Biking & Hiking Functional Master Plan

For the Salisbury / Wicomico Metropolitan Area

June 2012

Urban Research & Development Corporation
Bethlehem, Pennsylvania

BIKING & HIKING FUNCTIONAL MASTER PLAN

FOR THE SALISBURY / WICOMICO METROPOLITAN AREA

Prepared For:

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CHAPTER 1 - INTRODUCTION

This opening chapter introduces the Salisbury/Wicomico Metropolitan Planning organization (S/W MPO), explains why the S/W MPO prepared this plan, and relates this plan to previous planning efforts already completed.

THE SALISBURY/ WICOMICO METROPOLITAN PLANNING ORGANIZATION

The Salisbury/Wicomico Metropolitan Planning Organization (S/W MPO) performs transportation planning for the Salisbury/Wicomico urbanized area. In Maryland, this urbanized area includes the cities of Salisbury and Fruitland, the Town of Delmar, and a portion of Wicomico County. In Delaware, it includes the Town of Delmar and parts of Sussex County. Maryland Governor Robert L. Erlich formed the S/W MPO in 2004 after the 2000 U.S. Census indicated that the vicinity met federal criteria for becoming an "urbanized area".

The Metropolitan Planning Organizations (MPOs) directs how and where state and federal funds for transportation should be spent. They set these priorities by preparing a Long Range Transportation Plan and maintaining a list of projects to which funds should be allocated. The MPO seeks input from local officials, area stakeholders and the general public to help set goals and make funding decisions.

PURPOSE OF THIS STUDY

This plan analyzes the potential for developing a network of biking and hiking trails in the Salisbury/Wicomico MPO. In the longer-range future, this system could even include links to additional, outlying communities.

The main topics of the plan include the following:

- An overview of existing biking and hiking trails
- A conceptual plan that identifies potential trail corridors
- Recommended guidelines and specifications for designing and constructing different trail types
- An Implementation and Funding section that suggests next steps and funding opportunities for future implementation.

VISION AND GOALS

This plan is a first step. Hopefully, it will lead to more detailed analysis of selected individual trail corridors. Following that, the S/W MPO looks forward to the most promising of those trail corridors being designated for trail funding, design and construction. Over time, the S/W MPO envisions a comprehensive trail network that consists of major trail arteries and other strategic trail connections.

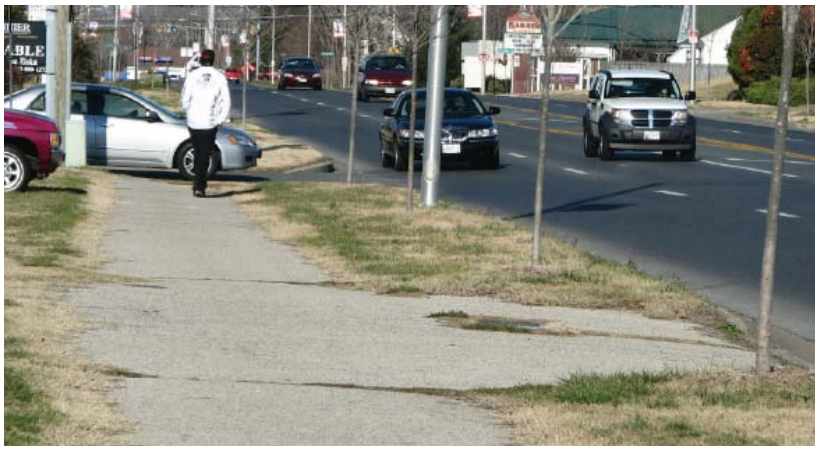
Trail connections will create new links to a variety of key destinations in the metropolitan area. These would include, but not be limited to, schools, parks, places of employment, shopping areas, service areas and other nodes. More transportation options will also increase accessibility to cultural, tourism and historic destinations. In summary, a well-planned trail network in the Salisbury/Wicomico area will be good for personal health, beneficial to the environment, and facilitate economic growth. More public trails will raise the area's quality of life. This, in turn, should attract more people to live here and more investors to locate businesses here.

Specific goals of this plan include the following:

- Enhance on-street bicycle and pedestrian connectivity throughout the metropolitan area.
- Offer trail routes to destinations and transit centers, thereby decreasing dependence on the automobile.
- Promote exercise and improve the quality of life by developing trails, pathways, sidewalks that interconnect where possible.
- Highlight the Salisbury/Wicomico metropolitan area's many water bodies, including the Nanticoke River and the Wicomico River, as ideal locations for more linear greenways.
- Stimulate tourism by improving pedestrian and bicycle trail access throughout the Salisbury / Wicomico metropolitan area and outlying areas. To help achieve these goals, the Salisbury/Wicomico area needs to encourage more trail use. This will require retro-fitting many streets and roads to accommodate trails where none exist now. In addition to roadside trails, off-road trails will be an important component. Some of these off-road opportunities will arise in connection with new land developments, both residential and non-residential.

We hope that an attractive trail network in the Salisbury/Wicomico area will motivate people to exercise more and embrace a more active lifestyle. We also foresee that a biking and hiking network will reduce vehicular traffic and help improve air quality.

Below are examples of trails that have been retrofitted and others that need to enhanced for safe bicyle and pedestrian use.



THE CONTEXT - PREVIOUS PLANS AND RECOMMENDATIONS

The Wicomico County Executive's Council on Physical Fitness & Healthy Living mission statement is to promote and encourage citizens of all ages throughout Wicomico County to adopt a personal goal of physical activity and responsible living habits to ensure a healthy quality of life. The Council will seek to publicize the many on-going efforts across the county designed to promote healthy living and to serve as an umbrella organization for important information and strategics available to achieve the goal. A particular emphasis will be placed on methods and opportunities to combat childhood obesity through the awareness campaigns designed to educate and inform about the real risks of heart disease and diabetes.

The Wicomico County Comprehensive Plan (draft 2010) states:

"The future vision for the County includes a transportation network that is more pedestrian-friendly and less car dependent, which will reduce traffic congestion and air pollution from vehicle emissions" and that "Wicomico County's vision includes having streets that are pleasant to walk along and safe, as well as efficient bike routes to reduce car dependency."

The plan, further notes that bicycle and pedestrian networks provides a sustainable and healthy alternative to motor vehicles. The plan identifies an efficient land use pattern as something that provides greater opportunities for pedestrian / bicycle access and activity. According to the plan, a community with a mix of uses within walking / biking distance will improve access to housing, offices and shopping without using an automobile

In addition to the County-wide plan, all jurisdictions within the S/W MPO region have recognized the importance of bicycle and pedestrian accessibility in their adopted Comprehensive Plans.

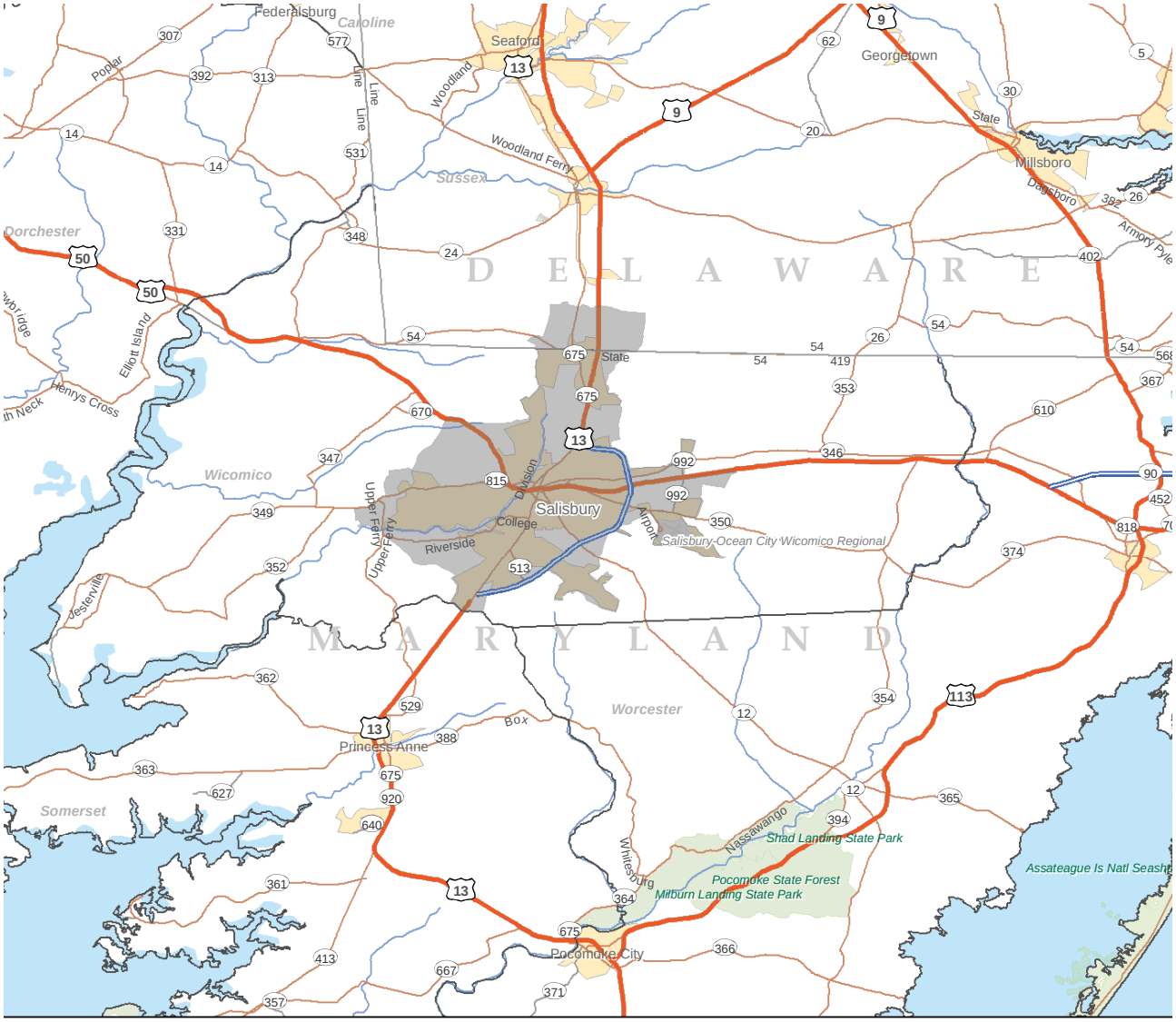
The Land Preservation, Parks and Recreation Plan for Wicomico County includes a policy to expand and promote scenic bicycle routes. The plan indicates that as part of its effort to support a comprehensive countywide bicycle system, the County Department of Planning, Zoning and Community Development should work closely with developers to acquire easements or rights-of-ways for bikeways. A specific challenge cited in the plan was the need for connections throughout the Salisbury/Metro Core communities.

CHAPTER 2 - THE SALISBURY / WICOMICO METROPOLITAN AREA

This chapter profiles population trends in the Salisbury/Wicomico Metropolitan Planning area and Wicomico County. An overview of employment characteristics and travel to work data is provided. An inventory of existing biking trails and hiking trails is included and this information is followed by a description of the State of Maryland's vision for future hiking and biking trails in Wicomico County.

STUDY AREA BOUNDARIES, CHARACTER, & SETTING

The Salisbury / Wicomico Metropolitan Planning Organization (S/W MPO) area consists of the City of Salisbury; the City of Fruitland; the Town of Delmar, Maryland and Delmar, Delaware; and unincorporated areas of Wicomico County, Maryland, and Sussex County, Delaware. Map 1 illustrates the study area, which is centered at the intersection of U.S. Route 13 Business and U.S. Route 50 Business, the two major highways in the area that intersect in downtown Salisbury and is the source of Salisbury's slogan as the "Crossroads of Delmarva". These two major highways act as physical barriers to promoting connectivity of biker and hiker trails within the Study area.



STUDY AREA DEMOGRAPHICS

Population

The 65-square mile Salisbury/Wicomico Metropolitan Planning Organization area is a well developed, steadily growing area. A total population of 50,000 with a population density of at least 1,000 persons per square mile was the federal criteria the region had to meet to become an urbanized area. As of July, 2000, when the urbanized area was formed, the Salisbury/Wicomico MPO area region contained 74,873 residents, almost 98% of which lived in Maryland.

According to the 2010 Census, the City of Salisbury had 30,343 residents in 2010 and the City of Fruitland had a population of 4,866. The other two incorporated areas in the metropolitan area are the Town of Delmar, MD (2010 population 3,003) and the Town of Delmar, DE (2010 population 1,597). No population projections have been done specifically for the Salisbury/Wicomico Metropolitan Area. However, historical data and projections prepared in 2010 by U.S. Census Bureau and the State of Maryland for Wicomico County illustrate that the pattern of growth in the region is increasing.

Wicomico County added approximately 10,00 people in each 10-year census period between 1070 and 2010. Between 2010 and 2030, the US. Census Bureau and the State of Maryland project that Wicomico County will add about 877 residents per year, thereby growing from a total population of 98,733 in 2010 to 120,900 persons in 2035 (a 22.5% growth rate).

Dorchester, Somerset and Worcester are the other three counties that, along with Wicomico, comprise Maryland's Lower Eastern Shore region. None of these three counties is expected to grow as strongly as Wicomico. The U.S. Census Bureau and the State of Maryland predict that Dorchester, Somerset and Worcester counties together will grow by 14.2% over the 25-year period from 2010 to 2035.

Employment and Transportation

Wicomico is also the Lower Eastern Shore's economic leader. The Maryland Department of Planning projects that employment in Wicomico County will grow by more than 14,900 jobs (a 23% increase) between 2009 and 2035. Jobs in Dorchester, Somerset and Worcester counties together are expected to expand by 13% during the same period.

Traditionally, jobs were concentrated in Salisbury's business district and the major arteries radiating outward from that center. Today, employment in Wicomico County is more diverse and more spread out. Penninsula Regional Medical Center (3,300 jobs), Salisbury University (1,700 jobs) and Perdue Farms (1,600) jobs are the largest employers in the Salisbury/Wicomico Metropolitan Planning area. In addition to these traffic-generating businesses, the Metropolitan Planning area contains over 2.2 million square feet of shopping center space and almost 300,000 square feet devoted to "specialty retailers", including, for example, Lowe's, Toys R Us, Gander Mountain and Tractor Supply.

Between 2005 and 2009, almost 93 % of all workers in Wicomico County drove to work, according to the U.S. Census Bureau's American Community Survey. This includes 80.5% driving alone and 12.4% participating in carpools. Data on mean travel time to work indicate that the average commute in Wicomico County is shorter than similar means calculated for Maryland and the nation. In Wicomico County, the average commute to work was 21.6 minutes in 2010, compared to 31.1 minutes statewide and 25.3 minutes in the U.S.

Transportation infrastructure in the Salisbury/Wicomico Metropolitan Planning Area reflects the region's heavy emphasis on travel by car. Route 13, which runs to Dover, Wilmington and Philadelphia, is the major north-south route. In the Metropolitan Planning Area it intersects with Route 50, a primary east-west route that connects Wicomico County with Baltimore, Washington and Ocean City.

SWOT ANALYSIS

A SWOT anaylsis was conducted to formulate "Strengths, Weaknesses, Opportunities and Threats" within the Saslibury / Wicomico Metropolitan Area. This analysis focuses on existing and future conditions to identify areas of need and improvement for a safe and successful biking and hiking experience.

Strengths

- Abundance of flat, long, rural roadways
- Tourist destinations for cycling
- Local and regional parks
- Salisbury University

Weakness

- Lack of connectivity
- Lack of wayfinding system
- Lack of public transit infrastructure for bicycles
- Lack of funding/sponsorship programs
- Lack of overall trails identity

Opportunities

- Expansion of existing trail system
- Connections to regional parks
- Public / private partnerships
- Residential / commercial / industrial expansion and redevelopment
- Better known tourist destinations

Threats

- Preservation of existing historic routes / corridors
- Lack of available publicly-owned lands

EXISTING BIKING & HIKING TRAILS

The existing transportation system in the study area is predominately for vehicular travel. This has been to the detriment of the pedestrian, but even more so for the bicyclist. An extensive sidewalk system exists that links every neighborhood, employment and central business area within the urban core. Problems have evolved as metropolitan development has expanded along old, narrow, existing rural roads that were not planned at the time to accommodate either on-road and/or off-road bicycle trail facilities. Like most rural areas across the U.S., the local transportation system was not designed for non-motorized forms of travel. This plan will allow the S/W MPO to plan for future trail systems, creating options for pedestrian and bicycle modes of transportation.

Biking Trails

There a are five examples of established, operating biking trails in the Salisbury / Wicomico Metropolitan Planing area. Each of these trails includes the design features that make for a safe biking experience, such as a paved path, signs, and road markings where applicable. Map 2 (page 10) shows all existing bike trails within the Metro Area.

Beaglin Park Drive Hiking Trail and Bikeway - A multi-use, off-road trail exists on the west side of Beaglin Park Drive from E. Gordy Road to Shamrock Drive. In addition, another portion of this trail exists from Tamarac Drive to S. Schumaker Drive. The trail came into existence as part of the approvals for a large scale development plan for this area. When fully completed the trail will be an estimated length of 1.2 mile.

Ocean Highway / U.S Route 13 (South Salisbury Boulevard) - This is a biking trail that begins at Cedar Lane & Division Street and is separated from the roadway by a wide grass area. At one location, along U.S. Route 12, due to a bridge, the trail is located on the shoulder of the road, but separated by paint markings designating it as a bikeway. The trail than proceeds north to Mack Lane, where it abruptly stops. The existing portion of the route is an estimated 0.4 mile.

Wicomico Tourism Visitor's Center and Leonard Mill Pond Park Trail - This trail begins at Connelly Mill Road, connects to the Visitor's Center and then traverses Leonard Mill Pond Park. It almost but not quite connects with Dagsboro Road. The existing portion of the route is an estimated 0.16 mile.

