort Meade Road (MD 198) from Russett Green East to Fort Meade - Sidewalk and shared-use path as part of MD 198 Project Planning Study (SHA).	III	8	0	8	\$ 1,758,000

**Table 16: Lake Shore Projects by Evaluation Criteria Score**

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
30030	Lake Shore	Mountain Road (MD 177) from Edwin Raynor Blvd to MD 100 - Pedestrian and bicycle improvements along the south side of the roadway.	II	13	2	15	\$ 372,000
30010	Lake Shore	Fort Smallwood Road (MD 173) from Edwin Raynor Blvd to Water Oak Point Road - Bicycle Improvements	II	7	4	11	\$ 36,000
10010	Lake Shore	Edwin Raynor Boulevard - Construct sidewalk gaps between Fort Smallwood Road (MD 173) and Mountain Road (2003 Plan Tier 1).	II	7	2	9	\$ 323,000
30020	Lake Shore	Hogneck Road (MD 607) from Fort Smallwood Road (MD 173) to Mountain Road (MD 177) - Pedestrian and bicycle improvements.	II	5	3	8	\$ 565,000

Table 17: Linthicum Projects by Evaluation Criteria Score

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
31010	Linthicum	Aviation Blvd. (MD 162) / Telegraph Road (MD 170) / Dorsey Road (MD 176) - Bicycle improvements along Airport Loop.	I	26	4	30	\$ 187,000
11030	Linthicum	Light Rail Trail - Construct a shared-use path parallel to Camp Meade Road (MD 170) and provide connections to the Park-and-Ride facilities at the Nursery Road and the North Linthicum Light Rail stations.	II	15	1	16	\$ 675,000
31030	Linthicum	Camp Meade Road (MD 170) from Baltimore Annapolis Blvd (MD 648) to BWI Trail - Pedestrian and bicycle improvements.	II	10	1	11	\$ 1,638,000
31020	Linthicum	B&A Boulevard (MD 648) from County Line to I 97 - Shared-use path extension of B&A Trail ultimately connecting to the Gwynns Falls Trail.	II	9	1	10	\$ 1,766,000
31050	Linthicum	Nursery Road (MD 168) from I 695 to Baltimore Annapolis Blvd (MD 648) - Bicycle improvements.	II	4	4	8	\$ 20,000
11010	Linthicum	BWI Trail Connection - Construct shared-use trail to connect the existing BWI Trail to proposed 4-Lane Hanover Road.	III	9	1	10	\$ 868,000
31040	Linthicum	Dorsey Road (MD 176) from Wright Road to Telegraph Road (MD 170) - Bicycle improvements.	III	6	4	10	\$ 39,000
11040	Linthicum	New Ridge Road - Construct sidewalk gaps between Dorsey Road and Stoney Run Road.	III	6	3	9	\$ 385,000
11020	Linthicum	Hammonds Ferry Road and Nursery Road (MD 168) Intersection - Install pedestrian improvements at intersection.	III	3	4	7	\$ 100,000

Table 18: Odenton Projects by Evaluation Criteria Score

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
32020	Odenton	Annapolis Road (MD 175) from Ridge Road (MD 713) to Telegraph Road (MD 170) - Pedestrian and bicycle improvements including bicycle lanes and a shared-use path along eastbound MD 175. Provide connections to MARC, Park-and-Ride and proposed Town Center. Portions in design.	I	21	1	22	\$ 2,368,000
12020	Odenton	Odenton Road - Construct sidewalk from the MARC Station to Baldwin Road.	I	15	4	19	\$ 177,000
12010	Odenton	Odenton Road - Construct missing sidewalk from the MARC Station to Higgins Drive. Portion included in FY13 CIP.	I	13	5	18	\$ 444,000
12120	Odenton	Odenton Trail Phase 9 - Construct Phase 9 of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	11	4	15	\$ 70,000
32030	Odenton	Annapolis Road (MD 175) from Telegraph Road (MD 170) to School Lane - Bicycle improvements.	I	10	4	14	\$ 522,000
12040	Odenton	Odenton Trail Phase 10B/10E - Construct Phases 10B/10E of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	10	2	12	\$ 232,000
12110	Odenton	Odenton Trail Phase 5A - Construct Phase 5A of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	8	4	12	\$ 38,000
12090	Odenton	Odenton Trail Phase 4B - Construct Phase 4B of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	9	2	11	\$ 487,000
12050	Odenton	Odenton Trail Phase 10C - Construct Phase 10C of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	6	2	8	\$ 725,000
12070	Odenton	Odenton Trail Phase 3 - Construct Phase 3 of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	5	3	8	\$ 119,000
12080	Odenton	Odenton Trail Phase 4A - Construct Phase 4A of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	6	2	8	\$ 553,000
12060	Odenton	Odenton Trail Phase 2A/2B - Construct Phases 2A/2B of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	5	2	7	\$ 695,000
12100	Odenton	Odenton Trail Phase 4C - Construct Phase 4C of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	5	2	7	\$ 358,000
12030	Odenton	Odenton Trail Phase 10A/10D - Construct Phases 10A/10D of the Odenton Trail per the 2007 Odenton Trails Schematic Plan.	I	2	2	4	\$ 263,000
12180	Odenton	WB&A Trail Spur - Construct Phase IV of the proposed WB&A Trail spur from Odenton Park to the proposed South Shore Trail.	II	13	2	15	\$ 885,000

Table 18: Odenton Projects by Evaluation Criteria Score (continued)

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
12140	Odenton	Waugh Chapel Road Bicycle Lanes - Construct bicycle lanes from Piney Orchard Parkway to MD 3.	II	11	2	13	\$ 25,000
32010	Odenton	Annapolis Road (MD 175) from MD 295 to Ridge Road (MD 713) - Pedestrian and bicycle improvements including bicycle lanes and a shared-use path along eastbound MD 175.	II	12	1	13	\$ 663,000
32040	Odenton	Crain Highway (MD 3) from I 97 to Pasture Brook Road - Pedestrian and bicycle improvements.	II	9	2	11	\$ 145,000
12170	Odenton	WB&A Trail Access Improvement - Improve access to WB&A Trail where Old Waugh Chapel Road bridge crosses the trail.	II	1	3	4	\$ 494,000
12150	Odenton	Waugh Chapel Road Sidewalk - Construct sidewalk along the south side of the roadway from Maytime Drive to Summerfield Road.	III	8	3	11	\$ 302,000
12130	Odenton	South Shore Trail - Construct northern portion of the proposed South Shore Trail to connect the Odenton Bike Path to the proposed MD 3/Crain Highway bicycle facility.	III	7	2	9	\$ 1,073,000
32050	Odenton	Crain Highway (MD 3) from Waugh Chapel Road to Millersville Road - Install shared-use path along northbound MD 3.	III	5	2	7	\$ 842,000
12160	Odenton	WB & A Trail - Construct a shared-use trail extension to Prince George's County.	III	2	1	3	\$ 902,000



Table 19: Pasadena/Marley Neck Projects by Evaluation Criteria Score

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
33080	Pasadena/Marley Neck	Mountain Road (MD 177) from Solley Road to Catherine Avenue - Pedestrian improvements along the north side of the roadway. Bicycle improvements along northern side of roadway would require coordination with property owners.	I	20	2	22	\$ 489,000
33060	Pasadena/Marley Neck	Mountain Road (MD 177) from Catherine Avenue to Edwin Raynor Blvd - Pedestrian and bicycle improvements. Sidewalk along both sides of the roadway and bicycle lanes.	I	14	3	17	\$ 493,000
33030	Pasadena/Marley Neck	Fort Smallwood Road (MD 173) from County Line to Edwin Raynor Boulevard - Bicycle improvements. Consider shoulder use.	I	13	3	16	\$ 92,000
33070	Pasadena/Marley Neck	Mountain Road (MD 177) from Governor Ritchie Highway (MD 2) to Baltimore Annapolis Blvd (MD 648) - Pedestrian and bicycle improvements. Sidewalk along the north side of the roadway and bicycle use along the shoulder.	I	8	3	11	\$ 645,000
33020	Pasadena/Marley Neck	Fort Smallwood Road (MD 173) / Bar Harbor Road - Intersection improvements for pedestrian facilities.	I	5	3	8	\$ 83,000
33050	Pasadena/Marley Neck	Mountain Road (MD 177) from Baltimore Annapolis Blvd (MD 648) to Solley Road - Pedestrian improvements along the north side of the roadway for full limits and along south side of roadway for western segment.	II	13	1	14	\$ 612,000
33040	Pasadena/Marley Neck	Magothy Bridge Road (MD 607) from Magothy Beach Road to Mountain Road (MD 177) - Bicycle improvements.	III	10	4	14	\$ 13,000
13020	Pasadena/Marley Neck	Magothy Bridge Road - Construct new sidewalks and ramps along the east side of Magothy Beach Road connecting the existing segments of the sidewalk near Lake Shore Plaza Shopping Center. Part of CIP request.	III	5	5	10	\$ 30,000
33010	Pasadena/Marley Neck	Baltimore Annapolis Boulevard (MD 648) from Mountain Road (MD 177) to Old Mill Road - Bicycle improvements.	III	3	4	7	\$ 25,000
13010	Pasadena/Marley Neck	Edwin Raynor Boulevard - Construct sidewalk gap south of Mountain Road and consider bicycle use from Mountain Road to Magothy Bridge Road (2003 Plan Tier 1).	III	4	2	6	\$ 55,000

Table 20: Severn Projects by Evaluation Criteria Score

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
34040	Severn	Ridge Road (MD 713) from Stoney Run Road to Annapolis Road (MD 175) - Pedestrian and bicycle improvements.	II	14	3	17	\$ 52,000
14010	Severn	Ridge Chapel Road - Construct missing sidewalk gap to provide a pedestrian connection to Ridge Road.	II	10	4	14	\$ 67,000
34030	Severn	Quarterfield Road (MD 174) from Quarterfield Road to I97 - Bicycle improvements.	II	8	4	12	\$ 17,000
34020	Severn	Donaldson Avenue (MD 174) from Reece Road to Quarterfield Road (MD 174) - Bicycle improvements.	II	6	4	10	\$ 36,000
34010	Severn	Arundel Mills Boulevard (MD 713) from Dorsey Road to Ridge Road - Bicycle improvements.	III	10	4	14	\$ 12,000
34050	Severn	Telegraph Road (MD 170) from Dorsey Road (MD 176) to Buckingham Place - Shared-use connection from Buckingham Place to BWI Trail.	III	3	2	5	\$ 178,000

