



## **Section 4: Pedestrian Improvement Zones and Prioritized Bicycle Network Plan**

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The Pedestrian Improvement Zones and Prioritized Bicycle Network Plan identifies needed connections in order to create a countywide network of bicycle routes and pedestrian improvements. The network identifies locations where facilities are needed to eliminate the gaps in the regional network, connections needed to existing and proposed facilities in adjacent small planning areas. Location of pedestrian improvement zones and the prioritization of the bicycle route network are based on the following criteria:

- ❑ Bicycle Level of Service Analysis
- ❑ Ease of Implementation/Cost
- ❑ Network/Transit Connectivity
- ❑ Small Planning Area Public Support
- ❑ Areas for Pedestrian Improvements

Each of these criteria are discussed in more detail below.

It is important to recognize that the zones and routes shown on the map are not currently well suited for bicycle and walking. The map is not intended to identify safe locations to bicycle and walk; rather, it identifies locations where this travel is desired but not presently accommodated.

### **4.1 Analysis Process**

#### **Bicycle Level of Service Analysis**

The Bicycle Level of Service (LOS) Model is recommended to determine the most appropriate cross-section for roadways where bicycle facilities are being considered. This recommendation is consistent with the anticipated adoption by SHA of the bicycle suitability model as the standard for analyzing on-road bikeways. What follows is a basic explanation of how Bicycle LOS can be used to determine the appropriate cross-section on a given roadway.

The Bicycle LOS Model is a scientifically calibrated method of evaluating a bicyclist comfort level on a roadway given existing bicycling conditions. It is based on standard roadway factors such as:

- Lateral separation between bicyclists and adjacent motor vehicle traffic (measured by the width of the right-most lane)
- Volume and speed of motor vehicle traffic
- Percentage of trucks
- Number of travel lanes
- Presence of a paved shoulder/bike lane
- Pavement conditions



**Table 1.1 Bicycle Level of Service Categories**

Level of Service	Bicycle LOS Score
A	<= 1.5
B	> 1.5 and <= 2.5
C	> 2.5 and <= 3.5
D	> 3.5 and <= 4.5
E	> 4.5 and <= 5.5
F	> 5.5

The results of the Bicycle LOS evaluation are represented by a numerical score, which is stratified into six grades or levels of service (see Table 1). Level “A” reflects the best conditions for bicyclists; Level “F” represents the worst conditions. Details about the Bicycle LOS Model are presented in Appendix B.

The Bicycle LOS Model should be used to determine the appropriate cross-section (bicycle accommodation) on a given roadway. The impact of proposed bicycle accommodations on vehicle level of service can then be analyzed in an effort to maintain the existing conditions for motor vehicles while improving conditions for bicyclists.

Bicycle LOS Example

Increased Shoulder			Lanes (L)		Traffic Data		Post Spd. (SPP) mph	Width of Pavement			Occu. OSP % (OSPA) (%)	Pvmt. Cond. (PR <sub>3</sub> ) (1..5)	Bicycle LOS	
Route Name	From	To	Th #	Con.	Vol. (ADT) (vpd)	Pct. (HV) (%)		(Wt) (ft)	(Wl) (ft)	(Wps) (ft)			Score	Grade (A-F)
Mt. Road	Alvin Rd.	Schmidts Lane	3	U	17,875	8	40	15	3	0	0	3.0	5.14	E
		Alternative	3	U	17,885	8	35	17	6	0	0	3.0	3.10	C

Th = # of travel lanes

Con. = lane configuration

Vol(ADT) = volume of average daily traffic rates

Pct. (HV%) = percent of heavy vehicle travel

Post Spd. = posted speed limit (mph)

Wt = total width of outside lane (feet)

Wl = width of paving between outside lane stripe and edge of pavement (feet)

Wps = width of parking spaces (feet)

Occ = percentage of segment with occupied on-street parking

Score = bicycle LOS score

Grade = Rating of segment

There are a number of routes that have been identified for pedestrian and bicycle improvements that are already scheduled for roadway capacity improvements. This represents an opportunity to include bicycle and pedestrian facilities at a lower cost, as part of a larger roadway-widening project.



## Ease of Implementation and Cost

The level of difficulty and cost for constructing facility improvements can be used to prioritize potential improvement areas. The Network Plan addresses this issue in order to provide recommendations that can be built quickly and efficiently. The following list identifies some of the key issues when looking for relatively low cost and easily implemented facility improvements.

- Existing paved roadway shoulders
- Potential for restriping the road
- Wide designated right of ways
- Projects scheduled for future roadway improvements
- Eliminating short gaps in the existing sidewalk network
- Repairing older sidewalks
- Improving ADA accessibility in vital locations
- Adding high visibility crosswalks
- Streetscape improvements/buffering from traffic (i.e. adding street trees)
- Pedestrian and bicycle signage
- Trail connections at key locations

## Network/Transit Connectivity

Identifying routes that increase the connectivity of the network is a vital component of the Network Plan. The desired goal is to eliminate gaps in the existing network, with an eye toward achieving a system of facilities that is fully interconnected.