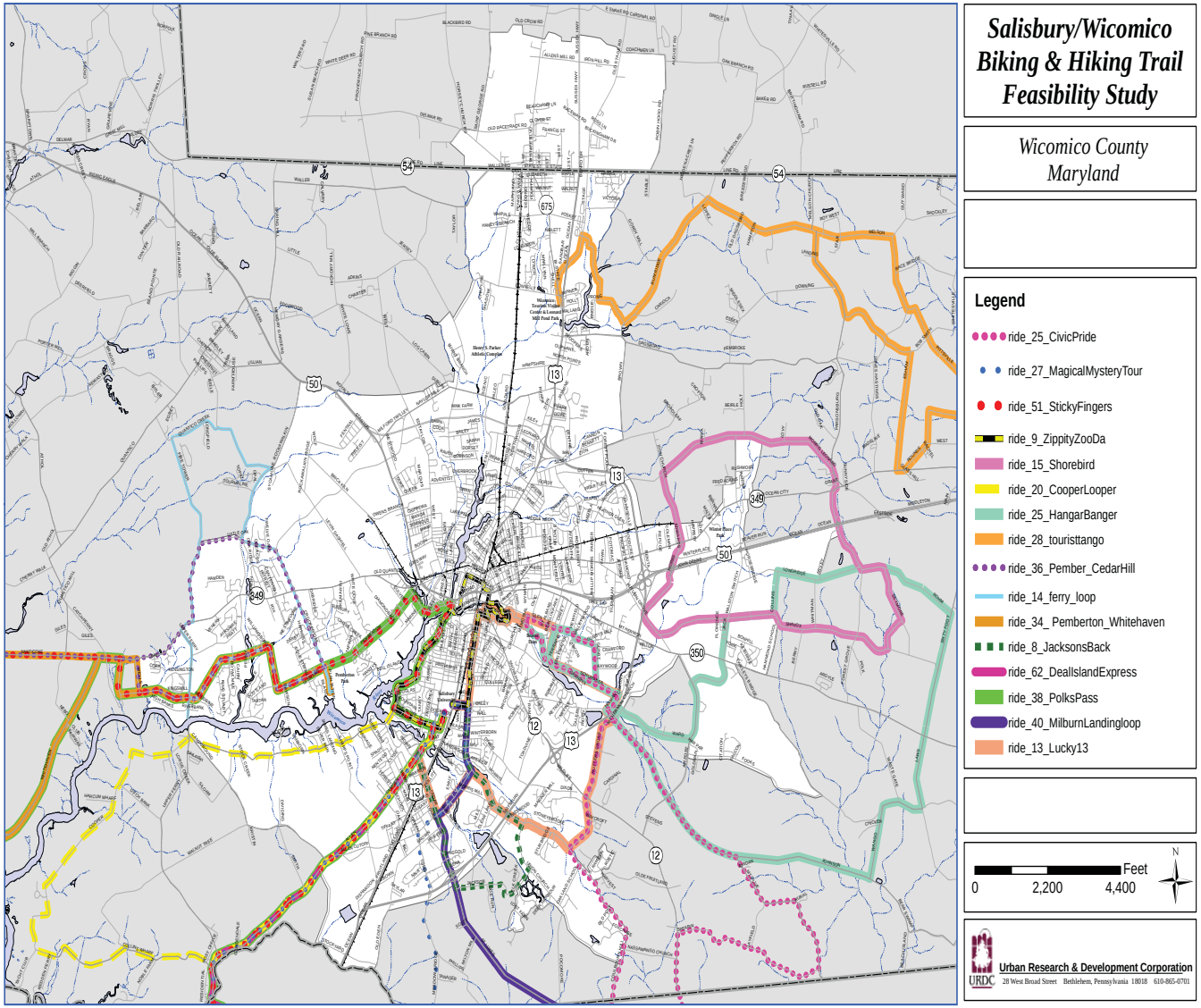
Riverside Drive Share the Road Trail - This designated share the road biking trail begins at Wicomico Street and ends at College Avenue. This trail is possible because Riverside Drive in this area is wide enough for a designated parallel bike trail and one of the few streets within the metropolitan area having these characteristics. The existing portion of the route is an estimated 0.4 mile.

N. Upper Ferry Road Share the Road Bike Trail - This is a designated on the road shoulder trail along the west side of Upper Ferry Road from Nanticoke Road to Pemberton Road. It represents an example of a designated shoulder bike trail within a rural area. The existing portion of the route is an estimated 1.0 mile.

Naylor Mill Road extension - An off-road trail exists from U.S. 50 to Brick Kiln Road. Future roadway improvements and extensions have plans already in place to extend the trail west to Route 346 (Nanticoke Road). The existing portion of the route is an estimated 0.9 mile.

In addition to designated trails currently in operation, Wicomico County and the non-profit Lower Eastern Shore Heritage Council have worked together to complete a Bicycle Touring Route Project. In this project, the two groups identified bicycle routes on established roads that residents and visitors use for both special bicycling events and informal riding. Most of these routes are oriented to bicycle riders rather than hikers. While they include segments within the S/W MPO , most of the length of each route is located in rural areas outside the S/W MPO vicinity. All of these routes are located on roadways but only a few feature any designated bikeway signage or other identifying roadway markings. Each trail's name, the length of the trail and its location relative to downtown Salisbury is depicted. The bike routes designated jointly by Wicomico County and the Lower Eastern Shore Heritage Council include the following:

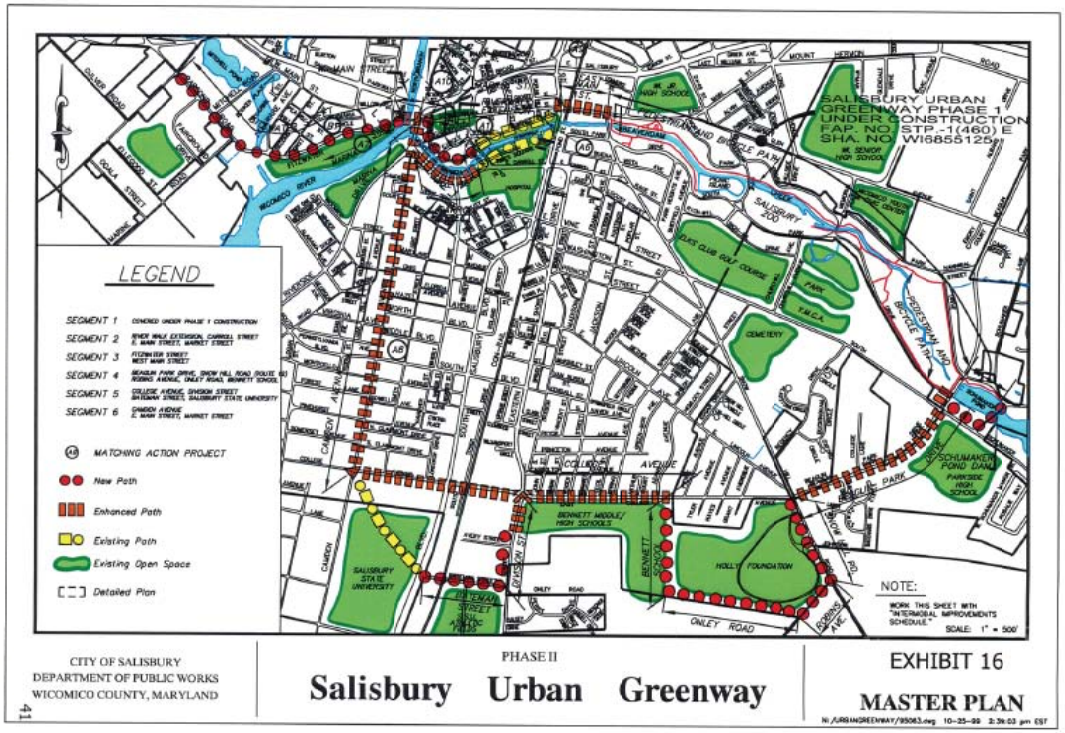
Route 8 - Jackson's Back (8.0 miles)
Route 9 - Zippity Zoo Da (9.0 miles)
Route 13 - Lucky 13 (13.5 miles)
Route 14 - Ferry Loop (14.5 miles)
Route 15 - Shorebird (14.9 miles)
Route 20 - Cooper Looper (19.8 miles)
Route 25 - Civic Pride (24.5 miles)
Route 25B - Hanger Banger (25.2 miles)
Route 27 - Magical Mystery Tour (26.7 miles)
Route 28 - Tourist Tango (27.3 miles)
Route 34 - Pemberton Whitehaven (34 miles)
Route 36 - Pemberton Cedar Hill (36 miles)
Route 38 - Polka Pass - CBD (39.3 miles)
Route 40 - Milburn Landing Loop (40.5 miles)
Route 51 - Sticky Fingers (55.9 miles)
Route 62 - Deals Island Express (62.8 miles)



Hiking Trails

Hiking trails are largely located in the regional parks located within the Metropolitan area. These trails provide opportunities to walk along waterways, woodlands and other natural areas. The Wicomico Department of Recreation, Parks, and Tourism maintains a number of other hiking trails throughout the County, including the following:

- Adkins Mill (0.5m mile)
- Cedar Hill Park and Marina (0.8 mile)
- Leonards Mill (0.5 mile)
- Naylor Mill Park (7.0 mile)
- North Lake Park (0.3 mile)
- Pemberton Historical Park (5.0 mile)
- Riverwalk Park (1.0 mile)
- Winter Place Park (2.0 miles)



The City of Salisbury planned an Urban Greenway route which would connect the downtown, Wicomico River, parks, schools and neighborhoods together. This multi-phased plan is incorporated into the *Biking & Hiking Functional Master Plan.*

DEMAND FOR MORE BIKING & HIKING TRAILS

Maryland's vision for bicycle and pedestrian mobility is embodied in the State's *20 Year 2002 Bicycle and Pedestrian Access Master Plan* (*http://www.mdot.state.md.us/Planning/Bicycle/BikePedPlan*). Mandated by the Bicycle and Pedestrian Access Act of 2001, the Plan demonstrates Maryland's support of bicycle and pedestrian travel throughout the state. The Technical Appendix to the 2002 Bicycle and Pedestrian Access Master Plan states that there are 73.93 miles of state-owned roadways in Wicomico County that need bicycle and pedestrian improvements. The Technical Appendix also outlines a model for developing regulatory tools (i.e. land use regulations) to promote pedestrian and bicycle facilities and access.

In order to achieve these goals, the Salisbury / Wicomico area will need to be altered to accommodate hiking and biking trail users. Many roadways and streets will need to be retro-fitted to support pedestrian and bicycle use. Off-road trails, where possible, will need to be built as opportunities arise. Some of these opportunities will come with the development as new neighborhoods evolve and will require creative planning and development guidelines.

FUTURE ROADWAY IMPROVEMENTS

The Salisbury/Wicomico County Department of Planning, Zoning & Community Development updated the Wicomico County Comprehensive Plan in 2010. Through this update, new recommended roadway improvements were planned. These road enhancements are an integral part of creating a successful trail plan. With the future enhancements and additions to the planned roadways, planning for trail development is crucial. For this plan, outlined below are the five immediate priority areas (1-5 years) within the Metropolitan Area.

- Westside Collector - *Naylor Mill Road extenstion from U.S. Route 50 to Crooked Oak Lane.*
  (Note: Naylor Mill Road from U.S. Route 50 to Brick Kiln Road is already completed)

- Johnson Road / Robins Avenue Connection - *New connection connecting Johnson Road to the east to Robins Aveneu to the west across U.S. Route 12 (Snow Hill Road)*

- Culver Road - *Roadway enhancements from Route 349 (Nanticoke Road) to Pemberton Drive.*

- Onley Road / Bateman Street Intersection & Onley Road Extension - *New extension to east to Robins Drive*
  (Note: Onley Road / Bateman St. Intersection completed)

- Parsons Road & Fitzwater Street Reconstruction - *Roadway enhancements from Pemberton Drive to Mill Street.*

CHAPTER 3 - CONCEPT PLAN

The purpose of this concept plan is to identify potential biking and hiking routes within the Salisbury / Wicomico Metropolitan Area. These routes will enhance and create new connections between the existing trail system (See Chapter 2 - The Salisbury / Wicomico Metropolitan Area) and parts the Metropolitan Area that are not presently connected for trail use. The concept plan will assist the S/W MPO in creating a regional biking / hiking community.

ELEMENTS OF THE PLAN

Connecting community and educational facilities to parks and residential areas is a key goal in the S/W MPO. Connecting diverse destinations (hubs) with trails will allow people to access these areas without the use of automobiles, thereby creating healthy links to hubs such as downtown Salisbury, Salisbury University, Peninsula Regional Medical Center, Wor-Wic Community College, shopping districts and parks.

Making connections via trail corridors (spokes) is an essential component of this concept plan. These spokes could include trails that follow waterways, railroad corridors, designated pathways and roadways that are bicycle-and-pedestrian friendly. The development of the trails throughout the region will provide alternatives to vehicles, provide opportunities for recreation and promote healthy lifestyle opportunities.

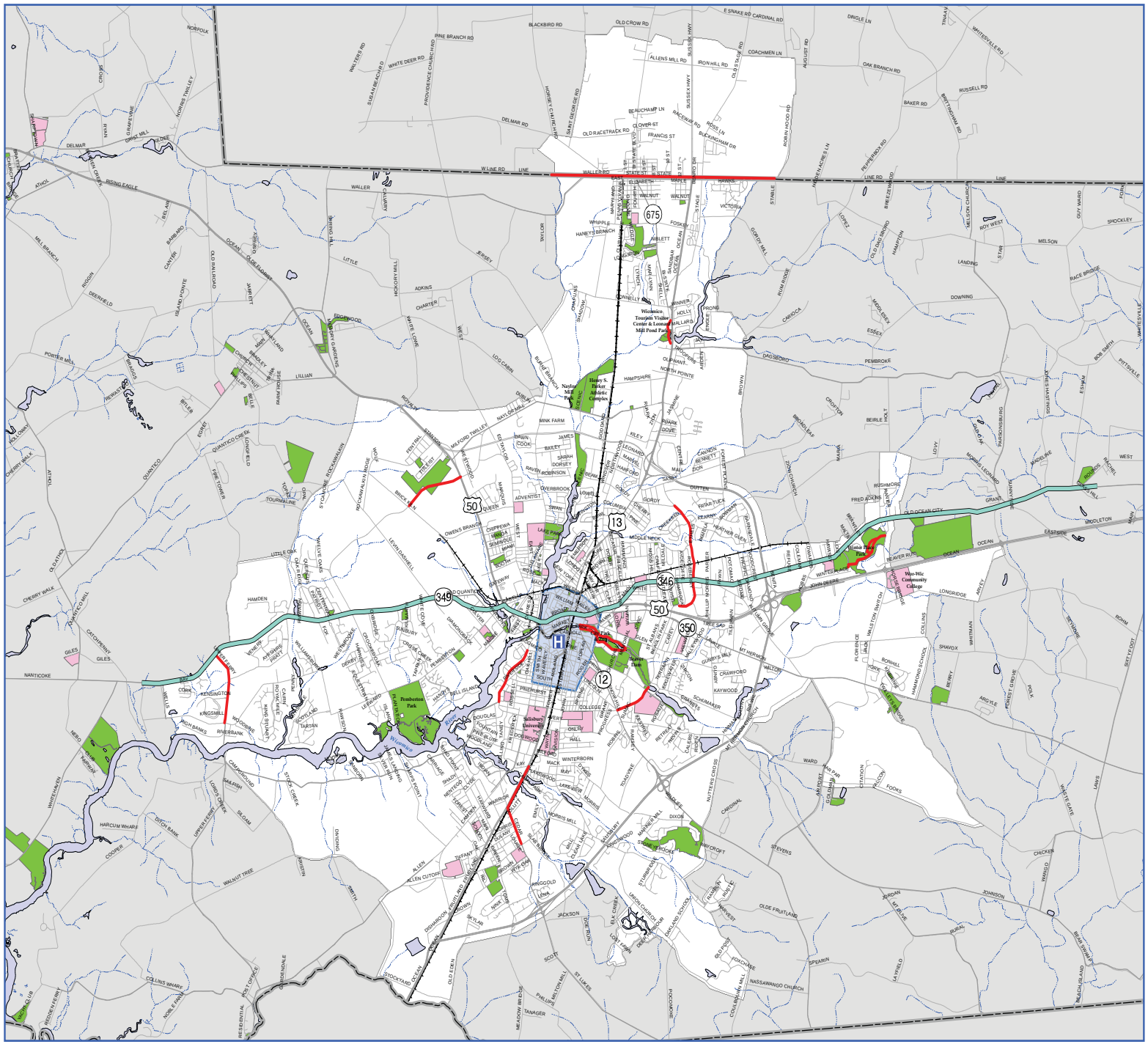
CONCEPT PLAN

The accompanying map is the beginning base for the concept plan for a long-range network of bike trails in the S/W MPO. The plan shows "Existing Corridors" that bikers now use, "Potential Trail Corridors", that bikers could use in the future, and "Existing Parks and Schools", which are locations that could become key hubs, trailheads and destination points in the region's future bike trail system.

Existing Corridors

Existing Biking/Hiking Trail Corridors – These are recognized, established trails that are improved and/or signed for hiking and biking use. While they include both on-road trails and off-road trails, they are very few in number.

Scenic Byways – These are the two roads within the study area that were designated as "Scenic Byways" by the State of Maryland. They include Ocean City Road (MD Route 346), which runs eastward from Salisbury, and Nanticoke Road (MD Route 349), which runs westward from Salisbury.



Salisbury/Wicomico Biking & Hiking Trail Feasibility Study

Wicomico County Maryland

MAP 1
Existing Corridors

Existing Corridors
- Existing Biking/Hiking Trail Corridors
- Scenic Byways

Existing Parks & Schools
- Recreation Areas
- Schools

- Hospital
- Central Planning Area

0 2,200 4,400 Feet

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Potential Trail Routes

On-Road Routes – These are roads that may be well-suited and/or retro-fitted for future bike routes. They include both roads with shoulders and roads without shoulders.

- **Roads With Shoulders** - On roads with shoulders, dedicated bike lanes could be designated.
- **Roads Without Shoulders** - On roads without shoulders, dedicated bike lanes will not be possible and bikers will have to share a travel lane with vehicular traffic.

Off-Road Routes – These are off-road locations where trails could be built to connect to on-road trails or are greenway connections that connect to major hubs.