Table 21: Severna Park Projects by Evaluation Criteria Score

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
35040	Severna Park	Governor Ritchie Highway (MD 2) from Jumpers Hole Road to Robinson Road - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	II	21	2	23	\$ 2,258,000
35050	Severna Park	Governor Ritchie Highway (MD 2) from Robinson Road to Jones Station Road - Pedestrian and bicycle improvements. Fill sidewalk gaps as identified in the MD 2 Corridor Sidewalk Study.	II	16	2	18	\$ 852,000
15050	Severna Park	Evergreen Road - Sidewalk along southern side of road and crosswalks.	II	11	4	15	\$ 222,000
15060	Severna Park	Evergreen Road/Maple Avenue/Holly Avenue (Olde Severna Park) - Construct new sidewalk and upgrade existing sidewalk to be ADA compliant.	II	10	3	13	\$ 148,000
35030	Severna Park	Governor Ritchie Highway (MD 2) / McKinsey Road - Intersection improvements for safe pedestrian and bicycle crossing.	II	10	3	13	\$ 131,000
15070	Severna Park	Hoyle Lane - Construct a sidewalk connection to Jones Elementary School off the B&A Trail. Design included in FY12 CIP.	II	7	5	12	\$ 23,000
15160	Severna Park	Pasadena Road - Sidewalk/bicycle improvements - ultimately connecting the B&A Trail with Lake Waterford Park. Portion in FY13 CIP.	II	8	4	12	\$ 660,000
15150	Severna Park	McKinsey Road and Leelyn Drive - Construct sidewalk on McKinsey Road at Leelyn Drive and crosswalk.	II	6	5	11	\$ 6,000

Table 21: Severna Park Projects by Evaluation Criteria Score (continued)

Project Code	Small Planning Area	Project Description	Project Prioritization Tier	Service Total	Structure Total	Evaluation Criteria Score	Feasibility Level Cost Estimate
15120	Severna Park	Leelyn Drive - Construct sidewalk from McKinsey Road to Arundel Beach Road.	II	6	4	10	\$ 106,000
15130	Severna Park	Lynnwood Road - Sidewalk Improvements connecting the existing sidewalk along the rear of Severna Park Middle School with Kinder Road/Kinder Farm Park to the north.	II	6	4	10	\$ 102,000
15090	Severna Park	Jumpers Hole Road - Installation/improvement of pedestrian facilities (near Severna Park Middle School); existing easement along roadway; safety issue for students walking on narrow shoulders	II	6	3	9	\$ 466,000
15140	Severna Park	Magothy Bridge Road - Complete shoulder improvements or sidewalks from B&A Boulevard to the trail access at Earleigh Heights.	II	6	3	9	\$ 478,000
15030	Severna Park	Asbury Drive/ Leelyn Drive - Construct sidewalk to connect Asbury Drive with Leelyn Drive.	II	4	4	8	\$ 51,000
15170	Severna Park	Riggs Avenue - Complete sidewalk/crosswalk improvements along roadway for ADA compliance.	II	5	3	8	\$ 131,000
35020	Severna Park	Governor Ritchie Highway (MD 2) / Jones Station Road - Intersection improvements for safe pedestrian and bicycle crossing.	II	4	4	8	\$ 29,000
15010	Severna Park	Arundel Beach Road - Construct new sidewalk along the south side of Arundel Beach Road connecting the West Ridge Community with existing sidewalk along Arundel Beach Road to the west. Phase I per CIP request.	II	2	5	7	\$ 18,000
15020	Severna Park	Arundel Beach Road - Construct sidewalk along the south side of Arundel Beach Road from Kennedy Drive to Whittier Parkway per CIP request.	II	2	5	7	\$ 44,000
15040	Severna Park	Benfield Boulevard - Construct sidewalk or widen shoulder from Lakeland Road to West Benfield Boulevard.	II	6	1	7	\$ 270,000
15080	Severna Park	Jones Station Road - Widen sidewalk to provide a shared-use connection to the Severna Park Park-and-Ride	II	3	4	7	\$ 5,000
15110	Severna Park	Leelyn Drive - Construct new sidewalk along the west side of Leelyn Drive connecting existing sidewalk located to the north to the Arundel Beach Road sidewalk improvements. Phase II per CIP request.	II	2	5	7	\$ 14,000
35010	Severna Park	Baltimore & Annapolis Boulevard (MD 648) from Old Mill Road to Governor Ritchie Highway (MD 2) - Bicycle improvements along full limits and pedestrian improvements from Pasadena Road to Magothy Bridge Road.	II	5	2	7	\$ 320,000
15180	Severna Park	West Earleigh Heights - Construct sidewalk along the south side of West Earleigh Heights Road connecting existing sidewalk to the east. In CIP request.	III	3	5	8	\$ 71,000
15100	Severna Park	Jumpers Hole Road at Kinder Farm Park - Install advance pedestrian crossing warning sign prior to entrance to park.	III	2	5	7	\$ 2,000

## VI. Policy, Administrative & Regulatory Recommendations

The following recommendations were developed to provide Anne Arundel County with specific changes to policies and regulations that will encourage walking and bicycling as part of the intermodal transportation system to be included as part of the 2013 Pedestrian and Bicycle Master Plan (2013 PBMP). These policy changes and recommendations are a first step toward implementing a revised political and technical framework which includes the consideration of pedestrian and bicycle facilities throughout all stages of the development process. These policy recommendations should be considered in tandem with the other recommendations included in this Plan. Changes in policy, accompanied by strategic project planning, will provide the best chance for the County to implement as many transportation alternatives as possible in the ten-year planning horizon.

Existing master plans were reviewed to determine their impact, if any, on policies for pedestrian and bicycle facility implementation. The following policy documents were then reviewed and evaluated to determine recommended changes:

- Anne Arundel County Design Manual
- Anne Arundel County Code:
  - Subdivision and Development Regulations
  - Zoning
- Anne Arundel County Landscape Manual

In the course of developing these recommendations, interviews were conducted with four (4) individuals from three (3) adjacent jurisdictions on their own policies pertaining to pedestrian and bicycle facilities. The full findings from these interviews and research are located in **Appendix P**. The review of other jurisdictions' policy recommendations assists Anne Arundel County in evaluating current policies and developing new approaches to implementing policy standards which strengthen the requirement to provide pedestrian and bicycle facilities. One such new approach to policy for pedestrian and bicycle planning is the consideration of a Complete Streets Policy. Recommendations for a new Complete Streets Policy are included within the policy recommendations of this memorandum and are recommended to be included in the Anne Arundel County Complete Streets efforts currently underway.

Additionally, through the interview process, it became clear that there is no one process that works for all situations or jurisdictions. The approach used by a particular jurisdiction is fully dependent on the specific goals of the plan being developed, the size of the jurisdiction, scale of the study area, and the process by which projects will ultimately be implemented. Larger jurisdictions like counties typically depend more upon quantitative data and more structured application of a specific set of criteria. Smaller jurisdictions tend to focus more on the clear identification of the network; and organization of projects was based mostly upon the ease or difficulty of implementation, rather than a ranking or scoring of the value of an individual link in the overall network.

One common thread recurring in the interviews was the need for more specific data regarding safety. In at least one case, the jurisdiction had to make a more subjective scoring of safety for an individual project based upon field observations or other components of the existing infrastructure. It was understood that crash data alone, even when available for the entire study area, cannot be used solely as the determining factor for safety because many pedestrian or bicycle crashes go unreported or are not reported in enough detail to assist in determining the relative safety of the facilities in place. In addition, human behavior plays a role whereby pedestrians and bicyclists will avoid intersections and other crossings they consider dangerous to cross. As a result, there would be little or no crash data at the locations being avoided despite the need to improve those areas.

Some jurisdictions have begun to place more emphasis on the use of demographic data or at a minimum, identification of key target areas like transit oriented development (TOD) sites or activity centers that have a greater opportunity to transfer more trips to non-motorized modes of travel.

## **A. Existing Planning Documents**

A number of County plans already include guidance on the provision of pedestrian and bicycle facilities. These plans include the Corridor Growth Management Plan, the General Development Plan, Small Area Plans, the Greenways Master Plan and additional sub-area plans. In an effort to understand previous plans and streamline future recommendations, the following plans were reviewed to capture any potential recommendations on pedestrian and bicycle facility planning, policy or procedure which may impact the 2013 PBMP.

### **1. Corridor Growth Management Plan (2012)**

The Corridor Growth Management Plan (CGMP) was completed in July 2012. The objective of the project was to develop concept-level transportation solutions for the nine regional and four connector corridors identified within the County. The Plan seeks to identify the relationship between land use patterns and Countywide mobility. The study provides “smart” transportation improvements which are meant to: decrease congestion, enhance travel choices and improve safety for vehicles, pedestrians and bicyclists without sacrificing the character of the study corridors. The Plan identifies a “toolbox” of recommendations for each corridor.

The CGMP is a standalone report intended to justify advancing each of the CGMP corridors to project planning and preliminary engineering. Furthermore, the CGMP supports coordination with other planning efforts including the General Development Plan, the 2013 Pedestrian and Bicycle Master Plan and the development of a Complete Streets policy. The goal is for the policies and objectives of each of these related documents to be integrated into a single Countywide Transportation Master Plan (anticipated completion in 2014). To paraphrase the CGMP, as part of the ultimate Countywide Transportation Functional Master Plan (TFMP), the Plan will need formal

adoption by the County Council. Once adopted it becomes a formal policy and the County can then revise the priority letter to the State Secretary of Transportation. This letter will serve as justification for revising the County's transportation priorities for the Baltimore Regional Transportation Board (BRTB) *Transportation Outlook 2035*, the long-range transportation plan for the Baltimore Region; and, if successfully advanced through Project Development, the State's Consolidated Transportation Program.

## **2. General Development Plan (2009)**

The General Development Plan, last updated in 2009, is the County's comprehensive planning document which must be reviewed "at intervals not to exceed" ten years by the County per County Code (Art. 18 §2-104). The Plan establishes a vision for the County which includes a number of subcomponents. Specific subcomponents which may impact pedestrian and bicycle facilities include the Transportation Plan and the Concurrency Management Plan.

The Transportation Plan includes seven key elements, among those being an "emphasis on improving safety for motorists, pedestrians and bicyclists", the "provision of alternative means of mobility through increased transit service" and most importantly for the 2013 PBMP, the "expansion of pedestrian and bicycle facilities." The Plan Proposals which will help accomplish the key elements include the "continued implementation of the Bicycle and Pedestrian Master Plan to provide an expanded bikeway and sidewalk network and greater overall support for biking and walking." According to the Plan, the Transportation Facilities Planning program funds design studies for pedestrian and bicycle facilities.