- Connecting to existing trail and on-road networks.
- Connecting to private developed trail networks.
- Connecting to destinations such as commercial areas, recreation facilities, neighborhoods and schools.
- Addressing intersection issues within the on-road network.

## Small Area Planning Public Support

The purpose of the Small Area Planning process in Anne Arundel County is to enhance the quality of life in communities, to help implement the goals and recommendations of the General Development Plan, and to promote citizen, business and County cooperation in the planning and development process. Within these plans, a section was devoted to identifying potential improvements for pedestrian and bicycle facilities, trails and greenways. This planning process provided a forum for public concern and comment in sixteen planning areas within the County. At the time of this writing, plans substantially completed and/or adopted include:

<i>Annapolis Neck</i>	<i>Broadneck</i>	<i>Crownsville</i>	<i>Crofton</i>
<i>Edgewater/Mayo</i>	<i>Severna Park</i>	<i>BWI-Linthicum</i>	<i>Deale/Shadyside</i>
<i>Jessup/Maryland City</i>	<i>Odenton</i>	<i>Severn</i>	<i>South County</i>

The remaining small area plans are currently underway. They include:

<i>Glen Burnie</i>	<i>Brooklyn Park</i>	<i>Lake Shore</i>	<i>Pasadena/Marley</i>
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These plans were used to gather public input regarding pedestrian and bicycle improvements throughout the County. For the areas that had not yet started their small area planning process, a special meeting was held to collect additional input regarding pedestrian and bicycle improvements.

### **Areas for Pedestrian Improvements**

The purpose of identifying potential locations for pedestrian improvements is to develop a working pedestrian network that address gaps and critical areas that need physical improvements.

- Identify gaps in the existing sidewalk network
- Identify areas that need ADA accessibility in vital locations
- Identify high use intersections that need pedestrian improvements

## **4.2 Overview of the Network Plan**

This Network Plan is a map produced as a part of the master plan process showing the locations of County routes, existing conditions and potential improvement areas. The map depicts Tier 1 recommended improvements, Tier 2 recommended improvements, recommended pedestrian improvement zones, signed shared roadways, corridor plan locations, existing trails, proposed trails, colleges and universities, schools, transit stations, streets, railroads, parks, county boundary, City of Annapolis, and major bodies of water. The following is a list of definitions regarding key items identified on the Network Plan.

### ***Tier 1 Recommended Improvements:***

These corridors are considered high priority locations for pedestrian and bicycle improvements. The specific type of improvement for each corridor will be determined by further investigation. Once improved, these routes will form the backbone of the on-road bicycle and pedestrian network.

### ***Tier 2 Recommended Improvements:***

These designated routes are also recommended for pedestrian and bicycle improvements when opportunities arise in the future to make such improvements.

### ***Recommended Pedestrian Improvement Zones:***

These areas are high priority locations needing pedestrian improvements. The improvement zones shown on the map will eliminate critical gaps in the network and improve safety for pedestrians. Although general types of improvements have been described for these areas (see Section 5.2), specific solutions for each zone will be determined by further investigation.

### ***Corridor Locations:***

The corridor locations were areas chosen for further analysis and to serve as examples (illustrative purposes only, found in Appendix A) of a variety of bicycle and pedestrian improvements.

### ***Proposed Trails:***

Depicts locations of proposed off-road trails in Anne Arundel County.



***Existing Trails:***

Depicts locations of existing trails in Anne Arundel County (primarily those that are suited for transportation use).

***Signed Shared Roadways:***

Existing roadways that have been designated by signage in order to caution motorists to share the road with bicyclists.



### **4.3 Network Recommendations**

The Tier 1 Recommendations shown on the network map indicate important segments that need to be retrofitted in order to better accommodate walking and bicycling. These routes are the highest on the list for pedestrian and bicycle improvement projects. They were selected because they connect to key destinations throughout the County, and represent some of the most important (and often difficult) areas where bicycle access is needed. Even though some of the Tier 1 routes are located on State roads, they are still key components to building the core network for pedestrian and bicycle transportation. The public has noted that proposed improvements on State routes will improve the overall connectivity of the route network and provide immediate access to a variety of destinations. It is also necessary to suggest state roads for improvements to denote that state roads are vital components within the Anne Arundel County Route Network.

The Recommended Pedestrian Improvement Zones are areas designated as potential places for pedestrian oriented redesign. The areas chosen were based upon small area plan recommendations, public participation and fieldwork. These improvement zones will be vital network connections and immediately improve pedestrian safety.