Rails-to-Trails / Rails-with-Trails Routes – Like the category of Potential Trail Corridors noted directly above, these would be off-road trails. However, they would be different because they involve railroad rights of way. A Rail-with-Trail could be built from Mack Street to Carrol Avenue along the rail right-of-way adjacent to an operating Norfolk Southern line. Another is proposed on former railroad bed that generally parallels Brick Kiln Road between Salisbury and Hebron.

Existing Parks and Schools

County Hub Recreation Areas – These include the following Wicomico County-owned recreation facilities: Naylor Mill Park. Pemberton Park, Winter Place Park, and City Park

Other Parks and Regional Facilities – These include County recreation facilities not noted above plus certain other County properties, such as the Wicomico County Visitors Center and the Ward Museum of Waterfowl Art. In addition, this category includes public parks with service areas smaller than county-level parks.

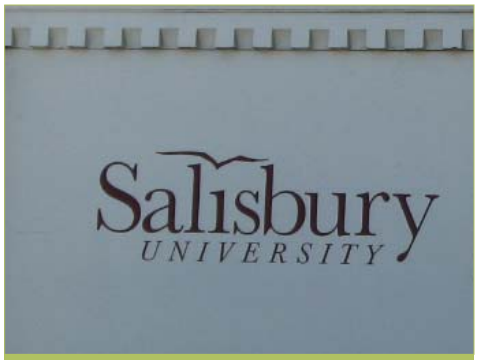
Schools – Includes schools in the S/W MPO serving grades K through 12, the Salisbury University and Wor-Wic Community College.

RECOMMENDED TRAIL ROUTES

Maryland's vision for bicycle and pedestrian mobility is embodied in the State's *20–Year 2002 Bicycle and Pedestrian Access Master Plan*. Mandated by the Bicycle and Pedestrian Access Act of 2001, the plan documents Maryland's long-range vision for bicycle and pedestrian travel throughout the state. The bicycle routes previously identified by bicycling enthusiasts served as a beginning point for more detailed field and aerial mapping reconnaissance. This evaluation builds on the previous system by identifying, where appropriate, alternative routes that may be capable of being developed.

For the purposes of the Concept Plan, the Metropolitan Area has been categorized into the following five sections:

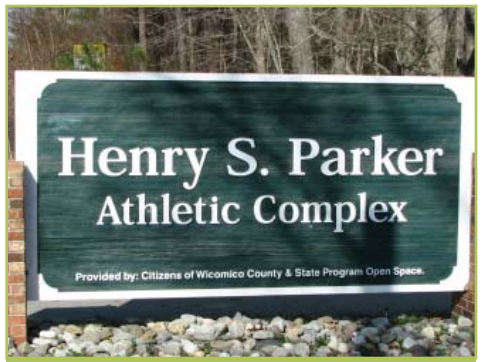
Downtown Section



Southern Section

Eastern Section

Western Section



Northern Section

Downtown Section

The Downtown section of the concept plan depicts the urban core of the Salisbury / Wicomico Metropolitan Area (Map 2). The largest concentration of population within the metro area is located within this area. Linking these residential areas with the integrated parks, schools, hospitals and other community related facilities should be a priority. Existing trails are located in City Park and along portions of Beaglin Park Road and Riverside Drive. Connections from these established trails can be made with the following potential trail corridors:

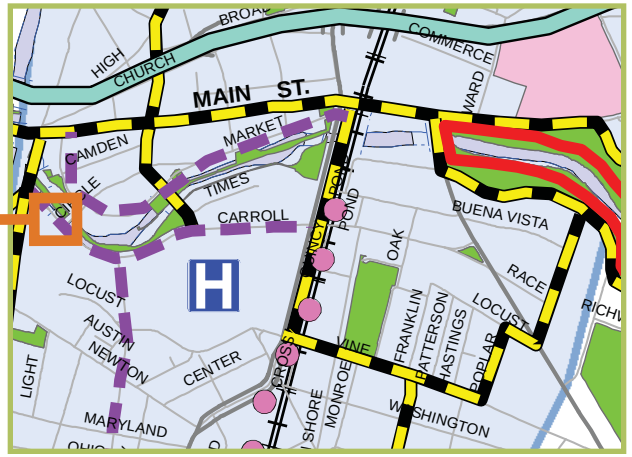
- *Create new, safe intersection crossings across Business Route 13* – Highly visible crosswalks, timed pedestrian signalization and ADA curb cuts should be enhanced for safer and easier pedestrian and bicycle crossings. These intersections include, from north to south: E. Isabella Street, Route 50, Main Street, E. Carrol Street and Vine Street.

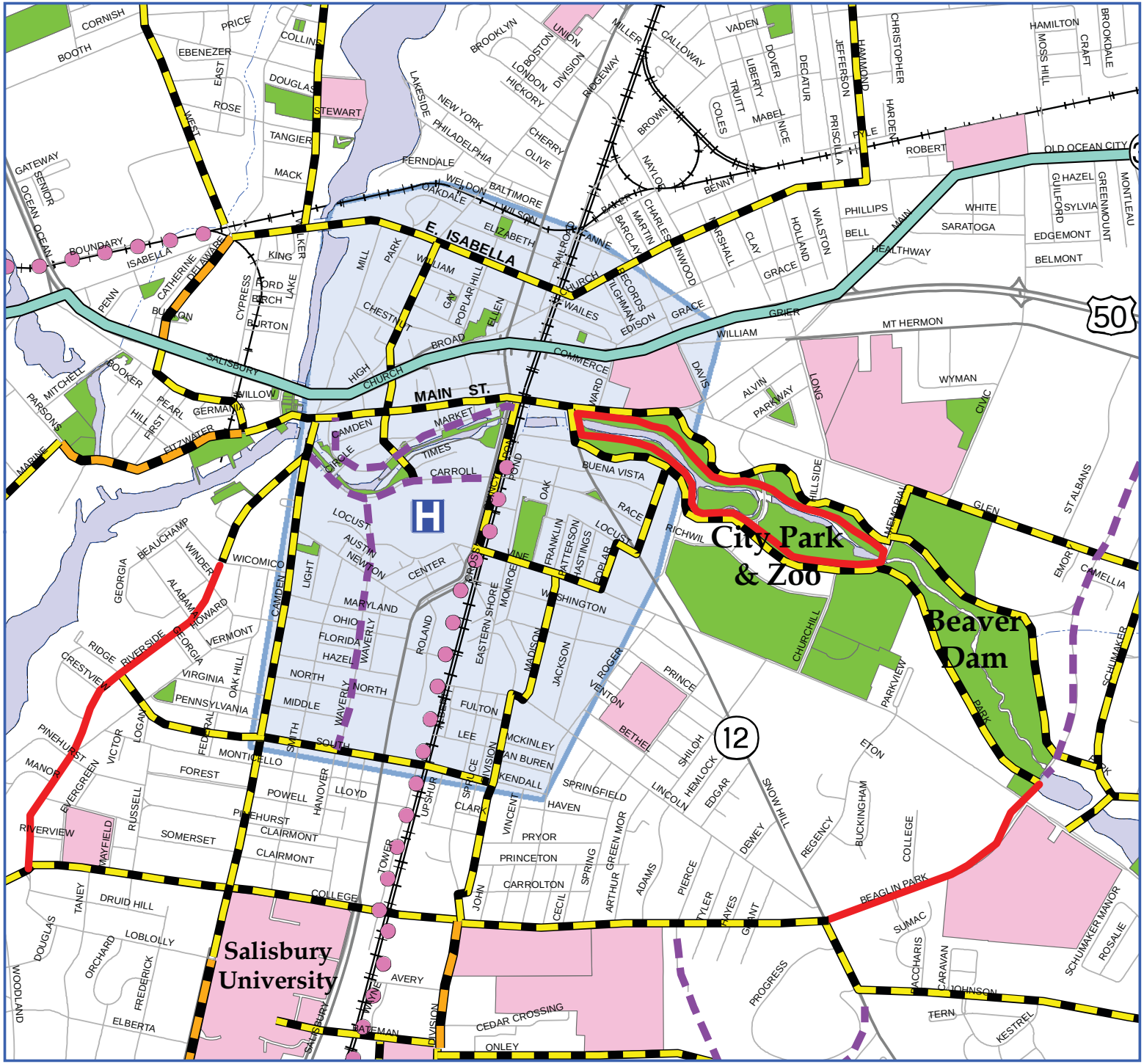
- *Connect Carrol Street to South Boulevard via Waverly Avenue & Camden Avenue* – This corridor already offers bicycle and pedestrian improvements along Salisbury University. Sidewalks are continuous, pedestrian crossings are clearly marked and shoulders are provided for bicycling. North of the campus from South Street and Waverly Street pedestrian enhancements including crosswalks at intersections should be enhanced. Along Carrol Street a continous share-the-road signage and highly visible crosswalks should be implemented.

- *Connect Peninsula Regional Medical Center(PRMC) with commercial and residential areas* – Connecting the PRMC to commercial and residentail areas throughout the area can become an asset to the community. Using new intersection enhancements to cross Business Route 13 (as mentioned above and on page 20), east west connections can be accomplished. These connections can than lead to further reaches in the west, north, south and east, allowing the workers and patrons to use a safe, pedestrian and bicycle route system.

- *Continue the funding and implementation of the Salisbury Urban Greenway* – The Salisbury Urban Greenway will be an inter-connected pedestrian and bike path which will connect downtown to Salisbury University, several public schools, the Ward Museum of Waterfowl Art, City Park and the Wicomico Civic Center.

Shown is a section of the Salisbury Urban Greenway, along Carrol Street, that can become an enhanced multi-use pathway. This pathway is planned to be connected to Downtown Salisbury, Peninsula Regional Medical Center, and City Park & Zoo.





Salisbury/Wicomico Biking & Hiking Trail Feasibility Study

Wicomico County Maryland

MAP 2
Downtown Section

Existing Corridors
- Existing Biking/Hiking Trail Corridors
- Scenic Byways
- Connections to County Bikeways

Potential Trail Corridors

On Road Corridors
- Roads with Shoulders
- Roads without Shoulders

Off Road Corridors
- Off Road
- Rail to Trail Linkages Needed

Existing Parks & Schools
- Recreation Areas
- Schools

- Hospital
- Central Planning Area

0 250 500 Feet

N

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Southern Section

The Southern section of the concept plan (Map 3) focuses on the Salisbury University area which already has a high concentration of pedestrian and bicycle paths. Making pedestrian connections along local routes around the University is critical to ensure safe flow from residential areas to the expanding University footprint. Creating a connection to the downtown to provide opportunities for jobs, shopping and leisure activities will help enhance economic activity in the heart of Salisbury. Linking to other sections of this portion of the concept plan, will create more significant connections to shopping centers, parks, schools and residential areas. Existing trails are located in City Park and along portions of Beaglin Park Road, Ocean Highway and E. Cedar Lane. Connections from these established trails can be connected with the following potential trail corridors:

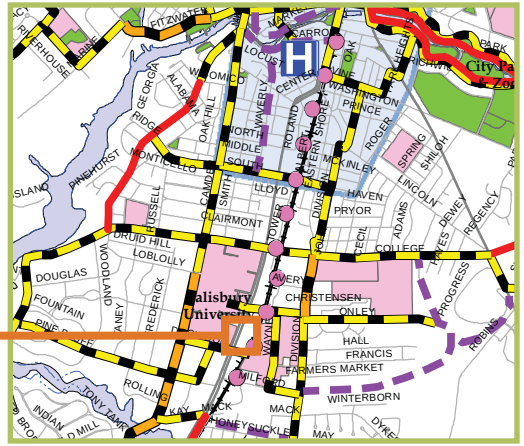
- *Create intersection enhancements at South Boulevard, College Avenue, Dogwood Drive and Cedar Lane along Business Route 13* – Highly visible crosswalks, pedestrian timed crosswalk lighting and ADA curb cuts should be enhanced at each of these intersections for an east-west connection. These intersections have the highest potential to allow for additional pedestrian and bicycle traffic from the western and eastern portions of Salisbury University's expanding campus.

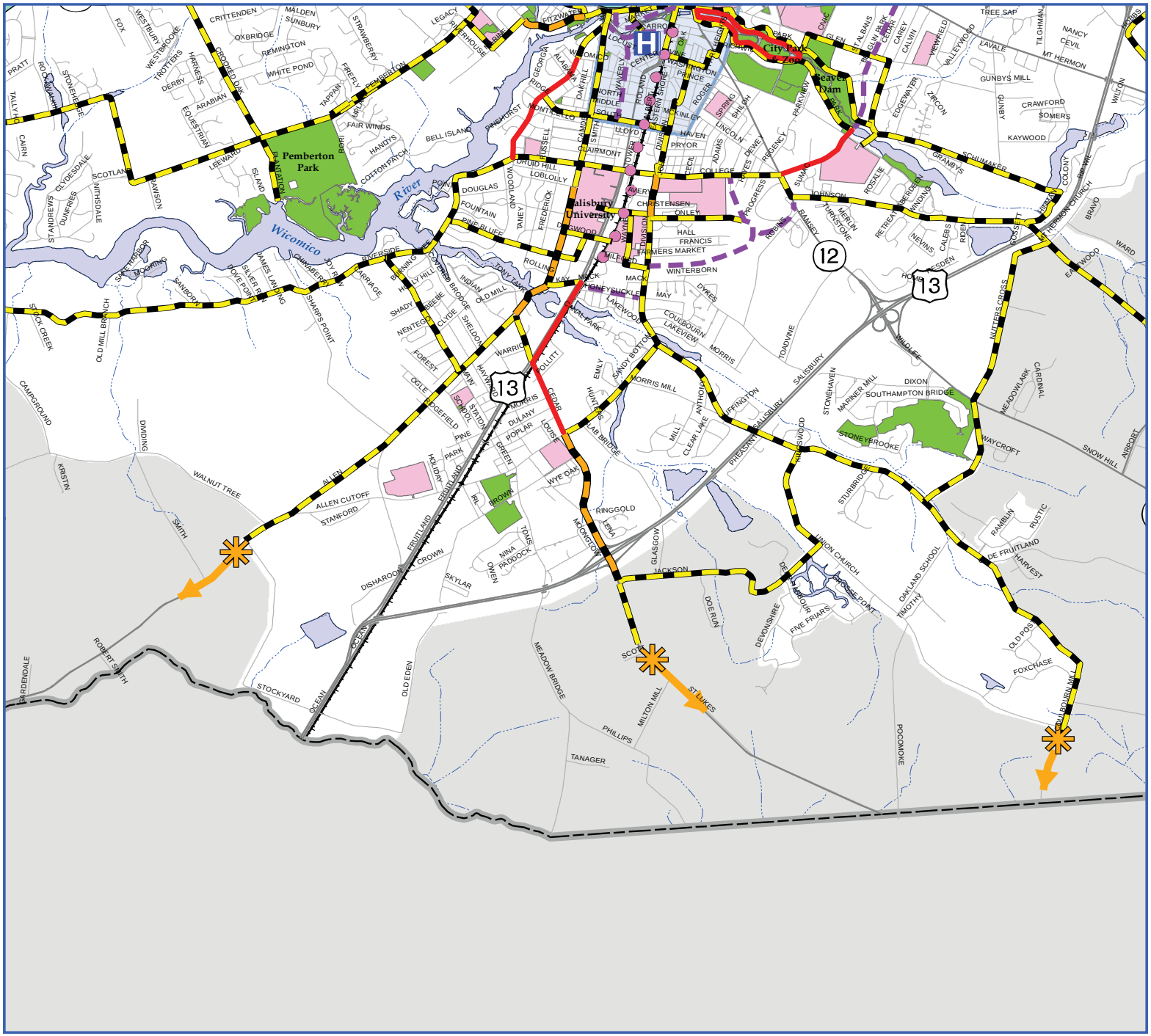
- *Connect Riverside Drive to Division Street & Beaglin Park Drive via College Avenue and South Boulevard* – Sidewalk enhancements and share-the-road signage should be placed along these corridors. W. College Avenue will need parking re-aligned to allow for bicycle traffic. College Avenue, both west and east, can create a major connection by connecting to Riverside Drive in the west and Beaglin Park Drive in the east.

- *Continue off-road trail along E. Cedar Lane from Business Route 13 to Division Street* – Continuing this connection will allow residential properties to the east to connect safely to the shopping center along Business Route 13. Once there, trail users can head north along the established trail along Busienss Route 13 to Salisbury University. Along Division Street, a large north-south connection, creates a loop trail and another possible extension into City Park.

- *Create a Rail-With-Trail connection from Mack Street to W. Carrol Street* – Allow for a fenced, rail-with-trail for safe passage from the eastern campus of Salisbury University, north to City Park and the downtown. This viable route, which is already being used by pedestrians, can include safety features that allow for connections to businesses through the potential rear access points. Negotiations between Norfolk-Southern, Salisbury, Wicomico County, S/W MPO and Salisbury University should allow for a safe and successfull Rail-With-Trail connection.

A high-priority trailway should be planned to construct a Rail-with-Trail along the existing railway between Canal Park Drive north to Carrol Street. This off-road, multi-use trailway can create a safe connection from Salisbury University to Downtown Salisbury.