The Plan identifies the County Design Manual as the governing document for the design and redesign of County roadways. The Plan states that the manual "must be updated to reflect changes in design standards, compatibility with adjacent land use activities... **inclusion of pedestrian/bicycle use within the right-of-way** and, where appropriate, transit use." The Plan makes the following roadway design recommendations:

### ***Actions:***

- *Update and revise the County's Design Manual and appropriate sections of the Subdivision Regulations to incorporate context sensitive design requirements to promote design and redesign of the County's roadways to be more compatible with the surrounding land uses and the GDP Land Use Plan.*
- *Establish street design criteria to the extent permitted by State law to support alternative transportation modes to better meet user needs and minimize conflicts between competing modes.*

The following policies and actions are included to encourage the integration of bicycle and pedestrian facilities into roadway design as well as the subdivision and development review process:

*Policy 1: Continue implementation of the Bicycle and Pedestrian Master Plan to provide an expanded bikeway and sidewalk network and greater overall support for biking and walking.*

**Actions:**

- *Develop a program for prioritizing the maintenance of existing pedestrian facilities based on pedestrian use and connectivity as well as maintenance need, and secure funding sources for its implementation.*
- *Monitor progress in implementing the pedestrian-related goals and objectives of the Bicycle and Pedestrian Master Plan on an annual basis.*

*Policy 2: Ensure an interconnected community that provides multi-modal access to all neighborhoods.*

**Actions:**

- *Establish and/or maintain sidewalks, trails, context-sensitive street design, and community-oriented transit services.*
- *All new streets should connect, wherever possible, to existing streets as well as future potential developments.*
- *Provide safe corridors for pedestrians and bicycles throughout communities.*
- *Include transit shelters in neighborhoods and business developments along designated routes.*
- *Identify publicly owned properties in the vicinity of transit stations that could be used for joint public / private development.*

The Transportation Plan also recommends the preparation and adoption of a Transportation Functional Master Plan (TFMP) to address roadway, bicycle, pedestrian and public transportation needs including a financial plan for implementation over the next ten years. The TFMP is also to address changes to facility design including sidewalks, on-road biking and multipurpose trails. The TFMP should include a documented need for sidewalks, on-road bicycle space, and multipurpose trails

The Concurrency Management Plan guides the allocation of funds to the County Capital Improvement Program (CIP). It is also responsible for containing the information needed to properly plan for future needed public facilities and how those facilities will be funded. This structure impacts the way in which projects are planned, funded and constructed in the County.

### **3. Other Planning Documents**

The County has prepared a number of additional planning documents for targeted planning areas as a supplement to the General Development Plan to guide the County in

its land use and transportation planning decisions. Examples include the Small Area Plans completed for each of the small planning areas of the county. To date, Small Area Plans have been adopted by the County Council for each small planning area and are listed in the County Code (Article 18 §2-103) among documents which should be referenced when making development decisions.

The following additional planning documents are also referenced in Article 18 §2-103 of the County Code and should be considered in the development of policy regarding pedestrian and bicycle facilities:

- Anne Arundel County 2013 Land Preservation, Park, and Recreation Plan
- Greenways Master Plan
- Odenton Town Center Master Plan
- Parole Growth Management Plan
- Glen Burnie Small Area Plan / Town Center Plan

Each of these plans addresses pedestrian and bicycle facilities to a varying degree. The Odenton Town Center Master Plan, completed in 2009, is an example of a supplementary plan with an extensive section devoted to specific design standards for streetscapes, parking, landscaping, and site design.

## **B. Policy Recommendations**

While the plans reviewed discuss broader tactics and strategies for the provision of pedestrian and bicycle facilities throughout Anne Arundel County, policy documents dictate the detailed implementation of these facilities. The County's main policy documents were reviewed in order to identify opportunities to update these documents to ensure that pedestrian and bicycle facilities are considered throughout all stages of facility planning in the County. The policy documents reviewed include:

- Anne Arundel County Design Manual
- Anne Arundel County Code (Subdivision and Development Regulations; Zoning)
- Anne Arundel County Landscape Manual

These policy recommendations will be included as part of the 2013 PBMP, but additional coordination between County departments will be required to implement changes to each individual document.

The American Association of State Highway and Transportation Officials (AASHTO) provides guidance on the design of roadways, including specific guidance for the design and construction of pedestrian and bicycle facilities through a series of manuals. These manuals include:

- *AASHTO A Policy on Geometric Design of Highways and Streets 6th Edition, 2011.*
- *AASHTO Guide for the Development of Bicycle Facilities 4th Edition, 2012.*
- *AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities, 1<sup>st</sup> Edition, 2004.*



As a general recommendation for all County policy documents, minimum AASHTO standards should be implemented. A summary of AASHTO recommendations for pedestrian and bicycle facility design is located in **Appendix Q**.

**Appendix Q** also includes summaries of the *2011 Maryland Manual on Uniform Traffic Control Devices* (MdMUTCD) as well as the *Maryland State Highway Administration (SHA) Pedestrian and Bicycle Facility Guidelines*. These documents also provide recommended facility standards that should be considered when implementing any changes to County policy documents. A brief summary of the National Association of City Transportation Officials (NACTO) *Urban Bikeway Design Guide, 2012*, is also included in **Appendix Q**. This guide may be more relevant for the most urbanized portions of the County such as Glen Burnie and Parole.

## 1. Anne Arundel County Design Manual

As identified in the General Development Plan, and supported by Article 13 §2-202 of the County Code, the County Design Manual is the governing document for the design and redesign of County roadways. The County Design Manual was last updated in July 2006. The Design Manual also includes the Standard Details for Construction.

### Design Manual Summary

Chapter III of the County Design Manual includes standards for County roads and streets. Pedestrian and bicycle facilities are included under this broad heading. The Design Manual states that the minimum sidewalk width “shall be 4 feet” and that “sidewalks shall be five (5) feet wide if constructed contiguous to the curb.” The Design Manual continues to state that in areas with high projected pedestrian volumes sidewalk width should be “made sufficiently wide to accommodate anticipated pedestrian demand.” The Department of Public Works may review and approve sidewalk width for such areas. The Manual also states that all intersections should have appropriate facilities for handicap access, meeting Americans with Disabilities Act (ADA) Standards.

The corresponding Standard Details identify areas “normally requiring sidewalk”. Section VI of the Standard Details includes Paving. Typical sections are required for the main roadway functional classifications (principal arterial, minor arterial, collector, local), with urban and rural options for several. The following typical sections include allocations for sidewalk:

- Principal Arterial (Urban) – Minimum 4-foot concrete sidewalk “as required” with buffer (Detail P-1)
- Minor Arterial (Urban) – Minimum 4-foot concrete sidewalk “as required” with buffer (Detail P-2)
- Collector (Urban) – Minimum 4-foot concrete sidewalk with buffer (Detail P-4)
- Local Street & Cul de Sac (Urban) – Minimum 4-foot concrete sidewalk with buffer (Detail P-6)

- Stopping Lane for Public Transportation (Detail P-13) – 6-foot concrete sidewalk from face of curb.

Section VII of the Standard Details includes Roadway and Site Improvements. Typical sections are provided for Commercial Sidewalk (I-14) and Residential Sidewalk (I-15). Each of these drawings was last updated in 1988. Per the Manual text, the sections identify a minimum 4-foot wide sidewalk width which may vary. The details also specify that all unpaved areas within County right-of-way should contain a grass buffer. A minimum or standard width for this buffer is not specified. Five options for sidewalk ramps are also provided (Details I-18 through I-22).

Bicycle facilities are also discussed in Chapter III of the Design Manual. The Design Manual indicates that “bikeways shall be constructed where directed by Department of Planning and Code Enforcement (PACE) [now known as the Office of Planning and Zoning]” and that the designation of bikeways within the roadway is the responsibility of the Director of Public Works. Such locations warranting provisions for bicyclists include “residential areas, school and open space areas and short routes connecting residential and employment centers.” This description reflects one of the goals of the 2013 PBMP which is to provide bicycle facilities so that bicycling is an accepted and functional transportation alternative for short home-based work and home-based social and recreational trips.

Potential locations for bikeways include within the roadway pavement, separated from the roadway but within the street right-of-way or within their own right-of-way. Streets which will not normally have dedicated bicycle facilities include cul-de-sac streets and local streets “because of the low traffic volumes and speeds”. The Manual states that “as a guide to developers and design professionals, such bikeways will not normally be permitted within the roadway when the design speed exceeds 40 mph.” The Design Manual states that “bikeways shall conform to typical sections as shown in the Standard Details,” however specific reference to bicycle facilities is not located in the Paving or Roadway and Site Improvement sections of the Standard Details.

It is the current operating practice of the Department of Public Works in cooperation with the Office of Planning and Zoning to determine the need for sidewalk based on several requirements. Sidewalk should be provided unless the following requirements are met:

1. The projected Average Daily Traffic (ADT) on the roadway for a 25-year time frame is less than 400, AND
2. The average lot size is greater than 30,000 SF, AND
3. There are no pedestrian generators (schools, commercial areas, parks, transit, etc.) within 1 ½ miles of any entrance to the development.

### **Design Manual Recommendations**

- **Revise to recognize that the United States Department of Justice (USDOJ) enforces the ADA.** As part of that responsibility, USDOJ requires the minimum sidewalk width to be 3 feet with passing areas 5 feet by 5 feet spaced no further apart than 200 feet along pedestrian access routes.
- **Adopt a set of design guidelines for pedestrian and bicycle facilities for inclusion in the Design Manual.**

The current configuration of the Design Manual includes references to pedestrian and bicycle facilities as a secondary consideration, giving the most attention to vehicular facilities. Specifically, the wide array of facility types with specific criteria such as sidewalks, curb ramps with detectable warning surfaces (DWS), shared-use path, shared-use roadway, and on-road bicycle lanes need to definitely be provided in a separate chapter.

- **The Design Manual should reference the USDOJ adopted 2010 Standards for Accessible Design (2010 Standards) and the U.S. Access Board’s (Access Board) Draft Public Rights-of-Way Accessibility Guidelines 2013 (PROWAG) for providing compliant pedestrian facilities for the disabled.**
- **The Design Manual should reference the AASHTO *Guide for the Planning, Design and Operation of Pedestrian Facilities* (2004) and the *Guide for the Planning, Design and Operation of Bicycle Facilities* (2012) as additional references for designers and developers.**

These *Guides* are specific to pedestrian and bicycle facilities and can offer a wider array of design options and considerations than can effectively be conveyed in the Design Manual. The Design Manual should be updated as future versions of the *Guides* are released.

AASHTO anticipates an update to the *Guide for the Planning, Design and Operation of Pedestrian Facilities* will be released in 2014.