Design solutions for these roadways will range from simple low cost solutions to complex engineering and design projects. Below is a list of Tier 1 Recommendations and Recommended Pedestrian Improvement Zones. Please note that some of the Tier 1 Recommendations are also listed as high priority routes designated by the Baltimore Regional Transportation Board (BRTB) in its bicycle, pedestrian and greenway plan.

#### **Tier 1 Recommended Improvements**

<b>Area of Anne Arundel County</b>	<b>Tier 1 Recommendations</b>
<b>Annapolis Area (County)</b>	<b>Northern Loop</b> from Defense Highway along Housley Road to Generals Highway, then along Bestgate Road and Ridgely Avenue to Taylor Avenue. (BRTB Plan)
<b>Annapolis Area (County)</b>	<b>Riva Rd.</b> from Aris T Allen Blvd. To West St.
<b>City of Annapolis</b>	<b>King George St.</b> from Taylor Ave. to College Ave.
<b>Annapolis Area (City and County)</b>	<b>Forest Dr/Chinquapin Round Rd./Bay Ridge Rd./Arundel on the Bay Rd.</b> from Solomons Island Rd. and West St. to Arundel on the Bay.
<b>Parole Area</b>	<b>Riva Rd.</b> From West St. to Annapolis S.H.S.
<b>Parole Area</b>	<b>Parole Area.</b> From Solomons Island Road along West St. and Generals Highway to Bestgate Road, and from West Street along Defense Highway to Housley Road.
<b>Cape St. Claire</b>	<b>College Parkway</b> from Saint Margarets Rd. (MD 179) to Sandy Point State Park (BRTB)
<b>Pasadena Area</b>	<b>Mountain Rd.</b> from Hogneck Rd west to Old Annapolis Blvd.
<b>Lake Shore Area</b>	<b>Hogneck Rd.</b> From Ft. Smallwood Rd. to Mountain Rd.



Lake Shore Area	<b>Edwin Raynor Blvd.</b> From Ft. Smallwood Rd. to Magothy Bridge Rd.
Riviera Beach	<b>Ft. Smallwood Rd.</b> From Marley Neck Rd. to Ft. Smallwood Park
Shadyside Area	<b>Shadyside Rd.</b> from Shadyside Park to Deep Cove Road
Crofton Area	<b>Crain Highway</b> from Millersville Rd. to Defense Highway. (BRTB)
Crofton Area	<b>Davidsonville Rd.</b> from Crain Highway to Defense Highway
Crofton Area	<b>Reidel Rd.</b> From Davidsonville Rd. to Crain Hwy.
Laurel/Maryland City Area	<b>Laurel Fort Meade Rd. (Rt. 198)</b> from the Prince George County line to Route 32 & Rockenbach Rd
BWI Airport Area	<b>Ridge Rd.</b> to MD 100
Brooklyn Park Area	<b>Belle Grove Rd.</b> from Governor Ritchie Hwy to the B&A Trail (BRTB)
Brooklyn Park Area	<b>Governor Ritchie Highway</b> from Belle Grove Rd. to Furnace Branch Rd. (BRTB)

### **Recommended Pedestrian Improvement Zones**

<b>Area of Anne Arundel County</b>	<b>Recommended Pedestrian Improvement Zones</b>
<b>Woodland Beach/Edgewater</b>	Solomons Island Road between Central Ave. and Mayo Rd.
<b>Arnold/Severna Park Area</b>	College Parkway and Governor Ritchie Highway (Rt. 2) connection to the B&A Trail.
<b>Severna Park Area</b>	Intersections of McKinsey Rd. and Governor Ritchie Highway (Rt. 2)
<b>Gambrills</b>	Crain Highway between Davidsonville Rd. and Defense Highway
<b>Odenton</b>	Annapolis Rd.-Connections to MARC and proposed Town Center.
<b>Riviera Beach</b>	The intersection of Fort Smallwood Rd and Bar Harbor Rd.
<b>Glen Burnie</b>	The intersection of Dorsey Rd and B & A Blvd.
<b>Near Baltimore City</b>	Intersection of Hammonds Ferry Rd. and Nursery Rd.
<b>Near BWI Airport</b>	Intersection of Dorsey Rd and Aviation Blvd.
<b>Laurel/Fort Meade</b>	Intersections of Laurel/Fort Meade Rd (Rt 198) and Corridor Rd/Russet Green East Rd.
<b>Parole/Annapolis Area</b>	West St. between Solomons Island Rd and Riva Rd.
<b>Parole Area</b>	Areas to include various intersections and corridors along Generals Hwy/Defense Hwy /West St/Bestage Rd.



## Next Steps

- ❑ Conduct a Bicycle Level of Service analysis on Tier 1 Recommended Routes and recommend design treatments during improvement projects (see Appendix A: Conceptual Corridor Plans for examples).
- ❑ Conduct more detailed design studies for intersection locations.
- ❑ Implement projects independently and in conjunction with roadway improvements.