Salisbury/Wicomico Biking & Hiking Trail Feasibility Study

Wicomico County Maryland

MAP 3
Southern Section

Existing Corridors
- Existing Biking/Hiking Trail Corridors
- Scenic Byways
- Connections to County Bikeways

Potential Trail Corridors

On Road Corridors
- Roads with Shoulders
- Roads without Shoulders

Off Road Corridors
- Off Road

- Rail to Trail Linkages Needed

Existing Parks & Schools
- Recreation Areas
- Schools

- Hospital
- Central Planning Area

Feet
0 750 1,500

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Eastern Section

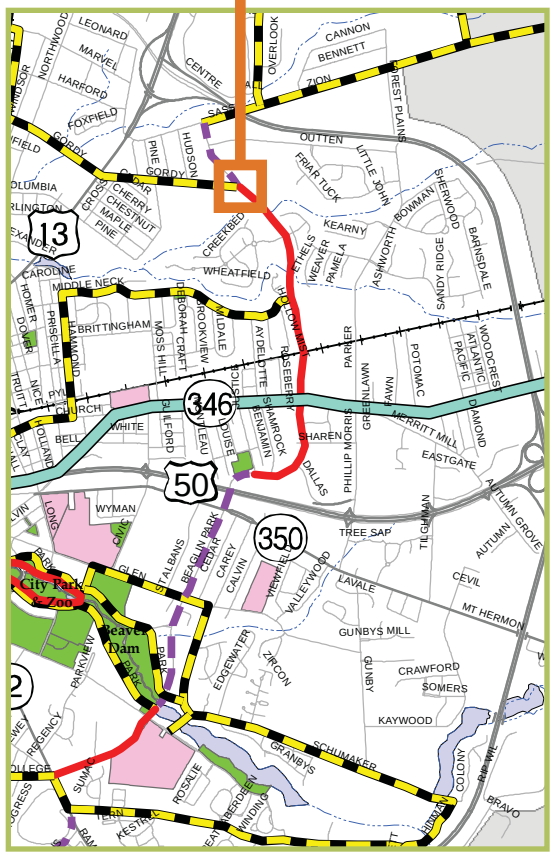
In the Eastern Section of the MPO, Winter Place Park, a 377-acre park located between Old Ocean City, Walston Switchback Road and Rt. 50 - Ocean Gateway, is the hub for the Eastern section of the concept plan (Map 4). Mostly remote and divided off from the urbanized core, Winter Place Park is an essential hub to connect the rural lands of Wicomico County with the City of Salisbury and surrounding suburban areas. Route 50, a mjaor east-west highway constricts easy access from north to south. Existing trails are located in Winter Place Park and a portion of Beaglin Park Road. Connections from these established trails can be made with the following potential trail corridors:

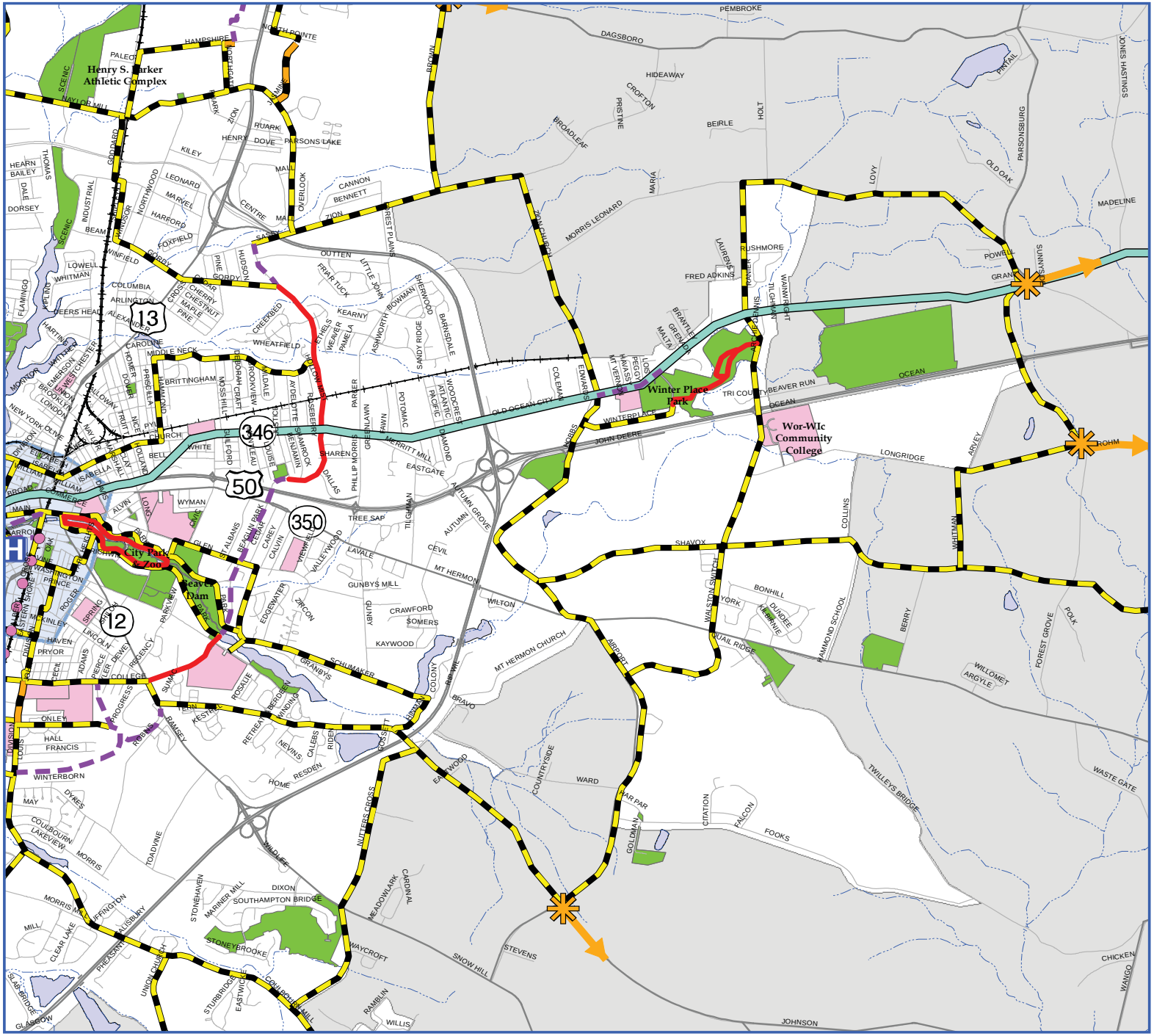
- *Continue construction of Beaglin Park Drive trail corridor* – This corridor is one of the most feasible and instrumental linkages in the Eastern section. Creating a trail from just south of the mall along Route 13 in the north, south to Snowhill Lane allows for connections to parks, schools, residential areas. This entire system can be created off-road, enhancing safety and creating an enjoyable trail experience.

- *Create connections from Winter Place Park* – Winter Place Park has an extensive trail system already in place. Connections to Walston Switch Road and Old Hobbs Road can direct trail users to other regional trails while creating a central location for parking.

- *Create connections to-and-from the Salisbury Mall area via Beaglin Park Drive* – With residentail areas to the south of the mall area, pedestrian and bicycle traffic should be studied to be connected. Beaglin Park Drive can connect many residential neighborhoods across to the area. Route 50 is a major constriction but is currently under study for intersection enhancements, while a future extension of Beaglin Park Drive into the mall area will need to be completed from Gordy Road.

- *Create connections from Wor-Wic Community College & Winter Place Park to the Salisbury Mall area* – Northwest of Wor-Wic Community College is the Shore Transit Multi-modal station. This station allows for service throughout the Metropolitan Area. Pedestrian and bicycle users can head north along Walston Switch Road to Winter Place Park. From the park, a new off-road connection along Route 346 to Zion Church Road should be established. An on road route along Zion Church Road to Zion Road (east) will allow users to travel to the Salisbury Mall area.





Salisbury/Wicomico Biking & Hiking Trail Feasibility Study

Wicomico County Maryland

MAP 4
Eastern Section

Existing Corridors
- Existing Biking/Hiking Trail Corridors
- Scenic Byways
- Connections to County Bikeways

Potential Trail Corridors

On Road Corridors
- Roads with Shoulders
- Roads without Shoulders

Off Road Corridors
- Off Road
- Rail to Trail Linkages Needed

Existing Parks & Schools
- Recreation Areas
- Schools

- Hospital
- Central Planning Area

0 750 1,500 Feet

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Northern Section

The centralized hub for the Northern section of the concept plan revolves around Naylor Mill Park (Map 5). The park includes the 40-acre Henry S. Parker Athletic Complex and 120 acres of passive recreation land. Within the passive recreation areas, trail development and use is continuously increasing for bicycling and hiking. The park holds many special events throughout the year, especially within the softball community. Tournaments bring in large number of people to the area and suggest opportunities for a trail system that can safely connect to other attractions in the metropolitan area.

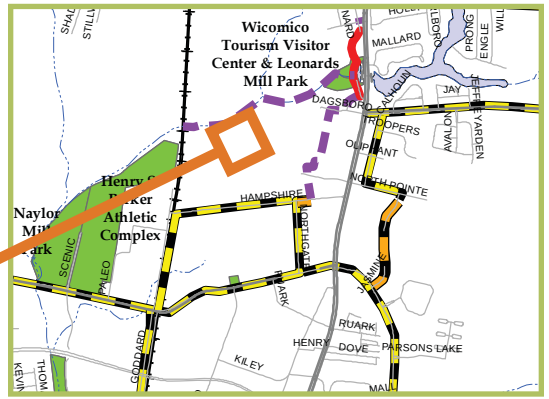
Existing trails are located in Naylor Mill Park, at the Wicomico Tourism Visitor Center & Leonards Mill Park and along Route 54 (the Maryland and Delaware boundary). Connections from these established trails can be connected with the following potential trail corridors:

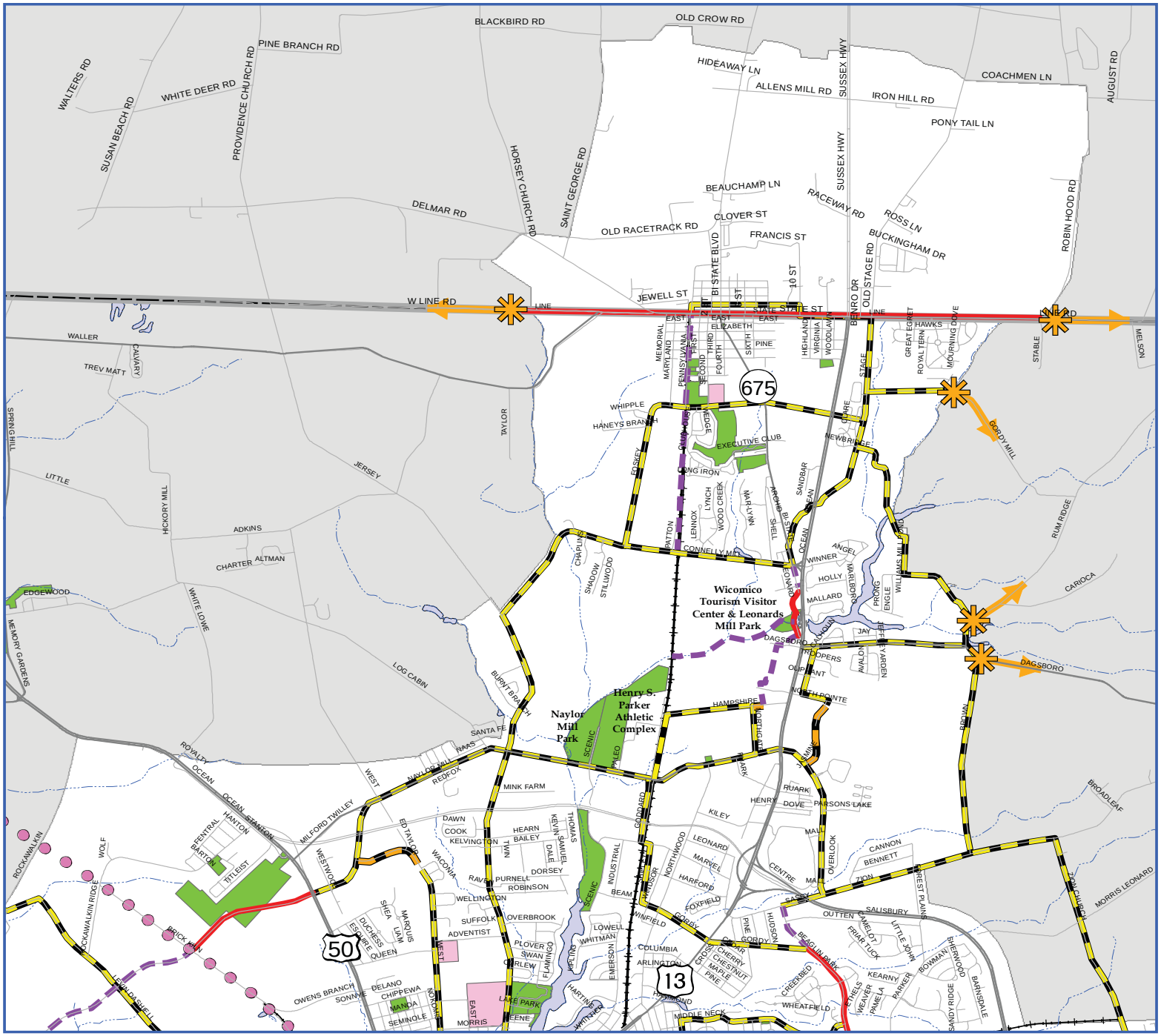
- *Create an off-road trail from downtown Delmar to Connelly Mill Road* – Heading north from Connelly Mill Road to S. Pennsylvania Avenue the route of an off-road trail corridor would have to be agreed upon with certain private landowners. From Foskey Lane northward along S. Pennsylvania Avenue an off-road trail could be constructed in the right-of-way next to the railroad.

- *Create a greenway trail from Naylor Mill Park to Wicomico Tourism Visitor Center & Leonards Mill Park* – The possibility of securing a pedestrian easement should be discussed with local landowners along the creek that connects both parks. Creating a creekside trail will deter private development along important streams, conserve the natural setting along the stream and protect water quality.

- *Continue large commercial development to include inner-circulation and connectivity between Naylor Mill Road & Dagsboro Road* – Using inner roads and not the busy Route 13 corridor, bicyclists and pedestrians can travel to more than one place without driving to each commercial location. Also, these inner roads have lower-speed traffic and fire lanes where parking is not allowed, which are excellent for bicycle riding.

The S/W MPO should work and cooperate with local landowners to create connections through privately-owned land. Creating greenways along waterways helps preserve natural land while allowing residents and toursits to see Wicomicos natural areas. In this section a connection from the Wicomico Tourism Visitors Center to Naylor Mill Park should be created along Naylors Run.





Salisbury/Wicomico Biking & Hiking Trail Feasibility Study

Wicomico County Maryland

MAP 5
Northern Section

Existing Corridors
- Existing Biking/Hiking Trail Corridors
- Scenic Byways
- Connections to County Bikeways

Potential Trail Corridors

On Road Corridors
- Roads with Shoulders
- Roads without Shoulders

Off Road Corridors
- Off Road

Rail to Trail Linkages Needed

Existing Parks & Schools
- Recreation Areas
- Schools

Hospital

Central Planning Area

Feet
0 750 1,500

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Western Section

Pemberton Park is a historic park set on 262 acres and 4.5 miles of trails which is the Western section's hub (Map 6). Nanticoke Road (Route 349), also known as the Blue Crab Scenic Highway, is the main east-west connection within this area and already is used for bicycling purposes because of its wide shoulders. Existing trails are located in Pemberton Park, a portion of Naylor Mill Road and Upper Ferry Road. Connections from these established trails can be made with the following potential trail corridors:

- *Continue constructing Naylor Mill Road with an off-road trail* – A four-phased project to extend Naylor Mill Road to U.S. Route 50 Business to Crooked Oak Lane. Additional improvements are programmed along Crooked Oak Lane from the extension of Naylor Mill Road to its intersect with MD 349. Each of the phases include a planned bike trail. From U.S. Route 50 Business to Brick Kiln Road is the only portion open-to-date.

- *Connect City Park to the Blue Crab Scenic Route* – Use Fitzwater Street west to Marine Street, heading north on Ellegood and Culver Streets.

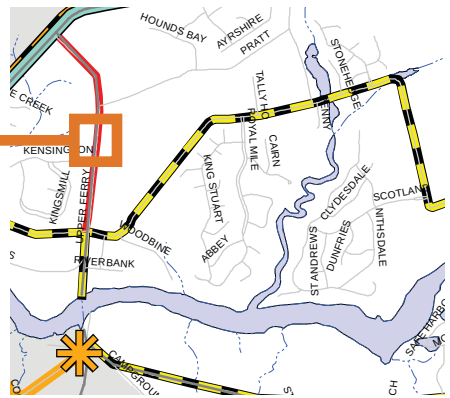
- *Create a safe bicycle route along Nanticoke Road (Route 349)* – Wide shoulders already exist. The placement of signage along the roadway should be sufficient to inform motorists of this on-road bicycle route.

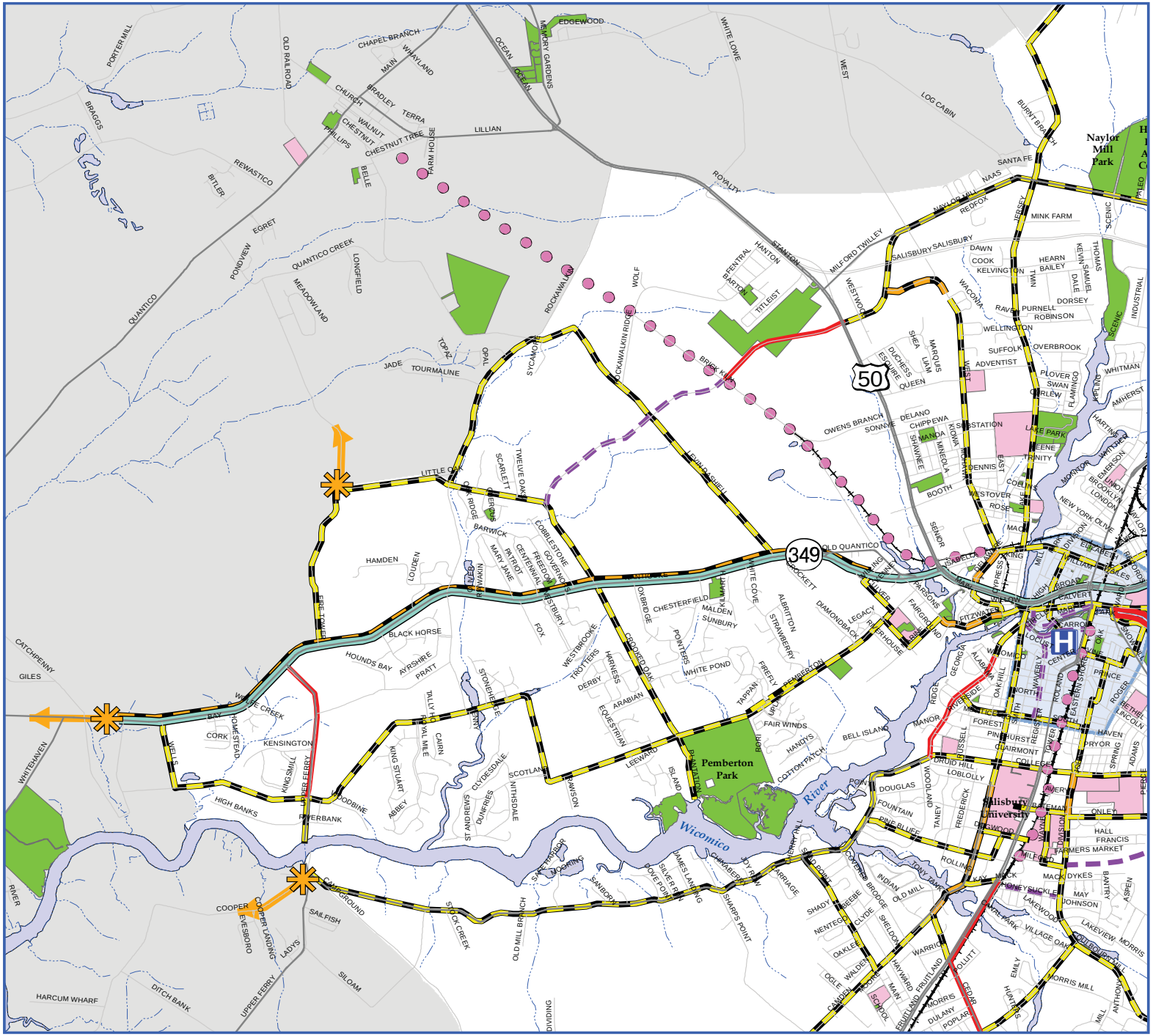
- *Enhance connections to Pemberton Park* – Create a safe trail corridor along Pemberton Road and Crooked Lane Road to connect the residential community to this historic park. Along both roadways the shoulders are very minimal. These roadways do have room for an off-road trail to be constructed. An off-road trail may be feasible, especially if development continues in this area.