- **The Design Manual should reference Part 9 “Traffic Control for Bicycle Facilities” of the *Maryland Manual on Uniform Traffic Control Devices (MdMUTCD)* (2011) for specifications on bicycle facility treatments including pavement markings and signage. Appendix Q includes a brief summary of MdMUTCD contents.**
- **The Design Manual should reference the *Maryland State Highway Administration (SHA) Pedestrian and Bicycle Design Guidelines*. This document is referenced in the MdMUTCD as a supplementary guide for the design of pedestrian and bicycle facilities.**

- **Require a minimum clear width sidewalk of 5-feet for all County sidewalks.**

At a minimum, update the Design Manual and Standard Details to reflect the need for passing areas no further apart than 200 feet for sidewalks less than 5-feet wide but at least 3-feet wide, per USDOJ 2010 Standards. The width of 5 feet is required for two-way operations of wheelchairs, walkers and crutches.

- **The Design Manual should be amended to include a cross-reference to Chapter V – Storm Drains regarding the installation of storm inlet grates which are bicycle safe on all paving and rehabilitation and new construction projects and not located in pedestrian crosswalks.**

Some storm inlet grates can be a hazard for pedestrians and bicyclists if the grate openings are parallel to the direction of travel. Examples of bicycle safe drainage grates from the *Baltimore City Bicycle Facility Design Guide* are located in **Appendix R**. The County's Standard Details include a bicycle friendly grate option (Detail D-31), but the County may also wish to consider the inclusion of new grate types. The Standard Details should be amended to specifically note which grates are bicycle-friendly.

- **The Standard Details for pedestrian and bicycle facilities should be referenced in the Design Manual for ease of reference.**
- **The Standard Details for roadway typical sections should be updated to reflect the inclusion of different pedestrian and bicycle facility types (e.g. shared-use roadway, on-road bicycle lane, and shared-use path).**

Right-of-way requirements vary by facility type and should be considered.

- **Amend the Design Manual to include the Pedestrian and Bicycle Coordinator as a reviewer of pedestrian and bicycle facility design in cooperation with the Director of Public Works.**
- **The Design Manual should be updated to refer to Complete Streets Policy and Design Criteria for guidance designing roadway improvements to be safe efficient routes for travel by all modes.**
- **The Design Manual should be updated to refer to the revised Adequate Public Facilities portion of the Code (Article 17 §5-401) to reflect Complete Streets requirements.**

## 2. **Anne Arundel County Code**

The Anne Arundel County Code includes the legal framework for how development will occur throughout the County. The two main sections which specifically influence pedestrian and bicycle facilities are the Subdivision and Development Regulations (Article 17) and Zoning (Article 18). The Subdivision and Development Regulations indicate how individual parcels are developed, whereas Zoning governs the use of land within the County. The policies of the Code will ultimately influence how the policies of the Design Manual are carried out by planners, engineers and developers. The most recent major update to the Code was made in 2005.

### **Subdivision and Development Regulations (Article 17)**

Article 17, the Subdivision and Development Regulations of the Code, outlines the process by which land is subdivided and developed in the County. It discusses the basic requirements for all subdivisions along with the required steps in this process which include the initial sketch plan application, public notice, final plan application and review processes.

### **Subdivision and Development Regulation Recommendations**

- **Consolidate the pedestrian and bicycle mobility discussion with the County's goal to provide ADA compliant facilities which promote walking and bicycling as viable transportation alternatives.**
- **Update the General Provisions (Article 17 §2-102) to include a provision for the consideration of all modes of travel to include accessible pedestrian and bicycle facilities as viable transportation alternatives.**

Item (3) of this Section discusses the need for the proper arrangements of roads to “provide for the most beneficial relationship between the use of land, buildings, traffic, and pedestrian movements.” The addition of language regarding the provision of accessible pedestrian and bicycle facilities should be considered throughout the Code in instances where current language includes mention of pedestrian facilities only.

- **Update the Site Development Plan outlined in Article 17 §4-202 to include a more robust description of pedestrian and bicycle connectivity, including at the preliminary plan stage.**

The existing version includes pedestrian mobility only to the extent of considering ADA accessibility within the site development plan, not the preliminary plan. A change in this section of the Code is an opportunity for the Office of Planning and Zoning to require additional information on how the developer intends to connect the site into the pedestrian and bicycle network of an area.

- **Incorporate pedestrian and bicycle facilities into Title 5 which discusses the need to include Adequate Public Facilities in accordance with “General Development Plan growth objectives” to ensure connection to the existing pedestrian and bicycle system and to connect the planned facilities in the appropriate width and with the proper grades and cross slopes.**

The *2009 General Development Plan* includes the continued implementation of a pedestrian and bicycle network as a Plan policy. This recommendation may include changes to Article 17 §5-101, §5-102, §5-201 and §5-401.

**Article 17 Subtitle 4 which discusses “Adequate Road Facilities” should be updated to include specific reference to pedestrian and bicycle facilities.** By doing so, this policy will reflect Complete Streets requirements for a comprehensive transportation system.

- **Include the establishment of a “Pedestrian/Bicycle Fee in Lieu of Construction” type program within Title 5 for use in implementing pedestrian and bicycle facilities. Funds generated from this program should be placed into the Impact Fee District fund where the pedestrian or bicycle project should occur.**
- **Provide a strong, clear discussion of the need to provide right-of-way and construction of Complete Streets with accessible pedestrian and bicycle facilities compliant with the Pedestrian and Bicycle Master Plan in Title 6 and Article 17 §6-103 through a site development plan.**

Article 17 §6-103 discusses road design within a subdivision or site development. The need to provide pedestrian facilities is a secondary function of the need for a transit-ready infrastructure in mixed use and high density residential developments. Furthermore, the need to provide public right-of-way to accommodate the pedestrian and bicycle facilities outlined in the Pedestrian and Bicycle Master Plan is hidden within the discussion of public roads.

- **Provide a consistent approach in how pedestrian and bicycle facilities are cited in Title 7 of Article 17 to enhance the ease of use of the document.**

There is inconsistent reference to the 2013 PBMP as an overarching guide to be considered in all developments throughout the County. The

following Subtitles include mention of pedestrian and bicycle facilities which should be revised to provide a consistent reference to the 2013 PBMP:

- Subtitle 2 – Commercial and Industrial Development
- Subtitle 6 – Mixed Use Development Under the Optional Method of Development
- Subtitle 8 – Odenton Growth Management Area District
- Subtitle 9 – Parole Town Center Growth Management Area
- Subtitle 10 – Planned Unit Developments

The language of Subtitle 2 for Commercial and Industrial Development is a general, yet comprehensive description of the County's goal of pedestrian and bicycle connectivity that could be applied to the other types of development which are not currently covered in their own Subtitle:

*“Convenient functional linkages shall be achieved in commercial and industrial development by providing vehicular, bicycle, and pedestrian connections to promote the circulation and flow of vehicles, bicycles, and pedestrians between the development and existing uses.”*  
(Article 17 §7-201.(b))

The notion of connections “between the development and existing uses” is akin to the 2013 PBMP concept of providing connections within a two-mile trip radius which connect major pedestrian and bicycle trip generators and attractors such as schools, shopping centers and transit to residential areas.

- **Amend Article 17 §11-209 to explicitly state that pedestrian and bicycle facilities fall within the eligible capital improvements which can be paid for through the use of impact fees:**

**“All funds collected from development impact fees shall be used solely for capital improvements for expansion of the capacity of public schools, roads, and public safety facilities and not for replacement, maintenance, or operations. Expansion of the capacity of a road includes extensions, widening, intersection improvements, upgrading signalization, improving pavement conditions, and all other road and intersection capacity enhancement including pedestrian and bicycle improvements if the roadway is located on or adjacent to a designated route within the PBMP.”**

### **Zoning (Article 18)**

The Zoning component of the Anne Arundel County Code seeks to divide the County into zoning districts “of such character, number, shape, and area as are best suited to effect” the overarching policies to provide for the wellbeing of the County’s future growth and development (described in full in Article 18 §2-102). The Code cites the various planning documents previously cited in this memorandum, including the *General Development Plan*, the Small Area Plans, and the *Pedestrian and Bicycle Master Plan* as guides for the development of County zoning.

In its current form, the Zoning portion of the County Code includes the permitted and conditional uses for each district, basic bulk regulations, and form requirements. While the requirement to provide pedestrian and bicycle facilities may be more of a priority for certain zoning districts, that need is ultimately reflected in site development regulations, not the Zoning Code. The Zoning Code outlines what **may** be constructed in a district, whereas the Subdivision and Development Regulations dictate what **must** be provided within a district’s developments.

### **Zoning Recommendations**

- **Amend Title 3 as follows to include a requirement for bicycle parking including the number of required bicycle parking spaces.** (Current bicycle parking regulations are found only within the Landscape Manual.)

#### **§ 18-3 Location: Bicycle Parking Spaces**

(a) Bicycle parking shall be located on the same lot as the use or building for which it is provided.

(b) Bicycle parking spaces shall be located in order to provide convenient access to main entrances or well-used areas.

(c) A bicycle parking space may be located in any yard.

(d) A maximum of 50% of the required bicycle parking space or 15 spaces whichever is greater, may be located in a landscaped area.

#### **§ 18-3 Specific requirements for bicycle parking.**

Each bicycle parking space must:

(a) allow both the bicycle frame and the wheels to be locked using a standard U-lock;



- (b) be designed so as not to cause damage to the bicycle;
- (c) facilitate easy locking without interference from or with adjacent bicycles;
- (d) be at least as conveniently located as the most convenient vehicle parking space not reserved for persons with disabilities;
- (e) be sited in a well-lit, highly visible, and active area that is accessible to all property users;
- (f) be positioned so as to minimize interference with pedestrian movements;
- (g) be clearly labeled as reserved for bicycle parking; and
- (h) include racks or lockers that are:
  - (1) anchored so that they cannot be easily removed;
  - (2) solidly constructed;
  - (3) resistant to rust and corrosion; and
  - (4) resistant to hammers and saws
- (i) Bicycle parking spaces must be at least four feet by six feet for an outdoor space and fifteen square feet for an enclosed space.

**§ 18-3 Required number of bicycle parking spaces.**

(a) In general.

1 bicycle parking space must be provided for:

- (1) every 10 vehicle parking spaces required by this title, for the first 500 vehicle parking spaces; and
- (2) every 20 vehicle parking spaces after the first 500 vehicle parking spaces required by this title.

(b) Vehicle parking space offset.

The number of vehicle parking spaces required by this title is reduced by 1 for every 8, or fraction of 8, bicycle parking spaces provided as required by this section.

A variance may authorize a reduction in the number of bicycle parking spaces that are required by the applicable regulations.