- *Create a Rail-to-Trail connection from downtown to the rural northwest* – An abandoned railway exists slightly north of the Route 50 / Nanticoke Road intersection, and runs northwest towards Route 347. Making this abandoned railway a multi-purpose trail corridor will connect the Western section's rural communities and Hebron to the downtown.

- *Create an Upper Ferry Loop Route* – Creating a multi-modal (pedestrian/bicycle/ferry) loop would be a unique route for any trail user. Creating safe connections from the west along Upper Ferry Road and from the south along Riverside Drive, users could create loop from downtown to many destinations throughout the County.

Many of the roadways in the western portion are rural, flat roads with wide shoulders. These types of roadways are premier for on-road bicylcing. Although, this area already has a network of these types of roadways, no signage is evident to allow motorists that these roadways are also bikeways. Upper Ferry Road from Nanticoke road to Pemberton Drive is the only roadway with bike signage.





Salisbury/Wicomico Biking & Hiking Trail Feasibility Study

Wicomico County Maryland

MAP 6
Western Section

Existing Corridors
- Existing Biking/Hiking Trail Corridors
- Scenic Byways
- Connections to County Bikeways

Potential Trail Corridors

On Road Corridors
- Roads with Shoulders
- Roads without Shoulders

Off Road Corridors
- Off Road
- Rail to Trail Linkages Needed

Existing Parks & Schools
- Recreation Areas
- Schools

- Hospital
- Central Planning Area

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CHAPTER 4 - DESIGN & DEVELOPMENT GUIDELINES

This chapter provides guidelines on how to develop various types of trails within the Salisbury / Wicomico Metropolitan Area. The guidelines noted herein are based on the best practices in use throughout the United States, including professionally-accepted national standards for bicycle facilities.

TYPES OF TRAILS

Brief descriptions for each are provided below. For more information regarding design and construction, see Chapter 4 - Biking and Hiking Trail Design and Development Guidelines. The types of trails that make up the "spokes" of this trail network are divided into the following three categories.

Off-Road Trails - An off-road trail can refer to a ten-foot wide, paved multi-use trail or sidewalks in residential and downtown settings. Amentities, such as benches, lighting, trees, trash/ recycling receptacles are normally found along these routes. This type of trail is recommended for areas of heavy use, usually connecting high density areas.

On-Road Trails - Street based trails are improvements to bicycle-and-pedestrian friendly streets. They are designed to provide safe, non-motorized access between parks, trails, neighborhoods, and other destinations. For the Salisbury Metropolitan area, street-based trails will typically feature sidewalks, high visibility crosswalks, curb ramps, and pedestrian crossing signals at intersections with traffic signals. A variety of bicycle facilities are recommended depending on the location of the street-based trail. Shared-lane markings (sharrows), wide outside lanes, paved shoulders, and bicycle lanes are examples of bicycle safety improvements. These improvements should all be implemented in compliance with Maryland Department of Transportation regulations.

Rails-to-Trails - Rails-to-Trails and Rails-with-Trails are trail routes that use existing or abandoned railways. A national concept for trail development, this technique is contingent on the sale and/or cooperation from the owner of the right-of-way. The most common Rails-to-Trail is a conversion from an abandoned rail bed into a multi-use pathway. Rails-With-Trails are used in conjuction with active railways, which need fencing and safety controls.

DESIGN PRINCIPLES

Trails proposed in Salisbury / Wicomico Biking and Hiking Trail Feasibility Study, depending on the location, may vary from primitive earthen tracks to paved, graded pathways. Some trails already exist in the form of bicycle lanes, bicycle routes, and sidewalks. Trail users may vary from hikers, equestrians, bicyclists and/or in-line skaters. When designing a trail; the layout, surface, road crossings, signs, landscaping, and other infrastructure are all important considerations. Information in this section is not a substitute for professional, site-specific planning and design work. Before implementation of a specific trail improvement, each trail should be studied in light of the desired trail characteristics and the appropriate design development standards applied.

Trail Layout

Trail layout should be sensitive to the environment the greenway intends to preserve. The trail should be compatible with the natural landscape and follow elevation contours where possible. If the trail cannot accommodate the intended user groups without having a negative impact on surroundings, the location and design of the trail should be re-evaluated. The trail should also be routed to increase environmental awareness, and be built and maintained in a sustainable, cost-effective, and timely fashion. Improper trail implementation can lead to long-term maintenance problems, which are often difficult to fix. Trail tread/width recommendations have been developed for bicycle trails in urban, suburban and rural settings. Furthermore, the American Association of State Highway Transportation Officials (AASHTO) provides recommendations for trail widths.

Trails should also be comply with design criteria established by the Americans with Disabilities Act (ADA). At this time, trails must meet the following technical provisions in order to be considered accessible:

- Surface - the trail surface shall be firm, stable and slip resistant
- Clear Tread Width - 36" minimum
- Tread Obstacles - 2" high maximum (up to 3" high where running and cross slopes are 5% or less)
- Cross Slope - 5% maximum
- Passing Space - provided at least every 1,000' where the trail width is less than 60" (5'-0")
- Signs - shall be provided indicating the length of accessible trail segment
- Running Slope (trail grade) shall meet one or more of the following:
    - 5% or less for any distance
    - Up to 8.33% for 200' maximum with resting intervals no more than 200' apart
    - Up to 10% for 30' maximum with resting intervals no more than 30' apart
    - Up to 12.5% for 10' maximum with resting intervals no more than 10' apart.
    - No more than 30% of the total trail length may exceed a running slope of 8.33%

In certain environments, certain user groups, such as cyclists and equestrians, may require some restrictions to minimize environmental impacts. Trail design details may also be warranted to reduce the impacts caused by specific site characteristics. Boardwalks near wetlands are one example of a restrictive trail option that attempts to minimize environmental impacts.

Trail Construction

A highly-developed trail is made of three components: the sub-grade, the sub-base and the trail surface. The sub-grade is the trail's foundation, which is made up of the native soils that bear the load generated by trail users. The sub-base distributes the weight of the trail surface and users to the sub-grade. The trail surface is the point of contact between the trail and the users. The surface can be either soft or hard, depending on the need to absorb or repel water.

AASHTO STANDARD TREAD WIDTH FOR BICYCLE-ONLY TRAILS	
AASHTO Standards	*Recommended Minimum Width*
One way, single lane	5'
Two way, dual lanes	10'
Three lanes of bicycle travel	12.5' minimum

RECOMMENDED TRAIL TREAD WIDTHS FOR USER-SPECIFIC TRAILS	
Trail User Type	*Recommended Tread Width*
Bicyclist	10' (2-way travel)
Hiker / walker / jogger / runner	4' rural; 5' urban
Cross-country skier	8-10 ' for 2-track trail
Equestrian	4' tread; 8' cleared

MINIMUM RECOMMENDED TREAD WIDTHS FOR MULTIPLE-USE TRAILS			
Tread Type	*Urban*	*Suburban*	*Rural*
Pedestrian, non motorized	12'	10'	10'
Pedestrian, equestrian	16'	12'	10'
Source: AASHTO			

BIKEWAYS

Bicyclists have a range of skill levels, from Type "C"/beginners (especially children and seniors), to Type "B"/intermediate (occasional commuters and recreational cyclists), to Type "A"/experienced (regular commuters and recreational cyclists, including any adults comfortable sharing the road with motor vehicles). Design guidelines are inteded to be flexible and can be applied with professional judgement by designers and engineers. Specific national and state guidelines are identified in this document, as well as design treatments that may require formal applications to MDOT and FHWA for approval.

ON-ROAD TRAILS

Bicycles are legally classified as vehicles and may be ridden on most public roads, except where specifically excluded. Bicycles are typically prohibited on sidewalks that are for the use of pedestrians. An on-road bikeway is created when a road has the appropriate design treatment to accommodate bicyclists, based on motor vehicle traffic volumes and speed. The following are examples of On-Road Bikeways.

Striped/Paved Shoulder - Paved shoulders are part of a roadway which is contiguous and on the same level as the regularly traveled portion of the roadway. A minimum width of at least four feet is recommended. Ideally, paved shoulders should be included in the construction of new roadways and/or the upgrade of existing roadways, especially where there is a need to more safely accomodate bicycles. Recommended characteristics of striped/paved shoulder on-road bikeways:

- Most often used in rural environments, although not confined to any particular setting
- Should be delineated by a solid white lines, and provided on both sides of the road
- Should be contiguous and on the same level as the regularly traveled protion of the roadway
- 4' minimum width, however for speeds higher than 40 MPH with high ADT, a shoulder width of more than 4' is recommended
- Rumble strips should be avoided, but if used, then a width of more than 4' is needed
- Paved shoulders should not be so wide as to be confused with a full automobile lane

Figure 1

Wide Outside Lane - Where bike lanes are warranted but cannot be provided due to severe physical constraints, a wide outside lane may be provided to accommodate bicycle travel. A wide lanes usually allows an average size motor vehicle to pass a bicyclist without crossing over into the adjacent lane.

Figure 2

Conventional Bicycle Lanes - A bicycle lane is a portion of the roadway that has been designated by striping, signing, and pavement markings for the preferential and exclusive use of bicylclists. Bicylce lanes are located on both sides of the road, except one way streets, and carry bicyclists in the same direction as adjacent motor vehicle traffic.

Recommended conventional bicycle lane features:

- 6' from the curb face (no less than 4' from curb face)
- 14.5' from the curb face when along streets with parking
- Should be used on roadways with 3,000 or more ADT
- Not suitable where there are a high number of commercial driveways
- Suitable for 2-lane facilities and 4-lane divided facilities.

Figure 3

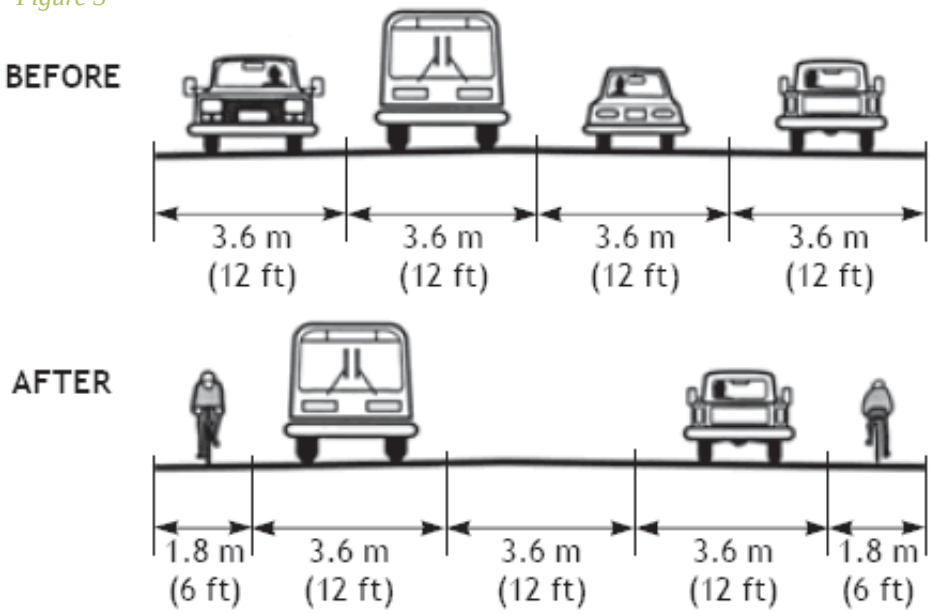
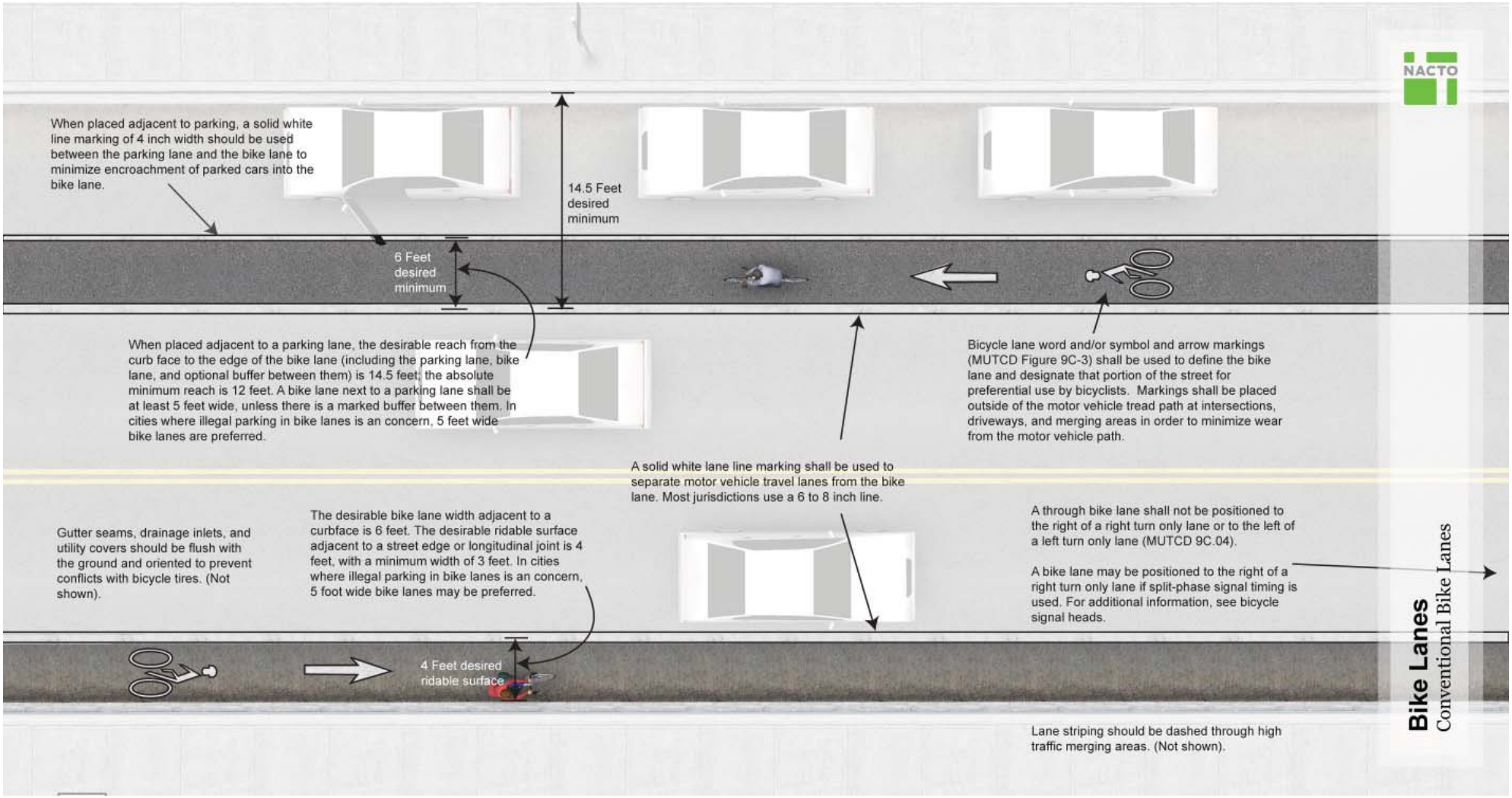


Figure 4

Design Guidance

Figure 5



Buffered Bicycle Lanes - Buffered Bike Lanes typically have a desired width of 6' feet and minimum of 5' feet against a curb with white paint lines and bicycle symbols painted on the bikeway. The minimum should be not less than 4' to 5' feet in width if there is no curb. These lanes are desired where there is heavier traffic and where the road and/or street has the following characteristics:

- Where the average daily traffic vehicles of 3,000 or greater
- Where there is existing truck traffic
- On streets with multiple lanes
- Where allowed speeds are greater than 35 mph.
- A diagonal white striped buffer with a desired 3' width, minimum of 2'feet in width that separates the moving traffic lane from the bike lane
- A bikeway lane having a minimum of 4' while 5' is desired if no parking is allowed.
- When along streets with parking they should begin a desired 14.5' feet from the curb to allow the 6' width and prevent conflicts with car door openings.

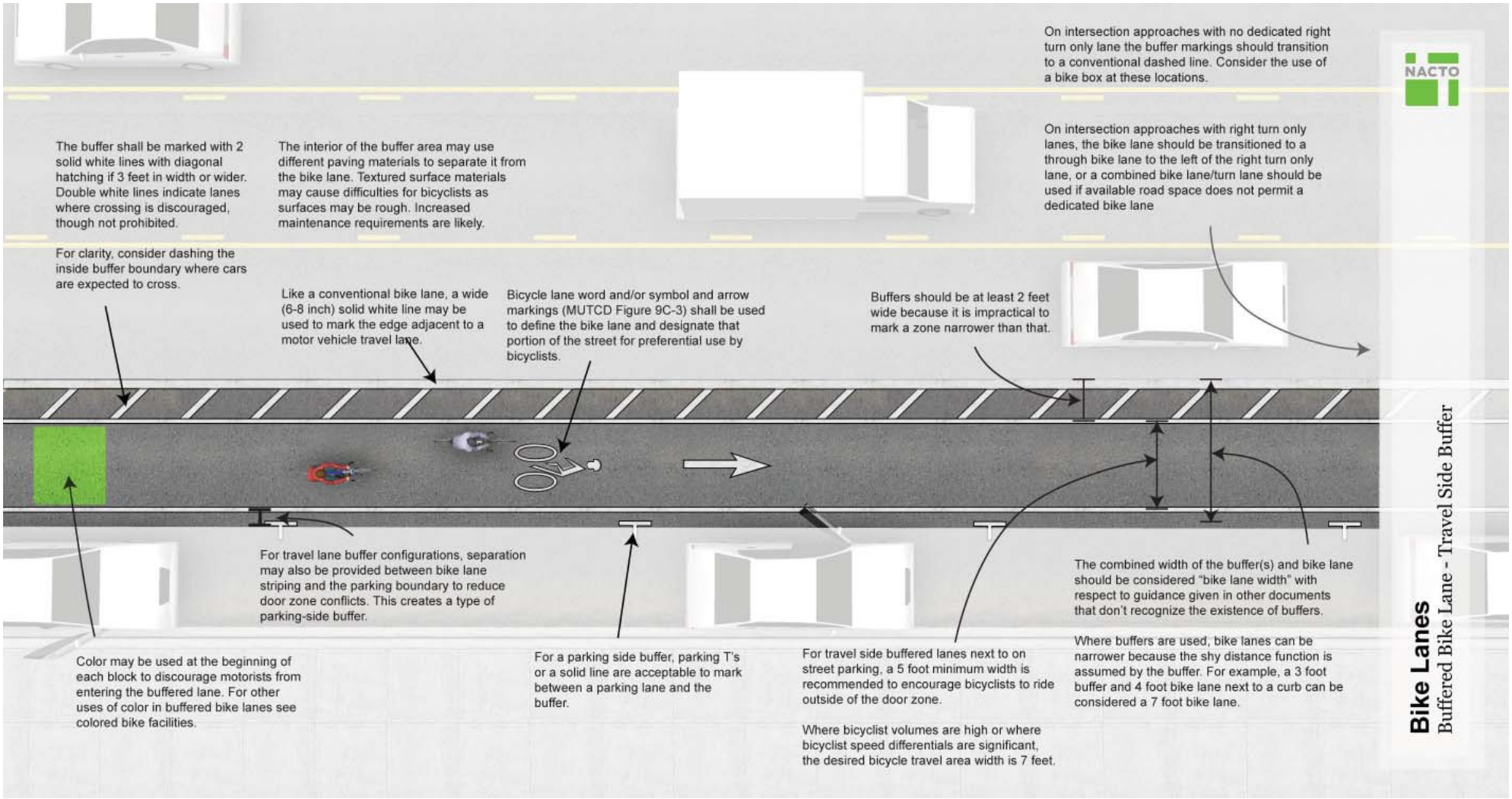
Figure 6

Figure 7

Figure 8

Design Guidance

Figure 9



Contra-flow Bicycle Lanes - The contra-flow bicycle lane provides a striped lane going against the flow of automobile travel. The lanes should be seperated by a double yellow line.

Potential applications could include:

- Provide direct access to key destination
- Infrequent driveways on bike lane side
- Bicyclists can safely and conevniently re-enter traffic at either end
- Sufficient width to provide bike lane
- No parking on side of street with bike lane

Figure 10

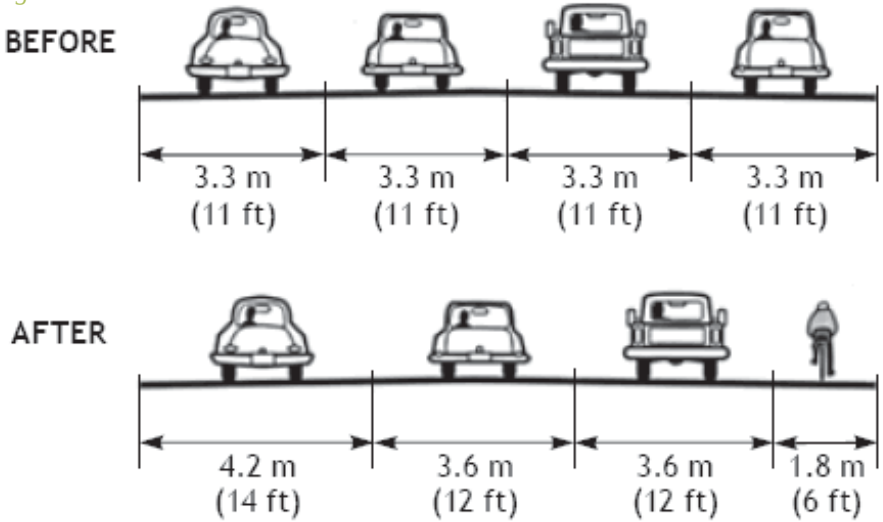
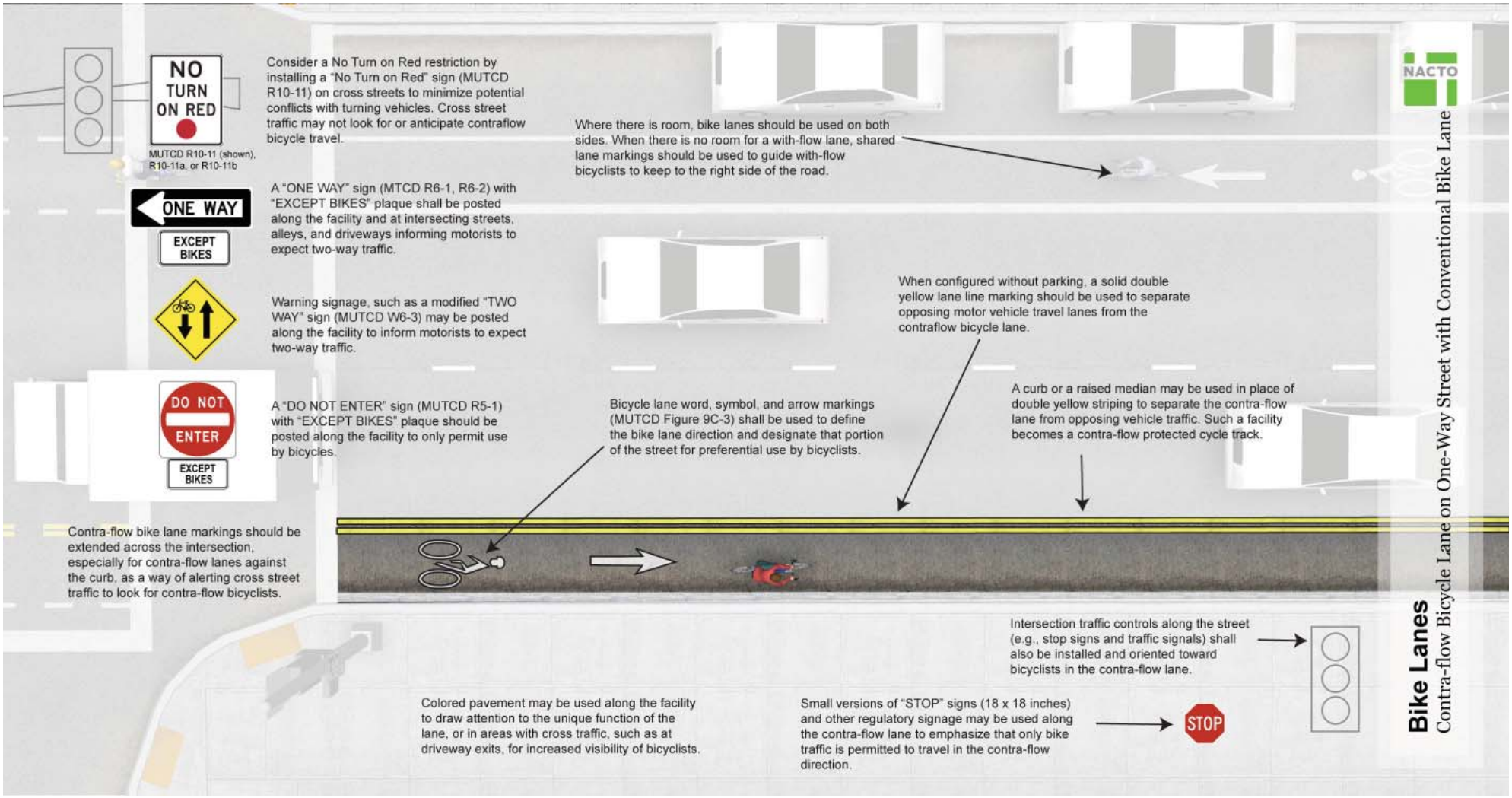


Figure 11

Figure 12

Design Guidance

Figure 13



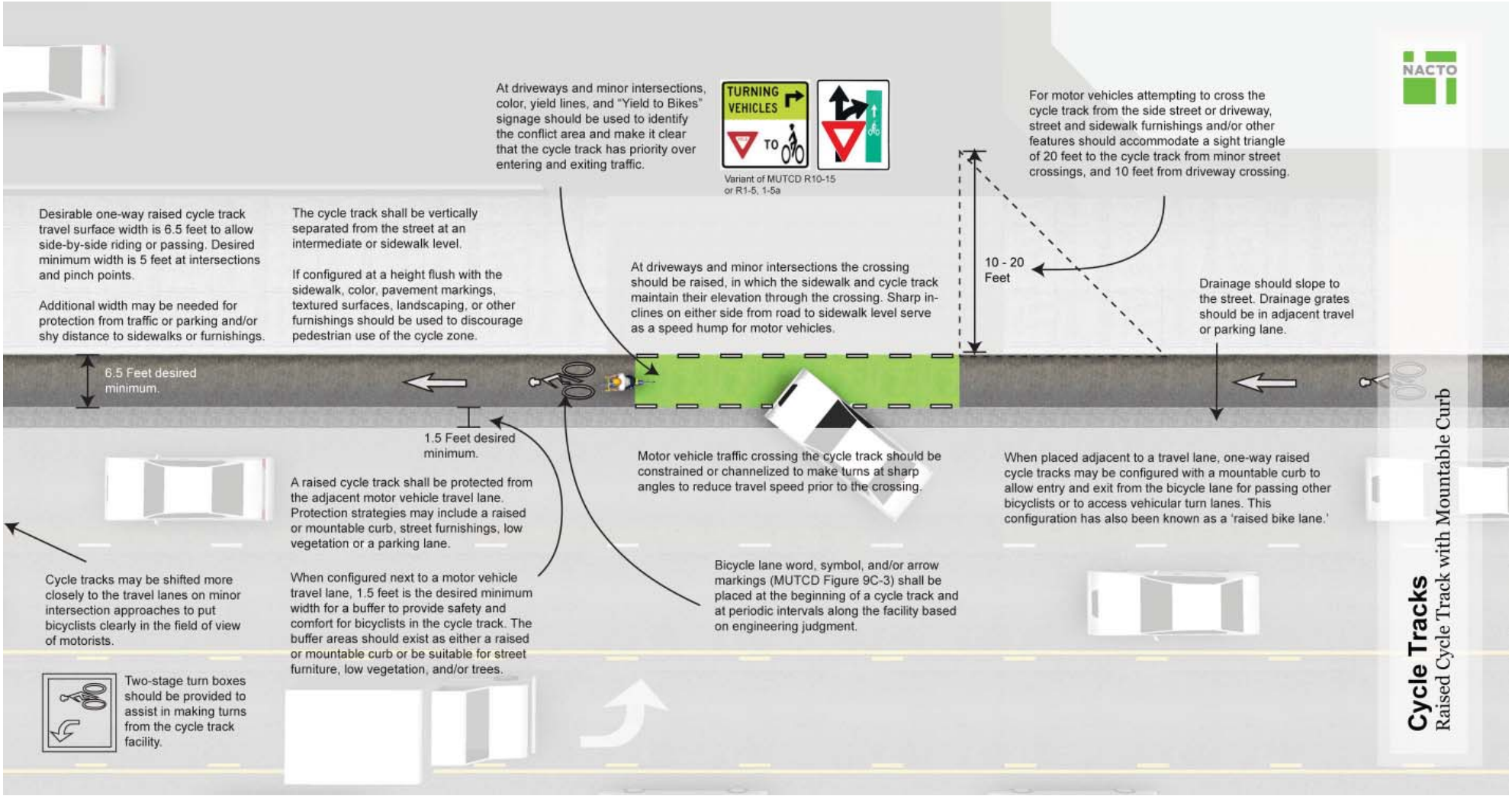
Cycle Tracks - Cycle tracks are seperated from travel lanes and pedestrians by a physical barrier, such as on-street parking or a curb, or are grade-seperated. Properly designed cycle tracks eliminate conflicts between bicycles and parking cars by placing the cycle track on the inside of the parking lane. Cycle tracks are particularly apparopriate on roads that have fewer cross-streets and longer blocks, which often allow higher vehicle speeds. Visual and physical identification should be highly visible, especially at openings in the barrier or curb necessary for driveway and minor street access. Cycle tracks can provide for either one- or two-way traffic depending on the road conditions.

Figure 14

Cycle track in Cambridge, MA

Design Guidance

Figure 15



Painted or Surface Colored Bicycle Lanes - In additon to markings presented in the MUTCD, the following pavement markings may be considered. Other cities and countries have used colored pavement for bicycle lanes in areas that tend to have a higher likelihood for vehichle conflicts. Examples of such locations are freeway on-and-off ramps and where a motorist may cross a bicycle lane to move into a right turn pocket. Studies after implementation showed more motorists slowing or stopping at colored lanes and more motorists using thier turning signals near colored lanes. Green is the recommended color (some cities that have used blue are changing to green, since blue is associated with handicapped facilities).

Figure 16

Bicycle Boulevards - Bicycle boulevards modify the operation of a local street to function as a through street for bicycles while maintaining local access for automobiles. Traffic calming devices control traffic speeds and discourage through trips by automobiles. Traffic controls limit conflicts between automobiles and bicycles and give priority to through bicycle movement. For a complete overview, see www.ibpi.usp.pdx.edu/guidebook.php

The primary characteristics of a bicycle boulevard are:

- low motor vehicle volumes
- low motor vechile speeds
- continuous routes that are well marked and signed
- provide convenient access to desired destinations
- minimal bicyclist delay
- safe crossings for cyclists at intersections

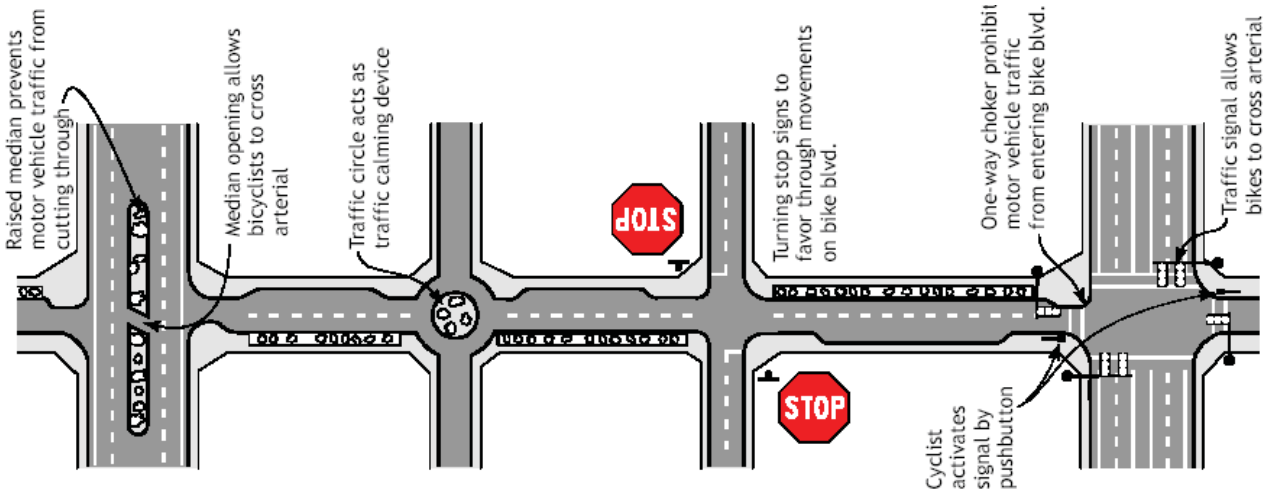
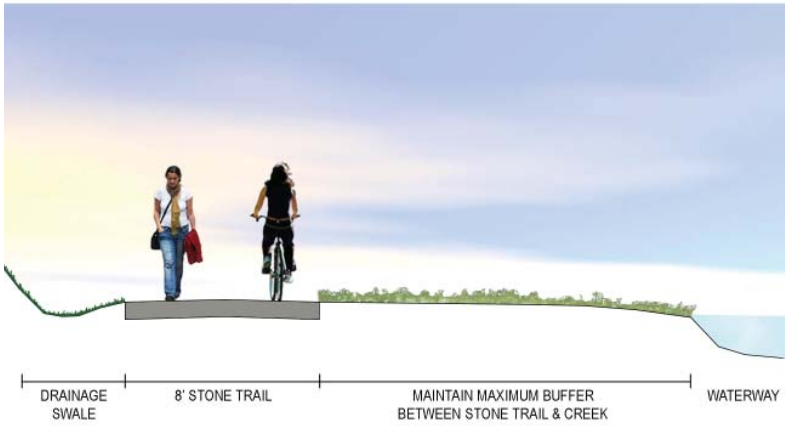


Figure 17

OFF-ROAD TRAILS

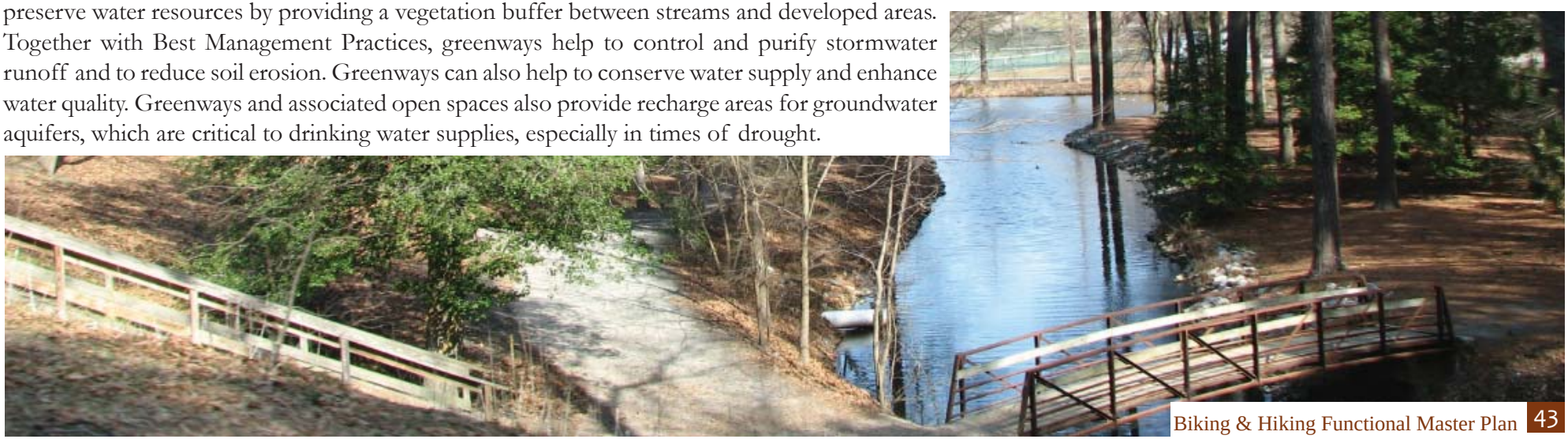
Off-road trails offer a trail experience to a variety of users, such as walkers, runners, bikers, rollerbladers and hikers. These trails consist of downtown sidewalk connections, multi-use trails which connection neighorhoods, and greenways which follow waterways. Trail amentities such as benches, pedestrian-level lighting, trash/recycling receptacles, kiosks, trees and landscaping, add to the over positive experience through these routes. Due to the lack of use by motorized vehicles, off-road trails are safer for all users. The following are examples of Off-Road trails.