### 3. Landscape Manual

According to Article 17 §6-201, the Anne Arundel County Landscape Manual is to be prepared by the Planning and Zoning Officer and shall include “regulations governing the landscaping, screening, and buffering of all development.” The Landscape Manual was last amended in 2010, largely to reflect the updated Subdivision, Development and Zoning articles of the County Code in 2005. The Landscape Manual includes standards which dictate how landscape elements “should be used for land development in an organized and harmonious fashion that will enhance the physical environment of Anne Arundel County.” While the policies previously discussed cover where development may occur and the general elements that should be included, the Landscape Manual determines the execution of many of the elements previously selected. It is the successful execution of landscape elements that creates a welcoming environment for pedestrian and bicycle facilities that users will feel comfortable selecting as viable transportation alternatives.

#### Landscape Manual Recommendations

- **Include bicycle parking requirements for additional zoning districts.**

Current bicycle parking standards are found only within Section A, Street Trees & Streetscapes (sub-section, Urban Streetscape Standards). Not only should bicycle parking be located “within easy access from the street,” but also in highly visible locations convenient to building entrances.

- **Amend Section Q, Recreational Facilities, to include the provision of bicycle parking.**
- **Include a list of approved and/or recommended bicycle parking types in the Appendices.**

### 4. Complete Streets Policy

The concept and implementation of Complete Streets is organized on a national level by the National Complete Streets Coalition, a program within the Smart Growth America organization. The National Complete Streets Coalition defines Complete Streets as:

*“...streets for everyone. They are designed and operated to enable safe access for all users. Pedestrians, bicyclists, motorists, and public transportation users of all ages and abilities are able to safely move along and across a complete street. 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.”*

The Maryland State Highway Administration (SHA) issued a Complete Streets policy in 2011 with the goal of creating “a comprehensive multi-modal network by ensuring connectivity for vehicles, bicycling, walking, transit, and freight trips throughout Maryland’s transportation system.” SHA intends to release a separate “Implementation Guide” for Complete Streets policies in the near future. Other nearby local governments that have adopted Complete Streets policies include Baltimore City and Prince George’s County, in Maryland; and Arlington County, Virginia. The Prince George’s County Approved Countywide Master Plan of Transportation includes the following Complete Streets Policies on its Bikeways and Trails Map:

*Policy 1: Provide standard sidewalks along both sides of all new road construction within the Developed and Developing Tiers.*

*Policy 2: All road frontage improvements and road capital improvement projects within the Developed and Developing Tiers shall be designed to accommodate all modes of transportation. Continuous sidewalks and on-road bicycle facilities should be included to the extent feasible and practical.*

*Policy 3: Small area plans within the Developed and Developing Tiers should identify sidewalk retrofit opportunities in order to provide safe routes to school, pedestrian access to mass transit, and more walkable communities.*

*Policy 4: Develop bicycle-friendly roadways in conformance with the latest standards and guidelines, including the 1999 AASHTO Guide for the Development of Bicycle Facilities.\**

*Policy 5: Evaluate new development proposals in the Developed and Developing Tiers for conformance with the complete streets principles.*

*Policy 6: Work with the State Highway Administration and the Prince George’s County Department of Public Works and Transportation to develop a complete streets policy to better accommodate the needs of all users within the right-of-way.*

\*Since the completion of Prince George’s County’s Complete Streets Policies, AASHTO released the updated *Guide for the Development of Bicycle Facilities 4<sup>th</sup> Edition*, 2012.

### **Complete Streets Policy Recommendation**

- **Develop and adopt a Complete Streets Policy for Anne Arundel County to guide designers, developers and government officials in the**

**implementation of roadways which include comfortable facilities for motorists, pedestrians, bicyclists and transit vehicles.**

The creation of a Complete Streets network in the County will encourage the use of walking and bicycling as viable transportation alternatives.

- **Integrate the Complete Streets Policy into the County Code, Subdivision and Development Regulations, Design Manual and Landscape Manual where appropriate to ensure that roadway projects and developments completed in the County provide the equitable inclusion of facilities for all modes at all stages of the planning, design and construction processes.**

## **C. Staffing & Procedural Recommendations**

### **1. Americans with Disabilities Act (ADA) Requirements**

Anne Arundel County is required to complete the steps necessary to meet the following Title II ADA requirements:

- ADA requires state and local jurisdictions with 50 or more employees to conduct a self-evaluation for compliance with ADA requirements and guidelines for all county facilities, services and programs. USDOJ considers sidewalks to be a program provided by state and local jurisdictions.
- ADA requires a transition plan be developed to:
  - Prioritize needed ADA compliant improvements
  - Fund these needed improvements
  - Implement the needed improvements

### **2. Pedestrian/Bicycle Coordinator**

Even with the recommended changes to the County Design Manual, Code and Subdivision and Development Regulations and the addition of a Complete Streets Policy, it will be challenging to coordinate the planning and implementation of pedestrian and bicycle projects without dedicated staff support.

#### **Pedestrian/Bicycle Coordinator Recommendations**

- **Create a Pedestrian and Bicycle Coordinator permanent staff position within the Office of Planning and Zoning (OPZ) or the Department of Public Works (DPW).** The overarching responsibility of the Pedestrian and Bicycle Coordinator should be to oversee the planning, prioritization, coordination and implementation of pedestrian and bicycle projects throughout the County.

Auxiliary duties of this position may include:

- **Oversee County Marketing, Safety and Educational Outreach for pedestrian and bicycle travel.**

These initiatives will be covered in full detail in the 2013 PBMP. An example generated from one of the Public Listening Sessions is to change the driver education programs to include information regarding the interactions between vehicles, pedestrians and bicycles. This could improve conditions for bicyclists and pedestrians, as drivers learn to expect them and learn to accommodate them on shared facilities

- **Participate in the Subdivision and Design Review process to ensure that pedestrian and bicycle facilities are included in new subdivisions and other County projects.**
- **Coordinate with County Maintenance staff to ensure that new pedestrian and bicycle facilities are incorporated into the County's maintenance strategy.**

The Pedestrian and Bicycle Coordinator should conduct periodic reviews of facilities throughout the County to determine if current maintenance procedures are effective or if additional measures should be implemented. The Coordinator should monitor sidewalk condition, vegetation, pavement condition of bicycle facilities, including wear of pavement markings and the function of pedestrian signals. This responsibility also includes adding new bicycle facilities to the street sweeping list maintained by the County.

- **Develop and Maintain a Pedestrian and Bicycle Crash Database.**

When a crash occurs, the Coordinator shall evaluate and review the details of the crash to determine the cause of the crash (i.e. unsafe facility, distracted driver, etc.).

- **Pursue funding opportunities for pedestrian and bicycle projects through coordination and grant writing with County, Regional, State and Federal agencies.**
- **Develop performance measures to track the success and/or impact of new pedestrian and bicycle projects.**
- **Conduct an annual review of the Pedestrian and Bicycle Master Plan in cooperation with the Anne Arundel County Public Schools**

**transportation planners to improve linkages between existing and planned development and schools.**

- **Manage the record of pedestrian and bicycle projects as they are implemented.**

This includes projects completed as part of a 2013 PBMP recommendation as well as projects identified in other County planning documents.

### **3. Facility Maintenance**

Facility Maintenance is managed through the Bureau of Highways as well as the County Traffic Engineering Division. The primary method of initiating a maintenance repair is through citizen reporting. Citizens can make reports of maintenance needs through their appropriate Road District or the Traffic Engineering Division's telephone line, depending on the type of facility in need of repair. The Bureau of Highways is responsible for surface repairs, storm drain repair, litter and debris removal; as well as snow and ice control on County roadways. The Traffic Engineering Division manages maintenance of pavement markings.

According to Article 13 §2-205 of the County Code, routine maintenance and repair of sidewalks is the responsibility of the abutting property owner unless the County has damaged the sidewalk in some manner.

Currently, the Department of Public Works (DPW) maintains shared-use paths which are adjacent to roadways, within the transportation right of way (e.g. Bay Dale Drive Bike Path). In order for the other shared-use facilities in the County to be utilized for transportation purposes, as opposed to merely recreational purposes, policy changes in addition to the recommendations below will be necessary. Future research and coordination should be completed between the Office of Planning and Zoning (OPZ), the Department of Public Works (DPW) and the Department of Recreation and Parks to facilitate policy changes to address the following issues:

- Year-round maintenance of shared-use paths and recreational trails (including snow removal).
- Determining sources of funding for maintenance including staffing requirements and equipment acquisition. Numerous reports and studies have been completed on the average costs per mile for the maintenance of shared-use facilities. The range of average costs per mile is anywhere from \$2,000 to \$10,000. The range of costs is due to surface type, seasonal vs. year-round operation, length of facility, etc. Information is also available on the average annual maintenance hours per mile for a shared-use facility. The range for average annual maintenance hours is approximately 150 to 250 hours per mile.
- Establishing hours of operation which reflect the use of shared-use facilities for daily commutes. This may require consideration for lighting along some facilities.

- Determining a maintenance protocol for shared-use facilities constructed by home-owners associations (HOAs), developers and other entities which allows for use of the facilities by the general public and connections to County facilities.

### Facility Maintenance Recommendations

- **Any roadway with a bicycle facility (shared-use roadway, shoulder or bicycle lane) should be included on the County's Street Sweeping list.**

The street sweeping schedule should be evaluated by the Pedestrian and Bicycle Coordinator to ensure that the current sweeping cycle meets the needs of the facility and its users.

- **Streamline facility maintenance requests from citizens through an online form available on the County website.**

The form can allow citizens to submit requests and indicate what type of facility is in need of repair. The Pedestrian and Bicycle Coordinator should receive copies of requests that pertain to pedestrian and bicycle facilities so they can follow up with the appropriate County Division/Department to ensure the requests are investigated and completed if determined necessary. The current "Contact DPW" form should be improved to allow citizens to specify if a comment is related to maintenance or a specific facility or location.

- **The Pedestrian and Bicycle Coordinator should complete field reviews of pedestrian and bicycle facilities in high use areas and in areas where issues have been reported by citizens.**

The review should identify, among other items, the following maintenance issues and hazards and coordinate repairs as needed:

- Horizontal sidewalk gaps or vertical elevation differences ½ inch or greater
  - Vegetation encroachment on sidewalks
  - Worn pavement markings such as crosswalks and bicycle lanes
  - Drainage grates which are not bicycle safe
  - Drainage problems resulting in standing water at intersections, curb ramps and crosswalks
  - Vertical or horizontal sign/pole protrusion into the clear width sidewalk
- **The Pedestrian and Bicycle Coordinator should refer maintenance issues identified outside of County control to the appropriate jurisdiction contact person (e.g. SHA).**

- **Develop a Maintenance Process which addresses the issues identified above (e.g. funding, staffing, etc.).**



## VII. Non-Infrastructure Improvements

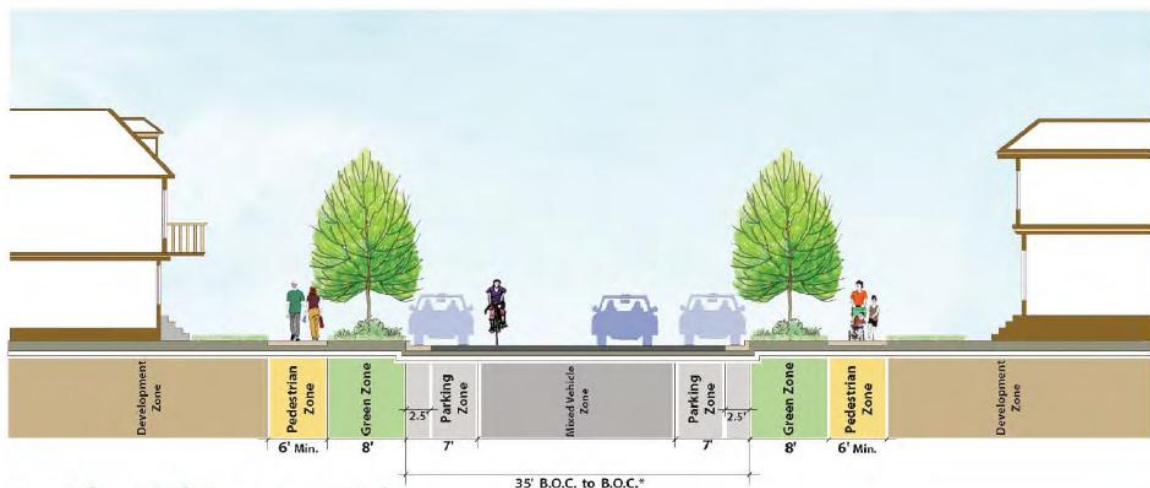
### A. Education and Safety Programs

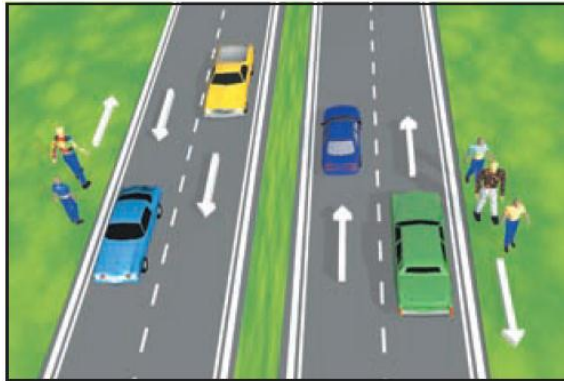
#### 1. Driver's Education Program

The education of new drivers on the basic “rules of the road” is also an opportunity to reinforce the concept of “shared roadway” and the many different users drivers may encounter when operating a motor vehicle. The County should coordinate with the Maryland Department of Transportation (MDOT) Motor Vehicle Administration (MVA) as well as all Certified Driver Education Schools in the county, to ensure that awareness of pedestrians and bicycles and appropriate driver behavior is promoted during driver education.

In 2011, Maryland updated the Driver's Manual to include additional information regarding sharing the road with bicycles. The current edition of the Maryland Driver's Manual includes pedestrians and bicycles in two sections: Highway Pavement Markings (Section IV.C.3) and Sharing the Road (Section VII.A and Section VII.F). As transportation alternatives such as walking and bicycling start to assume more of the modal share in transportation, a more robust description of the many users of the roadway earlier in the Manual in the Basic Driving section may help to set the tone for awareness of pedestrians and bicycles throughout the Manual. Graphics such as the ones in **Figure 11** and **Figure 12** may help new drivers visualize where other users may be present in relation to a motor vehicle on the roadway.

**Figure 11: Charlotte Urban Street Design Guidelines Example**



**Figure 12: California Driver Handbook Example**

## 2. Safe Routes to School

Safe Routes to School (SRTS) is a national program supported by the Federal Highway Administration (FHWA) that involves cooperation between parents, schools, community leaders, local, state and federal government in order to achieve the following goals:

- To enable and encourage children, including those with disabilities, to walk and bicycle to school;
- To make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age; and
- To facilitate the planning, development, and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity of schools.

In Maryland, SRTS grants are managed through the Maryland State Highway Administration. SRTS funds can be used for infrastructure (e.g. sidewalks, crosswalks, bicycle racks, ADA ramps) as well as non-infrastructure education and encouragement programming. According to a 2011 Maryland Department of Transportation report entitled “Maryland Statewide Student Travel Policy Survey,” Anne Arundel County was among 14 counties that have received SRTS funding since the program began in Maryland in 2007. Anne Arundel County schools reported participation in International Walk to School Day as well as promotion of pedestrian safety on Earth Day. In 2012, the following Anne Arundel County Schools participated in walking and/or biking to school events according to the national SRTS website:

- Belvedere Elementary School
- Germantown Elementary School
- West Annapolis Elementary School

Education is a major component of SRTS to ensure that all parents and students are aware of safe walking and bicycling practices. In 2003, the Rockville Department of

Recreation and Parks, in cooperation with the Maryland State Highway Administration's Highway Safety Office and the Maryland Pedestrian and Bicycle Safety Education Program, developed a comprehensive set of lessons on safe walking and bicycling for grades K through 5. The lessons are available through the Safe Routes to School website. The County should coordinate with local public and private schools to ensure that they are taking advantage of this type of safety and educational resource.

The 2011 Annapolis Bicycle Master Plan recommends that Anne Arundel County Public Schools should adopt the National Highway Traffic Safety Administration (NHTSA) Pedestrian Safety Curriculum as part of the school physical education annual curriculum.

### **3. Street Smart Program**

The Street Smart program is an annual campaign which stresses public education, awareness and behavioral change to respond to the challenges of pedestrian and bicyclist safety. The program started in the Washington, DC area and has since expanded to the Baltimore metropolitan area.

In the Baltimore region, the StreetSmart program is coordinated by the Baltimore Metropolitan Council (BMC) in partnership with the Maryland Highway Safety Office. In 2012, StreetSmart began targeting Anne Arundel County along with Baltimore City and County. Outreach efforts included billboards and distribution of brochures and blinking safety lights by "street teams" as well as coordination with Anne Arundel County and Annapolis police to encourage enforcement activities in areas with high pedestrian crash volumes. StreetSmart also includes radio and television spots in the Baltimore media market and random before and after surveys conducted in the targeted counties. StreetSmart is intended to compliment, not replace, local education and enforcement efforts. More information on the Baltimore region StreetSmart program can be found at <http://www.bmorestreetsmart.com>.

The DC Street Smart website (<http://bestreetsmart.net/resources.php>) offers a number of resources for pedestrian and bicycle safety that are appropriate for a wide range of users. These resources include safety brochures, cards, videos and other outreach media such as posters for bus stops. DC Street Smart also interfaces with the public through the social media site, Twitter.

The County should continue to coordinate with the Baltimore StreetSmart program to see if there are additional partnership opportunities for pedestrian and bicycle safety awareness events, education and outreach.



## B. Crash Data

One of the recommendations identified through the Policy, Administrative and Regulatory Changes Chapter of the 2013 PBMP involved the creation of a permanent staff position for a Pedestrian and Bicycle Coordinator. Within the recommended duties of this position is the development and maintenance of a Pedestrian and Bicycle Crash Database.

The first step in this process involves coordination with the Anne Arundel County Police Department and the Maryland State Police to gain access to all crash reports where a pedestrian or bicycle is involved. As of April 2013, the Anne Arundel County Police Department was updating its crash reporting form to include more detail on all crashes which occur within the County's jurisdiction.

Once data is available, the Pedestrian and Bicycle Coordinator should develop a database through which the crash records can be managed and analyzed. This could be accomplished through a variety of methods:

- **GIS Geodatabase** – A customized GIS geodatabase could be used to manage crash locations by their geographic coordinates. The geodatabase should include attribute fields for all relevant crash information (per the crash report forms).
- **Crash Data Software** – The Federal Highway Administration (FHWA) has developed a specialized Pedestrian and Bicycle Crash Analysis Tool (PBCAT) which is a software application designed to assist State and local pedestrian and bicycle coordinators in addressing pedestrian and bicycle crash problems. Through PBCAT, the Pedestrian and Bicycle Coordinator can develop a database based on “crash type” and then can complete analysis, produce reports, and select countermeasures to address problems.

Further information on PBCAT is available at:

[http://www.bicyclinginfo.org/facts/pbcats/techbrief\\_HRT-06-090\\_print.pdf](http://www.bicyclinginfo.org/facts/pbcats/techbrief_HRT-06-090_print.pdf)

**Figure 13: Screenshot of PBCAT Software**

### C. Grass Roots Efforts

Grass roots efforts have long been used to promote larger goals and objectives at a local level with nominal funding. These types of efforts typically employ the use of volunteers and/or advocacy groups that will help to spread the message or promote various events. The objective of employing these grass roots efforts in conjunction with other recommendations throughout this Master Plan is to build awareness and advocacy campaigns to promote and increase the walking and bicycling community throughout Anne Arundel County.

#### **Pedestrian and Bicycle Advisory Board**

The County should create a Pedestrian and Bicycle Advisory Board to ensure public input and progress on pedestrian and bicycle goals. A citizen's board that reports to the County Council would provide ongoing input to the development and implementation of pedestrian and bicycle facilities, policies, and standards in the County. Similar boards are used by local jurisdictions with involvement including developing policy and planning documents, setting priorities, and reviewing new plans and projects.

**Complete Streets Advisory Board**

As the County continues to develop and implement a Complete Streets policy, it may become beneficial to create a Complete Streets Advisory Board to ensure public input as Complete Streets elements are proposed and implemented. This citizen's board could be incorporated separately or in conjunction with the Pedestrian and Bicycle Advisory Board.

**Bicycling Clubs**

There are numerous bicycle clubs throughout the region, such as BikeAAA, that promote bicycling in groups and have various bicycle trips. Many of these can be found online as well as through coordinating with local bicycle shop owners that often serve as the "home base" for these clubs. Often the shop owners and bicycle clubs will promote bicycle safety, bicycle awareness and work to increase their visibility in the community.

Anne Arundel County can develop and promote, in coordination with these individuals, a campaign to promote bicycling. To begin this campaign, the County should hold a bicycle group oriented public workshop specific to the bicycle groups and shop owners to develop a total list of programs that the clubs would be interested in completing. Programs could range from bicycling safety workshops, organized rides for all levels of bicyclists, and in coordination with Department of Recreation and Parks, organized rides along various trails that promote the existing trail system throughout the different sections of the County.

**Bicycle Racks**

As no new shopping center would be placed without consideration of parking requirements, the same consideration should be given for bicycle parking in order to continue to promote the use of this as a viable mode of transportation. All potential destinations such as shopping centers, employment centers, and transit stations should consider bicycle parking in well-lit, highly visible locations with bicycle racks and /or lockers.