Greenways - Greenwys are linear corridors of preserved public and private area and can be either land- or water-based. Greenways serve a variety of functions and benefits, such as recreation, transportation, community revitalization and economic development, natural resource conservation, environmental protection, wildlife habitat and migration, and education. Greenway corridors often follow old railways, canals, ridge tops, rivers, and stream valleys.



The environmental, health, recreational, biodiversity, and other benefits of greenways increase the quality of life in community. Virtually every greenway can provide some measure of benefit to the community, and most greenways provide several such measures. Public-access greenways can be a tourist attraction that draws visitors from a wide area, depending on the type of greenway and the extent of recreational amenities, such as fish and boat access points, trails, scenic roadway designations, or cultural/historic markers within urban greenways.

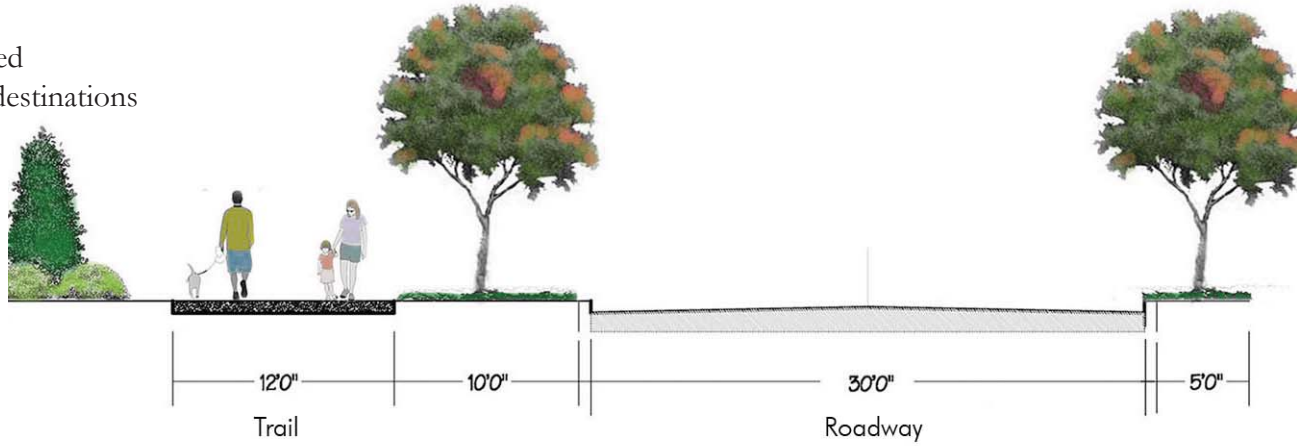
Many greenways are located adjacent to waterways and provide natural areas for overflow in times of flooding, which helps to minimize flood damage. Greenways are one tool that developers and local officials can use to reduce the potential for future flood damage. Greenways also help to preserve water resources by providing a vegetation buffer between streams and developed areas. Together with Best Management Practices, greenways help to control and purify stormwater runoff and to reduce soil erosion. Greenways can also help to conserve water supply and enhance water quality. Greenways and associated open spaces also provide recharge areas for groundwater aquifers, which are critical to drinking water supplies, especially in times of drought.



Multi-Use Pathways - Multi-use pathways are normally a 10-foot wide, paved pathway. The trail typically will have trees, landscaping and connect users from high-density to low-density areas. Many of these types of pathways are located within residential neighborhoods, connecting residents to parks, commercial areas, and other destinations.

The primary characteristics of a multi-use pathway are:

- paved 10' pathway (can also be constructed with a solid base of gravel fines)
- flat terrain / slope
- continuous routes that are well marked and signed
- provide convenient access to-and-from desired destinations
- accomodates all types of trail users
- safe crossings for users at intersections



Cobbs Creek Connector Trail
Philadelphia, PA

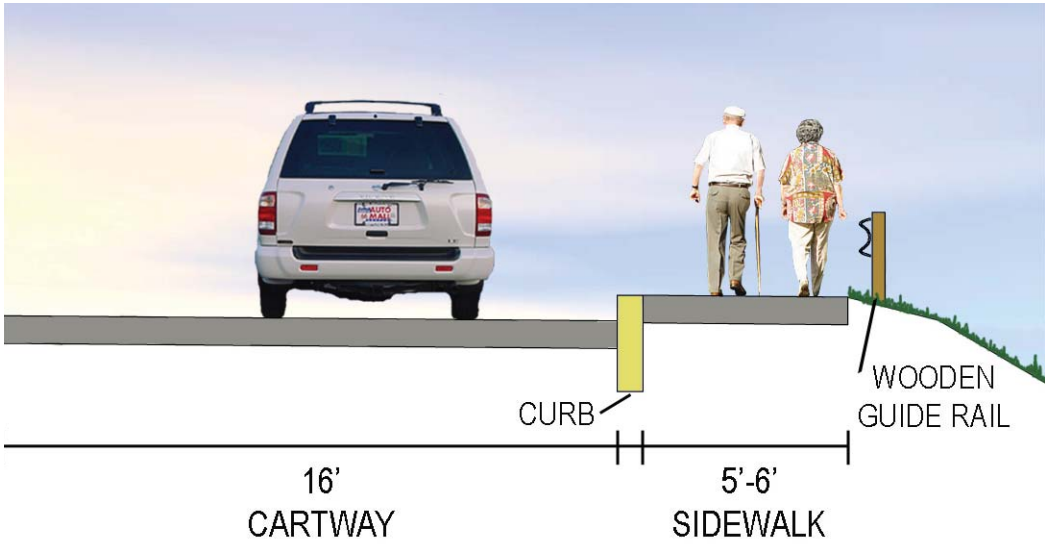
Washington Township, NJ Trail System

Sidewalks - Sidewalks in urban, suburban and rural areas are many times the base of conectivity for pedestrians. Typically sidewalks are recommended on both sides of all urban aretrial, collector, and most local roadways. Although local codes vary, AASHTO and other national publications insist that seperation of the pedestrian from motorized traffic is an essential design feature of a safe and functional roadway. Sidewalks will vary in size, depending on location (urban, suburban, rural) and total traffic volume (residential neighborhood, commerical strips). Sidewalks in residential areas are normally 5 feet while within shopping centers and downtown areas, sidewalks can range from twelve to many feet in width.

Sidewalks are not only located, or essential along the edge of streets within urban areas. Bridge sidewalks are a critical asset to connectivity by allowing pedestrians and bicyclists to pass over any impediments, such as waterways and/or steep valleys.

The basic elements for sidewalks are as follows:

- Adequate sidewalk width & ADA accessible
- Curbing
- Border areas and buffers from the travel lane
- Gentle grades
- Level cross slopes
- Well-maintained pavement surfaces
- Properly designed stairs (if required)
- Adequate corners
- Clearance distances to walls, street furniture, and other structures
- Adequate sight distances around corners and at driveways
- Continuity of the sidewalk system



Baltimore, MD

Birkdale Village, NC

Rails-to-Trails - The Rails-to-Trails Conservancy is the leading entity regarding the development, education, and advocacy for turning abandoned railways in usable trails. Throughout the country, abandoned rail beds are becoming a local, regional and multi-state trail routes. The flat, low-grade right-of-ways offer an easy conversion into a multi-use trail. Primarily constructed to have an asphalt surface, these trails can also be constructed with ground fines to allow for a permeable and softer surface. The Rails-to-Trails Conservancy offers a great deal of quality information on their website at www.railstotrails.org.

The primary characteristics of a Rails-to-Trails are:

- paved 10' pathway (can also be constructed with a solid base of gravel fines)
- flat terrain / slope
- continuous routes that are well marked and signed
- provide convenient access to-and-from desired destinations
- accomodates all types of trail users
- minimal crossings at intersections

Ironton Rail-Trail in Whitehall, PA

Rails-with-Trails - As with Rails-to-Trails the Rails-to-Trails Conservancy is the leading entity regarding the development, education, and advocacy for turning abandoned railways in usable trails. Although Rails-with-Trails are not as popular as Rails-to-Trails, sections that have active railbeds allow for trails to be built within the right-of-way, with safety measures. Fencing from the active railbeds is normally a necessity, even when a safe buffer distance is present. If a crossing is needed, other regulatory safety precautions should be taken. The Rails-to-Trails Conservancy offers a great deal of quality information on their website at www.railstotrails.org.

According to the study Rails-with-Trails: Lessons Learned by the U.S. Department of Transportation in 2002, potential benefits of constructing a Rail-with-Trail include:

- Reduced liability costs;
- Financial compensation;
- Reduced petty crime, trespassing, dumping, and vandalism;
- Reduced illegal track crossings through channelization of users
- to grade-separated or well-designed at-grade crossings;
- Increased public awareness of railroad company service;
- Increased tourism revenue;
- Increased adjacent property values; and
- Improved access to transit for law enforcement and maintenance vehicles.

Figure 18


Metropolitan Branch Trail, Washington, D.C.

Hiking Trails - Hiking trails are more primitive trails within forests and grasslands. Mainly constructed from compacted soil, these trails are much smaller than multi-use trails. According to the U.S. National Forest, trails are comprised into five different catgories. The highest class rating (5) are the recreational based trails that are within many parks or connectors to-and-from destinations. The lowest class rating (1) are undeveloped and mostly found in wild, backcountry settings. Trails within the Metropolitan area will mostly fall between Classes 3-5. Using the Federal Trail Accessibility Guidelines, universal accessible hiking trails can be built in places like Naylor Mill Park, Pemberton Park and Winter Place Park.

The following is a brief outline of trail class and trail width :

- Trail Class 1 - Minimal/Undeveloped "0-12" trail width
- Trail Class 2 - Simple/Minor Development "6-18" trail width
- Trail Class 3 - Developed/Improved "18-36" trail width
- Trail Class 4 - Highly Developed "24-60" trail width
- Trail Class 5 - Fully Developed "36-72" trail width

Class 4 Trail

Class 3 Trail

Class 5 Trail

CROSSINGS

Trails may cross roads or rail lines at-grade, above-grade or below-grade. At-grade crossings are the most common although certain situations may present the opportunity to provide a bridge or tunnel. Crossings are site specific and require careful evaluation, planning and design.

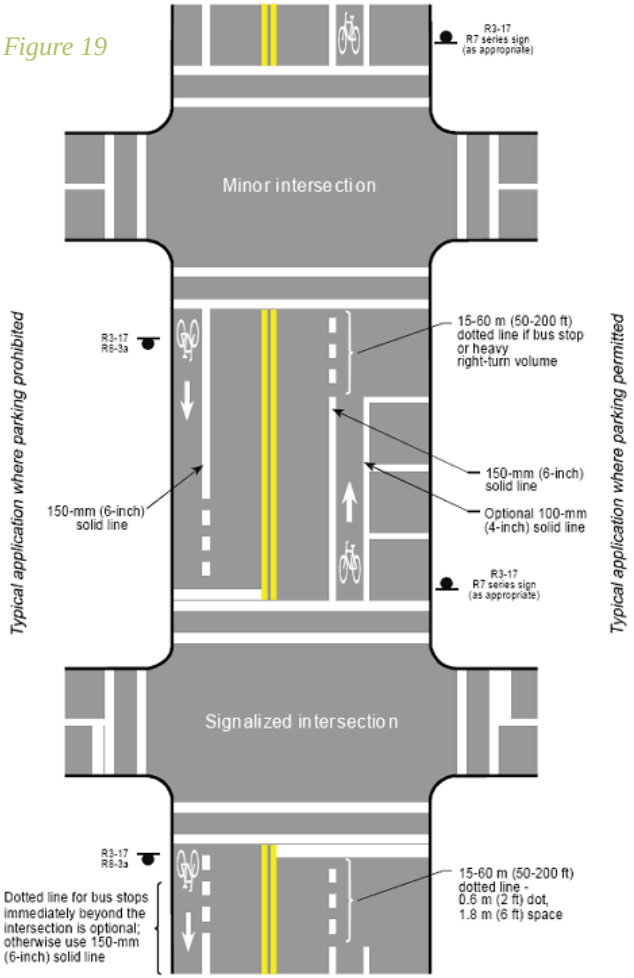
At-grade Crossings - The most ideal at-grade road crossing will experience very light traffic or provide a traffic signal that can be activated by trail users to allow for safe passage. A professional should be employed to evaluate the intersection and establish a safe method of crossing. Ideally, the crossing should take place as close to an intersection as possible, preferably in the location of the crosswalk. At-grade crossings will vary, depending on the vehicle volume and speed. At the minimum, crossings should have the following features:

- Trail Signage
- Highly visbile crosswalk
- Curb cuts

RIGHT:
Intersection with bike lanes in Boston, MA.

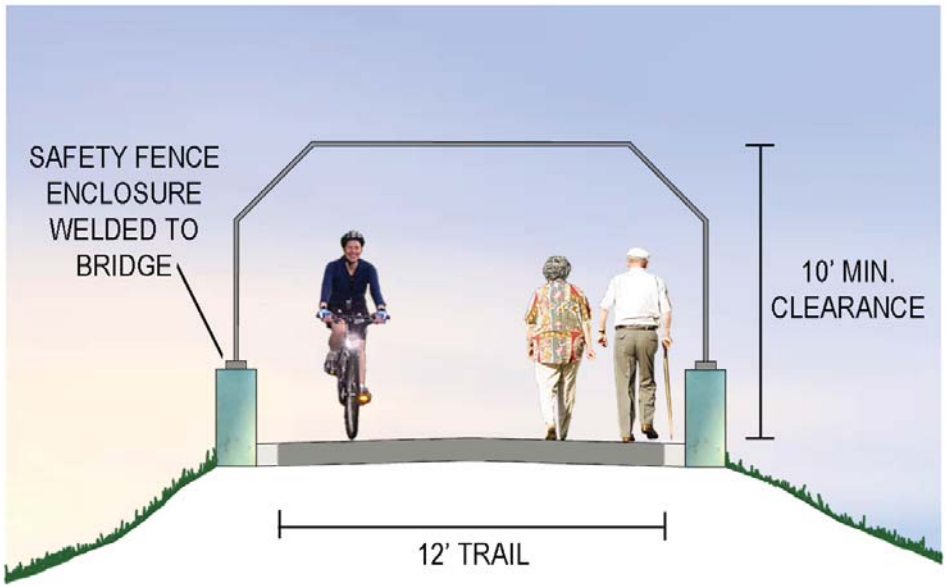
BOTTOM:
Multi-use crosswalk in Palmer Twp, PA.

Figure 19



Above- or Below-Grade Crossings - Crossing above- or below-grade minimizes conflicts between trail users and vehicles but can also be very costly. When dealing with roadways that have a large volume of high-speed traffic, the only feasible alternative may be an above- or below-grade crossing. Above-grade crossings, such as pedestrian overpasses, are perceived to be less threatening and safer by users than below-grade crossings, or tunnels. Above-grade crossings can be extremely expensive and may require long access ramps in order to meet ADA requirements.

Figure 20

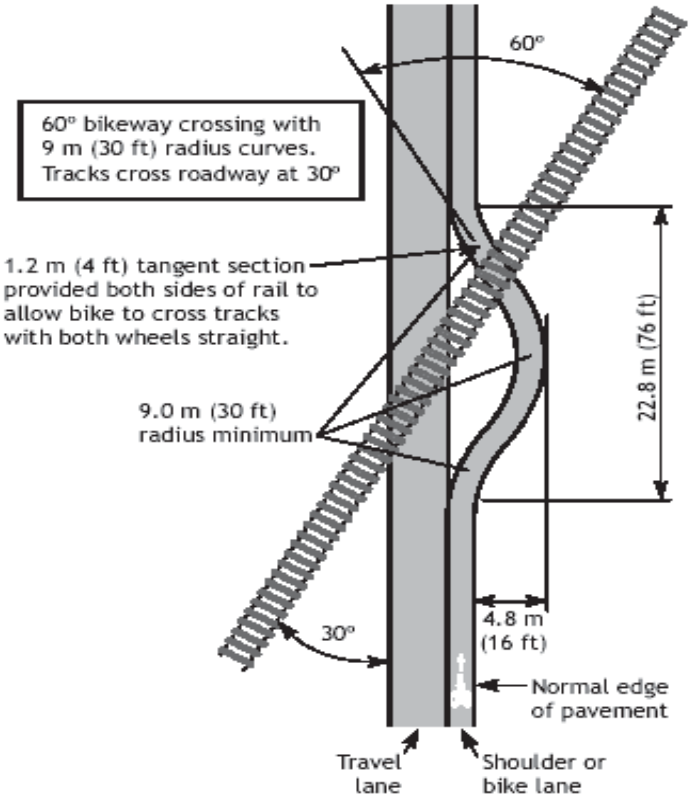


Railroad Crossings - Any proposed railroad crossings must be safe. Signs requiring cyclists to dismount when crossing the tracks, which would be used in conjunction with track crossing warning signs, should also be installed. The railroad company must be consulted prior to installing any crossing. If an at-grade railroad crossing is necessary, the trail should cross perpendicular to the tracks to prevent the front tire of a bicycle or in-line skate from becoming lodged in the track. If a right angle crossing is not possible, another safety alternative should be used, such as:

- A compressible flangeway filler could be installed to reduce the chance of an accident for a cyclist.
- The trail could be widened, giving cyclists the opportunity to approach the crossing at a right angle to the tracks.

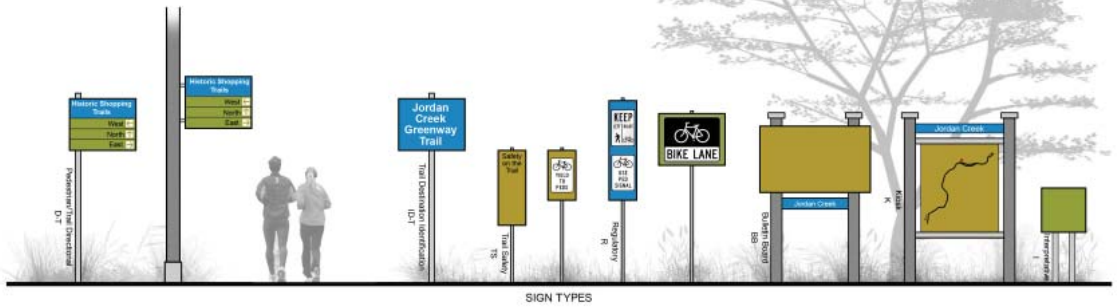
Figure 21

Figure 22



SIGNAGE

Signs portray vital information and play an important role in the success of roadway and greenway trails. Signs can serve to regulate, warn, inform, and educate trail users. The Federal Highway Administration (FHWA) has outlined the size, shape and color criteria for signs in the Manual on Uniform Traffic Control Devices (MUTCD). Where feasible, and to reduce exposure to liability and promote safe trail use, the standard color and shapes should be followed. Signs need to be designed and placed appropriately within the trail route but done so in a manner that does not lead to cluttering of the landscape. The materials chosen for a sign system should be consistent and take into account budget, aesthetics, durability, and maintenance costs. Some options for materials include plastics, fiberglass, wood, aluminum, steel, brass, bronze, stone, fabric and recycled products. Selected materials should give the sign prominence but still blend well with the surrounding environment.



LEFT:
Illustrations showing wayfinding signage..

RIGHT:
Wayfinding signage in Golden, CO.

CHAPTER 4 REFERENCES

FIGURE 1 - Striped Shoulder Photo - Laura Sandt. 2010. *http://www.pedbikeimages.org/pubdetail.cfm?picid=1809*
FIGURE 2 - Wide Outside Lane Photo - Steven G. Goodridge Ph.D. - *http://www.humantransport.org/bicycledriving/library/passing/index.htm*
FIGURE 3 - Road Diet: Retrofitting Bike Lanes By Reducing Travel Lane Widths - "*Oregon Bicycle and Pedestrian Plan*" Oregon Department of Transportation. Salem, OR. 1995
FIGURE 4 - Conventional Bike Lane Pictures. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 17
FIGURE 5 - Conventional Bike Lane Design Guidelines. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 6
FIGURE 6 - Buffered Bike Lane Pictures. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 29
FIGURE 7 - Buffered Bike Lane Rendering. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 27
FIGURE 8 - Buffered Bike Lane Rendering. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 27
FIGURE 9 - Buffered Bike Lane Design Guidelines. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 20
FIGURE 10 - Reducing the Number of Travel Lanes on a One-Way Street - "*Oregon Bicycle and Pedestrian Plan*" Oregon Department of Transportation. Salem, OR. 1995
FIGURE 11 - Contra-flow Bike Lane Rendering. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 42
FIGURE 12 - Contra-flow Bike Lane Pictures. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 44
FIGURE 13 - Contra-flow Bike Lane Design Guidelines. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 33
FIGURE 14 - Raised Cycle Track Rendering. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 94
FIGURE 15 - Raised Cycle Track Design Guideline. National Association of City Transportation Officials. "*Urban Bikeway Design Guide*". April, 2011. Pg. 78
FIGURE 16 - Colored Bike Lane Picture. *http://www.international.fhwa.dot.gov/pubs/pl10010/images/figure28.jpg*
FIGURE 17 - Bicycle Boulevard Design Guideline. Federal Highway Authority. *http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/images/fig1412.gif*
FIGURE 18 - Metropolitan Branch Trail South of 8th Street - Washington, D.C. East Coast Greenway. http://www.flickr.com/photos/eastcoastgreenway/4223182754/
FIGURE 19 - Bike Lane At-Grade Intersection Crossing. Federal Highway Authority. *http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/chapt15.cfm*
FIGURE 20 - Stairway with Bicycle Rolling Troughs - Capital Crescent Trail - Bethseda, MD. http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/chapt19.cfm
FIGURE 21 - At-grade Crossing Of Bike Lane & Train. Minneapolis, MN. 2009. *http://www.flickr.com/photos/jamesbondsv/3905716512/*
FIGURE 22 - Rail-with-Trail Picture. Virginia Bicycling Federation. *http://www.vabike.org/wp-content/uploads/2009/04/rail-with-trail-crossing.jpg*

CHAPTER 5 - IMPLEMENTATION AND FUNDING

The purpose of this chapter is to outline other implementation techniques and funding opportunities. The implementation techniques can be productive to assist in the creation of the Salisbury / Wicomico Biking & Hiking Feasibility Study.

IMPLEMENTATION NEEDS

This Biking and Hiking Study for the Salisbury/Wicomico is just a first step in creating a metropolitan area-wide trail network system. The purpose of this study is to 1) identify existing safe biking and hiking trails, 2) identify desired locations for trails and 3) identify linkages. The intent of this "first step study" is to plan for an area-wide trail network that effectively serves the entire metropolitan area. However, it is only a first step, as further study and evaluation is needed to make this trail system a "reality". Much needs to be done to achieve an effective trail network in the Salisbury/Wicomico MPO area. It is important that funding be made available to undertake the next very important steps to prioritize and implement a coordinated trail improvement program.

All trail segments discussed in Chapter 3 - Concept Plan should be further evaluated and the proposed route studied. Future options may become more evident as development continues in the region. Next steps in the planning process should be as follows:

- Evaluate and select future trails for development
- Prioritize trail corridors in order of importance
- Develop a plan for each individual trail plan improvement
- Create parternships with non-profits, schools, hospitals, etc. for support and funding
- Construct trail improvement of priority designated trails
- Add new completed trail segment to the official Salisbury / Wicomico MPO trail map
- Gather volunteers for continued trail maintenance and support
- Promote the new Salisbury / Wicomico trails through advertising and public information programs

In Maryland, other major tools are available to help implement the plan:

Capital Improvements Planning

The S/W MPO should continually plan and budget for major capital expenditures. "Capital" improvements are projects involving a substantial expense to construct or improve major public facilities that have a long life span and that are not funded through annual operating expenses. Examples of capital projects include major street improvements, major storm sewer construction projects, and parkland acquisition.

A Capital Improvements Program (CIP) identifies needed projects, establishes project priorities, identifies possible funding sources, and helps to budget for the project. A typical CIP looks five years in the future. A CIP should identify major street reconstruction projects that will be needed over the next few years. Coordinating street reconstruction helps utilities avoid the need to cut into a street shortly after repaving. Through a CIP, many different projects can be combined into a single bond issue, which avoids the high administrative costs of multiple bond issues. A CIP also allows a municipality to carefully time any bond issues to take advantage of lower interest rates.

Computerized Mapping

Wicomico County maintains a computerized mapping system, often referred to as a Geographic Information System (GIS). This information is updated regularly, and is a good source for planning.

Subdivision and Land Development Ordinance

A Subdivision and Land Development Ordinance (SALDO) regulates the creation of new lots, the construction of new streets by developers, and the site engineering of new commercial, industrial, and institutional buildings. The SALDO also contains design standards and required improvements for new development.

FUNDING OPPORTUNITIES

STATE FUNDING

State funding opportunities are as follows:

State Highway Administration:

ADA Retrofit (Fund 33): This is a fund to upgrade existing sidewalks, curb ramps, and driveway entrances along state roadways to be ADA compliant.

Requirements:

- Fund 33 is geared to retrofit existing, non-compliant sidewalks up to the latest ADA standards.
- Projects are not limited to Priority Funding Areas.

Contact:

- SHA Innovative Contracting Division, 410-545-8766

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.

Requirements:

- Town or County must help secure right-of-way, easements, or right-of-entry agreements.
- Town or County must agree to maintain sidewalks after completion.
- Projects are not limited to Priority Funding Areas; the only requirement is the presence of a transit stop.

Contact:

- SHA Innovative Contracting Division, 410-545-8766

Sidewalk Retrofit (Fund 79): This is a fund to construct missing sidewalk segments to fill gaps within the pedestrian network. The missing segment must be located either in a "designated neighborhood" per Section 6-301 of the Housing and Community Development Article, or within a Priority Funding Area.

Requirements:

- Town or County must provide public notice of the sidewalk project and an opportunity to feedback from citizens; help secure right-of-way, easements, or right-of-entry agreements; and agree to maintain or repair the sidewalks after completion.
- If the sidewalk is located in a "Sustainable Community" per the Housing and Community Development Article, Section 6-301 and 305, the sidewalk construction may be funded entirely by the state.
- If the sidewalk is located in a Priority Funding Area and it is determined that a substantial public safety risk or significant impediment to pedestrian access and the adjoining roadway is not being constructed or reconstructed, the sidewalk construction shall be identified as a "system preservation" project and may be funded 100 percent.
- If the sidewalk is located in a Priority Funding Area and requested by the local government, the construction costs may be split between the state (75%) and local jurisdiction (25%).

Contact:

- SHA Innovative Contracting Division, 410-545-8839

Bicycle Retrofit (Fund 88): This is a fund to provide bicycle improvements along state roadways.

Requirements:

- Town or County must provide an opportunity for public input on the project and help secure right-of-way, easements, or right of entry agreements.
- In the case of off-road improvements, such as a side path or shared use path, the Town or County must agree to maintain the improvement Community Safety and Enhancement Program (Fund 84): This is a fund for "streetscape" projects to promote safety and economic development.
- The roadway segment needs to be located either within a "Sustainable Community" per Section 6-301 of the Housing and Community Development Article, or within a Priority Funding Area.

Contact:

- SHA Innovative Contracting Division, 410-545-8839

Community Safety and Enhancement Program (Fund 84): This is a fund for "streetscape" projects to promote safety and economic development.

Requirements:

- Town or County must help secure right-of-way, easements, or right of entry agreements.
- Town or County has to agree to maintain sidewalks and betterments after completion.
- The project limits need to be located within a Priority Funding Area.

Contact:

- SHA Community Design Division, 410-545-8900

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 trials, trailheads, bike parking, bike lane striping that is part of an off-road system, bike and pedestrian bridges, and underpasses.

Requirements:

- Town is responsible for 50% of total project cost as a cash match. The TEP grant can cover up to 80% of the construction costs as long as it doesn't exceed 50% of the total project costs.
- Competitive program
- Project must be open to the public and benefit all of Maryland, not a specific group or individual.
- Be independent project unrelated to planned or existing highway projects or routine highway improvements or as a required mitigation for a planned or existing highway project. TEP projects may be enhancements to larger federal—aid highway projects.
- Be located on publicly-owned right of way or on right of way encumbered with a permanent easement held by a state agency or the government agency sponsoring or co-sponsoring the project.
- Comply with ADA, NEPA, and all other applicable state and federal regulations.
- Serve a transportation purpose beyond just recreational.

Contact:

- SHA TEP Coordinator, 410-545-8509

Safe Routes to Schools: This programs provides funds for educational and infrastructure improvements in the vicinity of state funded K-8 grade institutions that promote walking and bicycling of students to school.

Requirements:

- Sidewalk improvements have to be within 1.5 mile radius of state funded elementary and middle schools.

Contact:

- Maryland Highway Safety Office, 800-323-6742

National Recreational Trails Program (NRT): This is a federally funded program to assist local jurisdictions in developing smaller scale trailhead and restoration projects.

Requirements:

- Projects cannot exceed $40,000 for new construction and $30,000 for other projects.
- A local match of 20% is required.

Contact:

- Office of Environmental Design, SHA, 410-545-8637

Maryland Department Transportation

Maryland Bikeways Program: The Maryland Bikeways Program supports plans and projects that maximize the use of Maryland's existing bicycle facilities, make needed connections and support Maryland's bike sharing efforts. Eligible projects include bicycle plans or feasibility studies, design and construction of infrastructure to better connect communities to transit and other destinations, linkage of a local bike route to a state bicycle facility and minor retrofits, signing, striping, or grate replacement to enhance use and visibility of on-road bike facilities.

Requirements:

- Local jurisdiction has to apply or State agency can apply with a letter of support from the local jurisdiction
- A letter of support from the agency responsible for operating and maintenance activities.
- Local of match of 20-50% required depending on the project criteria

Contact:

- MDOT; www.cycle.maryland.gov

FEDERAL FUNDING

National Scenic Byway Discretionary Grant – This supports projects associated with a Scenic Byway

Requirements:

- Project has to be located on a National Scenic Byway, All-American road, or one of America's Byways
- Project has to be consistent with the corridor management plan for the byway, or is intended to foster the development of such a plan, and is carried out to make the byway eligible for designation as a National Scenic Byway; an All-American Road; or one of America's Byways

Contact:

FHWA (http://www.fhwa.dot.gov/discretionary/nsbp2012selc.htm)

Rail Highway Crossing Hazard Elimination in High Speed Rail Corridors – This is a FHWA Discretionary program for safety improvements to private and public highway-railroad grade crossings along Federally-designated High Speed Rail Corridors, including pedestrian crossings.

Requirements:

- Improves safety at a crossing that has recent activity or high potential for accidents between pedestrian and/or vehicle and HSR or intercity passenger rail
- Upgrades a crossing or a series of crossings to create a "sealed corridor" segment utilizing advanced warning technology, four-quadrant gates, or median separators with preference to crossing closures
- Supports a HSR corridor service development plan
- Is included on a corridor with active HSR or intercity passenger rail service with programmed capital funding for an increase in service frequency or speeds of 90mph or greater. Preference to corridors with speeds 110 mph or greater
- Will generate improvements to existing HSR or intercity passenger rail service, as reflected by estimated increases in ridership, increases in operational reliability, increases in average and/or top operating speeds, reductions in trip times, additional service frequencies, and other related factors
- Demonstrate support from key project partners, including the infrastructure operating railroad, local governments, and other relevant stakeholders
- Conforms to the FRA's "High-Speed Passenger Rail Safety Strategy" guidance
- Other factors:
    - Integration with HSR investments
    - Corridor location
    - Project implementation and delivery
    - Priority Safety Investment

Contact:

(FHWA – 202-366-5892); (FRA 202-493-6370); http://www.fhwa.dot.gov/discretionary/rhchehsrc2012addi.htm

Public Lands Highways Discretionary Program – This is a FHWA discretionary program that can be used for planning, research, and engineering for highways, roads, parkways, and transit facilities that are within, adjacent to, or provide access to Indian reservations and Federal Public lands, including national parks, refuges, forests, recreation areas, and grasslands.

Requirements:

- Project must be adjacent, within, or provide access to either an Indian reservation or Federal Public lands including national parks, refuges, forests, recreation areas, and grasslands.

Contact:

(202-366-1586), FHWA (http://flh.fhwa.dot.gov/programs/plh/discretionary/)

Transportation, Community, and System Preservation Program – This is a FHWA Discretionary Program provides funding for planning, implementation, and research to investigate and address relationships among transportation, community, and system preservation plans and identify private sector-based initiatives to improve those relationships.

Requirements:

- SHA/MDOT, MPOs, local governments, and/or tribal governments have instituted preservation or development plans and programs that are coordinated with State and local preservation or development plans including TOD plans; promote cost effective and strategic investments in transportation infrastructure that minimize adverse impacts on the environment; or promote innovate private sector strategies.
- SHA/MDOT, MPOs, local governments, and/or tribal governments have instituted other policies to integrate transportation, community, and system preservation practices, such as spending policies that direct funds to high-growth area; urban growth boundaries to guide metropolitan expansion; "green corridors" programs that provide access to major highway corridors for areas targeted for efficient and compact development; or other similar programs.
- Have preservation or development policies that include a mechanism for reducing potential impacts of transportation activities on the environment;
- Demonstrate a commitment to public and private involvement, including the involvement of nontraditional partners in the project team.

Contact:

(202-366-0799), FHWA http://www.fhwa.dot.gov/discretionary/tcsp2012selc.htm

More funding opportunities can be found at the The Federal Highway Administration & Federal Transit Administration webiste (http://www.fhwa.dot.gov/HEP/bkepedtble.htm).