**Running /Walking Clubs**

Similar to the bicycle clubs, there are numerous walking and running groups throughout the County that also use running stores as their "home base." Anne Arundel County could also organize events with these clubs.

**Tourism**

In addition to working with the bicycling and running clubs, there are other groups and departments throughout Anne Arundel County and within the City of Annapolis that can work to promote bicycling and walking as a component of their tourist attractions. Using resources such as the Anne Arundel Economic Development Corporation to promote walking tours and bicycling tours throughout various regions to sightsee and/or complete historic tours would be one way to continue this promotion.

## VIII. Implementation

### A. Implementation Plan

The Office of Planning and Zoning should create an Implementation Plan with regular tracking and reporting on the implementation of all recommendations as they are executed according to the 2013 Pedestrian and Bicycle Master Plan (2013 PBMP). The creation of such a plan would promote accountability and would facilitate the orderly documentation of all Plan achievements.

Addressing the needs of pedestrians and bicyclists should be a regular part of the County's day-to-day operations. This Implementation Plan should ideally be managed by the Pedestrian and Bicycle Coordinator once the position is established. The Pedestrian and Bicycle Advisory Board should also be involved in the development and execution of the Implementation Plan.

All infrastructure improvements should be tracked according to the completion of pedestrian and bicycle facility projects. A specific component of this tracking could be the completion of pedestrian and bicycle counts at potential infrastructure improvement sites, major employment areas, schools, shopping areas and other attractors and destinations. By completing counts prior to implementation, a baseline would be established against which future pedestrian and bicycle count data could be compared. These counts would establish a quantitative measurement for pedestrian and bicycle use, which is a valuable component to measuring project success.

In addition, the Implementation Plan should track all changes to the County Design Manual, Subdivision and Development Regulations, Zoning, Landscape Manual and Maintenance Procedures which support walking and bicycling as viable transportation alternatives for the County. There should also be a record of all safety, educational and outreach programs.

### B. Project Safety Audits

The Prioritization Tiers and Evaluation Criteria Scores associated with each of the potential projects and opportunities identified in Chapter V are the first step towards selecting projects for implementation. For many of the potential projects and opportunities, additional planning studies and cost estimates will be required in order to secure funding for construction. Project Safety Audits are an opportunity to further examine the best candidates for future study and implementation.

Project Safety Audits are processes that involve gathering of data about the environmental conditions which affect walking and bicycling at a potential project site in order to identify appropriate countermeasures and solutions. A typical safety audit may consist of groups of five or more people (potentially including community members, government officials, law enforcement, engineers and planners) partaking in an immersive first-hand look at a potential

project site to determine factors which may help or hinder safe walking and bicycling. Elements to include in the data collection may include:

- Presence of bicycle lanes
- Presence of sidewalk
- Sidewalk width and condition
- Signs and pavement markings
- Street lighting
- Traffic volume
- Topography

Safety audits are recognized by a number of organizations as an important tool in providing pedestrian and bicycle facilities. The Federal Highway Administration (FHWA) conducts Road Safety Audits (RSA) which are formal safety examinations of a future roadway plan or project to be completed by a multi-disciplinary team. FHWA identifies Pedestrian Roadway Safety Audits as subsets of RSAs which should be conducted to improve and identify pedestrian safety problems. FHWA published a “Pedestrian Road Safety Audit Guidelines and Prompt Lists” document which comprehensively outlines a Pedestrian Road Safety Audit. A similar set of guidelines was released in May 2012 for Bicycle Road Safety Audits.

According to *Better Cities and Towns*, the walking audit was a top tool that the U.S. Environmental Protection Agency (EPA) chose in 2011 for technical assistance related to its “Building Blocks for Sustainable Communities” initiative. Walk audits are also utilized and promoted by the National Center for Safe Routes to School (SRTS) Program at the site, school, neighborhood and route scale. According to the SRTS website, results from walking and bicycling audits, combined with other observations and survey results, form the basis of the design of a Safe Routes to School program. Other organizations and programs which support the use of walk audits include AARP’s Create the Good Program, Pedestrian and Bicycle Information Center, and Walkscore.com.

The Baltimore Regional Transportation Board (BRTB) has approved funds in its 2014 Unified Planning Work Program (UPWP) to provide staff coordination and support for walkability workshops and/or Road Safety Audits to member jurisdictions. The BRTB will coordinate a walkability workshop in Harford County in September 2014 and is developing a workbook and sample materials to assist jurisdictions in conducting future walkability workshops or audits. The BRTB will draw on the expertise of its Bicycle and Pedestrian Advisory Group to assemble multi-disciplinary, multi-jurisdictional teams of regional professionals to assist jurisdictions in conducting Road Safety Audits or workshops according to their needs.

## **C. Coordination with Others**

### **1. Anne Arundel County Department of Health**

There is clearly a direct relationship between options of travel not involving automobiles and the health of the residents, employees and visitors within Anne Arundel County. The



Department of Health recently completed the Community Health Needs Assessment and Report (2012). This document contains the most current data.

The 2012 Community Health Needs Assessment (CHNA) Final Report can be found online at <http://www.aahealth.org/pdf/chna-final-report.pdf>. Of specific note would be pages 6, 21, 22, 26 for Demographics and Access to Health Care as travel alternatives like walking and bicycling have direct impact upon the health of persons residing in and working within the County, especially in terms of nutrition, physical well-being and weight.

This relationship is borne out again in the 2012 CHNA Secondary Data Profile which is found online at <http://www.aahealth.org/pdf/chna-secondary-data-profile.pdf>. Of particular note is page 45 for Health Behavior Statistics (Adult Obesity and Overweight).

The Department of Health's April 2013 Overweight and Obesity in Children and Adolescents in Anne Arundel County can be found online at: <http://www.aahealth.org/pdf/OverweightObesityChildren2013.pdf>. Where consideration of a higher instance of risk of chronic disease can be identified, these areas should be taken into account while evaluating the ranking of identified projects. This report offers a County map reflecting locations.

Continuing coordination between the Department of Health and the Office of Planning and Zoning will contribute towards achieving the goals of both departments in a complementary fashion.

## **2. Anne Arundel County Police Department**

The Anne Arundel County Police Department (AACOPD) is a project stakeholder and contributing member of the Project Management Team (PMT). Collaboration with the AACOPD should continue even after the master planning process concludes in order to implement pedestrian and bicycle safety programs including the creation of a Pedestrian and Bicycle Crash Database. Officers of the AACOPD should be educated on the assessment of pedestrian and bicycle crashes in order to accurately document the contributing factors to a crash, including any deficiencies in infrastructure. The AACOPD is in the process of updating its crash reporting form which will include more detailed information that may be of use for future planning efforts.

## **3. Baltimore County**

Anne Arundel County shares its northeast border with Baltimore County. The map of Countywide Pedestrian and Bicycle Projects (**Figure 5**) illustrates the main potential pedestrian and bicycle connection along Baltimore Annapolis Boulevard (MD 648), with the route ultimately connecting to the Gwynns Falls Trail in Baltimore City. Baltimore County approved its *Western County Pedestrian and Bicycle Access Plan* as an

amendment to the County Master Plan in 2012, which includes a recommendation for a bicycle lane along MD 648 north of the Anne Arundel County Line. Coordination between counties should occur to ensure successful implementation of plan elements in both counties.

#### **4. Baltimore Regional Transportation Board**

Anne Arundel County and the City of Annapolis are members of the Baltimore Regional Transportation Board (BRTB), the Metropolitan Planning Organization (MPO) for the Baltimore region. The BRTB approves expenditures of federal transportation funds in the region, coordinates long-range regional transportation planning, and administers federal planning funds and several grant programs. One key grant program administered at the MPO level is the federal Transportation Alternatives program, which provides 80% funding for bicycle and pedestrian projects along with several other uses.

Additionally, the BRTB employs a bicycle and pedestrian planner and coordinates regional bicycle and pedestrian activities through the Bicycle and Pedestrian Advisory Group. The BRTB disseminates information on bicycle and pedestrian topics and can provide technical support and advice on bicycle and pedestrian projects, including Pedestrian and/or Bicycle Road Safety Audits.

Anne Arundel County should continue to explore opportunities to coordinate with BRTB on project funding and planning activities.

#### **5. City of Annapolis**

The City of Annapolis is wholly contained within Anne Arundel County. As a regional destination for jobs and tourism, it is imperative to provide ample pedestrian and bicycle facilities to encourage travel to and from Annapolis through transportation alternatives. The Annapolis Bicycle Master Plan, completed in 2011, outlines the City's proposed bicycle network with implementation horizons of zero to two (0-2) and three to five (3-5) years. The City and County should coordinate throughout the implementation and construction process to take advantage of potential cost-savings through project partnerships.

Another opportunity for coordination with the City is through their Wayfinding and Signage Master Plan. The Plan is in the Council review phase as of April 2013 and includes recommendations for vehicles, pedestrians and bicyclists. The County should look for opportunities to continue wayfinding into the County, especially at gateway locations.

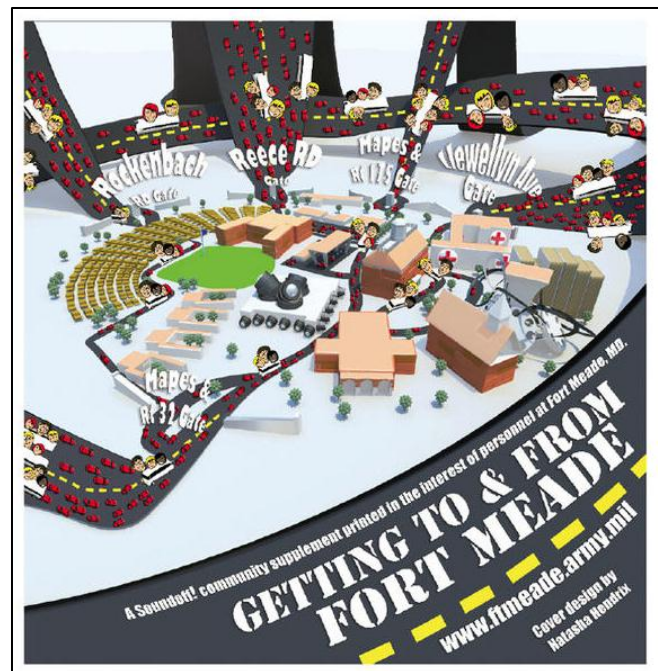
## 6. City of Baltimore

Anne Arundel County shares its northern border with the City of Baltimore in the Brooklyn Park and Pasadena/Marley Neck areas. The 2013 PBMP includes four (4) potential connections between Anne Arundel County and the City of Baltimore, each along a State-maintained route. The County should work with the City as well as SHA to determine the best approach for the provision of pedestrian and bicycle facilities between these jurisdictions.

The City of Baltimore is currently updating their Bicycle Master Plan, originally adopted in 2006. They are currently accepting public comment via an online survey on user behavior and route preference.

## 7. Fort Meade

Fort George G. Meade (Fort Meade) is located in the western portion of Anne Arundel County near the Odenton area. The installation has experienced significant growth in recent years due to the Base Realignment and Closure (BRAC) process implemented by the Department of Defense. Fort Meade offers commuters several options to utilize transit for their commutes such as vanpools, a transit shuttle, Guaranteed Ride Home program and a benefit program to offset transit costs.



Public input collected through the master planning process suggested that coordination efforts with Fort Meade are necessary to provide improved bicycle access to the installation for commuters. Bicycle access should be considered at each of the installation gates for commuters from both Anne Arundel and Howard Counties. Hours of operation should also be considered. The Maryland State Highway Administration (SHA) has identified a “commuter route” from Howard County to Fort Meade and is currently seeking comment on this route. Additionally, SHA is completing project planning studies of two major roadways adjacent to Fort Meade (MD 175 & MD 198), both of which include provisions for bicycle travel. These proposed facilities should be taken into consideration when planning bicycle access to Fort Meade.

**8. Howard County**

Anne Arundel County shares a portion of its western border with Howard County. The 2013 PBMP identifies two potential pedestrian and bicycle projects which connect to Howard County (MD 175 and Hanover Road). These locations correspond to plan recommendations from the 2002 Howard County Pedestrian Plan. Howard County is currently developing a Bicycle Master Plan. Anne Arundel County should coordinate with Howard County to ensure bicycle connections are consistent along jurisdictional borders to facilitate regional connectivity. Both the Hanover Road and MD 175 connections have the potential to create pedestrian and bicycle transportation alternatives between residential areas and major employment destinations such as Fort Meade and the BWI Business District. Both counties should continue coordination with SHA on the MD175 Project Planning Study which includes significant pedestrian and bicycle facility improvements. To date, only intersection improvements to improve capacity are funded.

**9. Maryland Department of Transportation**

MDOT is currently leading an effort to complete an update of the statewide Bicycle and Pedestrian Master Plan. The current version of the Plan was completed in 2002 (2002 Bicycle and Pedestrian Access Plan). The Plan will provide guidance and investment strategies to support cycling and walking, both on-road and off-road, as part of a multimodal transportation network for the State of Maryland. Anne Arundel County should coordinate with MDOT and other project stakeholders to assist in the identification and inclusion of potential projects in the statewide Plan update. Coordination in the planning phase will position the County for the opportunity to take advantage of potential future funding sources. The Plan update is scheduled for a Fall 2013 Draft and a January 2014 Final Plan release.

**10. Maryland State Highway Administration (SHA)**

Anne Arundel County should coordinate with the SHA Bicycle and Pedestrian Coordinator in order to develop planning and implementation strategies for pedestrian and bicycle improvements along State routes. The SHA Bicycle and Pedestrian Coordinator is involved in the ongoing effort to update the statewide Bicycle and Pedestrian Master Plan, being led by MDOT. It is essential for the pedestrian and bicycle projects along State routes from the 2013 PBMP to be recommended for inclusion in the statewide Bicycle and Pedestrian Master Plan.

Efforts should also be taken to identify potential SHA roadway improvement projects already in planning or design which may have the ability to accommodate pedestrian or bicycle improvements. At the very least, SHA roadway improvements should not be implemented in such a way as to preclude the possibility of future pedestrian or bicycle facilities. Additional coordination on funding is necessary to make sure that pedestrian and bicycle facilities are included in CIP requests.

The County should also coordinate with SHA to achieve statewide goals such as regular performance measure reporting on bicycle facility use and the updating of the GIS Bicycle Portal (through the eGIS database) which shows bicycle facilities by District.

#### **11. Prince George's County**

Anne Arundel County shares a portion of its western border with Prince George's County. The 2013 PBMP identified two potential pedestrian and bicycle projects along this boundary.

In the Jessup-Maryland City area there is the potential for an enhanced bicycle connection along Laurel Fort Meade Road (MD 198) which would connect with the pedestrian and bicycle improvements that are planned as part of the SHA MD 198 Project Planning Study to the east. A continuous bicycle connection along MD 198 would connect Prince George's County with the Fort Meade area, a major regional employment destination.

The second potential connection between counties would link the two main segments of the Washington, Baltimore and Annapolis (WB&A) Trail, connecting the Lanham area to the Odenton Area in Anne Arundel County. This connection involves a complex crossing of the Patuxent River which is currently funded for design through the Maryland Bikeways Program (FY13).

Anne Arundel County should coordinate with Prince George's County to work towards the implementation of these boundary connections.

### **D. Funding Opportunities**

The identification and evaluation of potential pedestrian and bicycle projects for Anne Arundel County is only the first step towards the planning, design and implementation of improvements. In order to progress into the necessary phases of planning, design and construction, project funding must be secured. Chapter VI of this document includes changes to County policy which will help to establish additional local funding for pedestrian and bicycle projects (such as the use of Impact Fees and a Fee in Lieu of Construction Program); however, funds will need to be secured from alternate funding sources.

Finding funding for pedestrian and bicycle projects can be challenging. As mentioned above, it is imperative for the County to identify pedestrian and bicycle projects as a high priority to the State to ensure that the various improvement projects requiring capital investment through the CIP remain competitive with the various needs throughout the state for funding.

In addition, there are numerous other funding sources through the State that the County can consider. Finally, any type of match program the County can facilitate with the State will make

these projects more competitive for implementation. The various funding sources are listed in the sections which follow.

## **1. MAP 21 – Transportation Alternatives Program**

The Federal Highway Administration (FHWA) adopted Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21) in July 2012. The Transportation Alternatives Program (TAP) is authorized under MAP-21 to provide funding for programs and projects defined as:

*“...transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail program projects; safe routes to school projects; and projects for the planning, design or construction of boulevards and other roadways largely in the right-of-way of former Interstate System routes or other divided highways.”*

The national total for TAP funding through MAP-21 for FY13 is \$809 million. Funding increases in FY14 to \$820 million for a total two year allocation of over \$1.6 billion (2% of all MAP-21 funding). Each state's TAP funding is determined by dividing the national total among the states based on each state's proportionate share of FY 2009 Transportation Enhancements funding. Of the remaining funds 50% are suballocated by population (density) and the other 50% are available for any area of a state. A significant change from the previous FHWA funding structure is that Safe Routes to School funds are no longer set aside. They are still eligible, but as a part of the TAP program only.

## **2. Maryland Bikeways Program Grants**

In April 2013, Acting Transportation Secretary Darrell B. Mobley announced that \$4 million in Bikeways Grants was available to fund design and construction of bicycle enhancements. In a press release, Mobley stated that “through strategic investment in the bicycle network, Maryland and our partners hope to stimulate the economy, protect the environment and improve physical fitness.” The fund was established in 2011 and has supported 48 projects totaling a \$5.63 million investment to date. Projects which have won the grant in the past include on and off-road bicycle connections, bicycle route signage, bicycle racks and safety improvements. Projects are eligible along both local and State roads as well as off-road trails and paths.

Anne Arundel County was awarded funding for two projects in the FY 2013 Bikeways Program funding allocation:

- Minor Retrofit – BWI Trail signing and wayfinding enhancements (\$30,000)
- Feasibility Assessment and Design – WB&A Trail bridge over Patuxent River (\$560,000)

### 3. Additional State Funding Sources

The following funds and programs are available through the State:

- **ADA Retrofit (Fund 33):** This is a fund to retrofit existing, non-compliant sidewalks to the latest ADA standards. This includes improvements to sidewalks, curb ramps, and driveway entrances. Pedestrian signals are also eligible under this fund. Projects are prioritized according to “heat maps” which correlate to pedestrian generators within segments of non-compliant sidewalk. Citizen request is also a factor in prioritization. The annual funding level is approximately \$10-\$12 million.
- **Access to Transit (Fund 78):** This is a fund to provide short connections and upgrade access to transit stops (bus, light rail, and heavy rail) with sidewalks along State roadways. Projects are prioritized based on “heat maps” which correlate to transit stops and other pedestrian generators with segments of missing or non-compliant sidewalk. The annual funding level is approximately \$5 to \$6 million through FY13.
- **Sidewalk Retrofit (Fund 79):** This is a fund to construct missing sidewalk segments to fill gaps within the pedestrian network. Per Section 8-630, local jurisdictions must support the project in writing and agree to: securing the right-of-way; maintaining the facility once constructed; providing an opportunity for public input if needed; and, typically fund a portion of the construction cost. Projects in Sustainable Communities or “Designated Neighborhoods” may receive full State funding. Projects in Priority Funding Areas (PFAs) require at minimum, a 25% local match. Other eligible projects require a 50% local match. The annual funding level is approximately \$1.5 to \$3 million.
- **Bicycle Retrofit (Fund 88):** This is a fund to provide bicycle improvements along State roadways. The fund provides for the design and construction of on-road bicycle facilities with shoulders, signing and marking. The fund also covers the design and construction of off-road adjacent bicycle facilities. Other uses include the installation of bicycle racks and other amenities. The fund evaluates opportunities to balance motor vehicle and bicycle needs through pavement marking and road diets.
- **Community Safety and Enhancement Program (Fund 84):** This is a fund for “streetscape” projects to promote safety and economic development.
- **Transportation Enhancement Program (TEP):** This program funds a variety of transportation related projects. In relation to bikeways and trails, TEP funding can be used to construct pedestrian and bicycle trails adjacent to abandoned railroad corridors; installation of pedestrian and bicycle amenities at intermodal

nodes or trailheads; and construction or rehabilitation of bicycle and pedestrian facilities for off-road trails, trailheads, bicycle parking, bicycle lane striping that is part of an off-road system, bicycle and pedestrian bridges, and underpasses.

- **Maryland Highway Safety Office (MHSO) Grant Programs:** The MHSO funds projects for bicycle safety. One such example of this fund is the development of a training program for local law enforcement on bicycle laws and enforcing bicycle laws. Another project funded through a MHSO grant is the “Bicycle Ambassador” project in coordination with BikeMaryland. Through this outreach project in Baltimore City, adults are educated on safe bicycling techniques to be ambassadors for bicycle safety.

#### **4. Community Fundraising and Partnerships**

Anne Arundel County should also look for opportunities to create partnerships with community businesses and advocacy groups to raise funding for pedestrian and bicycle improvements. Local businesses or area business associations should be informed on the positive impact having bicycle facilities such as bicycle racks may have on their business. The County should work to provide facilities along transportation routes to link users with destinations, but businesses should be encouraged to supply parking for shoppers traveling by bicycle.





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