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Chapter 8 : Implementation Strategies

Goal 2: Identify a hierarchy of key connections and destinations within Carroll County.

Goal 6: Leverage and utilize, to the greatest extent possible, state and federal funding for improvements to existing bicycle and pedestrian facilities as well as construction of new bicycle and pedestrian infrastructure in a way that will yield the greatest impact on the County as a whole.

Goal 7: Work with local elected officials, government agencies, and the community to promote and emphasize bicycle and pedestrian safety training and outreach.

The purpose of this chapter is to establish criteria to consider when implementing bicycle and pedestrian infrastructure. This chapter will prioritize projects that are listed in Chapters 3 and 4 and prioritize destinations based on a ranking system. Implementation challenges will be discussed with possible solutions. Information will be provided on the use of various public and private funding sources. Finally, ideas will be put forth for engaging public officials and the public in alternative transportation and safety matters, as stated in Chapters 6 and 7.

It is important that this plan is consulted when reviewing proposed projects with any type of road construction or development component so that planned bicycle and pedestrian facilities can be incorporated into the project proposals.

County Priority Project Assessment

In order to optimize limited funding, it is important to prioritize projects that will strengthen the County's bike-ped network. For the purposes of prioritizing where to direct County resources bike-ped projects are ranked similar to the method utilized in the *2014 Freedom Bicycle-Pedestrian Master Plan and Assessment* (Freedom Bike-Ped Plan). The full tables and methodology for how projects are ranked can be seen in the Appendix.

Projects that have a status of "Under Construction" are usually funded through the planning and design/engineering phases of a project. Construction funding is either expected in the next year or has already been received. Therefore, these projects are automatically a top priority.

County Recreation and Parks projects that have a status of "Adopted/Planned" or "Future Connection" were assessed based on a ranking system to determine priority. The ranking system is based on the following criteria:

- Whether or not the project meets the *Carroll County Bicycle-Pedestrian Master Plan* goals
- Whether or not the project improves user safety or is associated with ADA compliant infrastructure (more safety elements = more points)



- Whether or not the project is concurrent with an existing or planned road-related project
- Whether or not the project will connect to an “Existing” or “Under Construction” bike-ped project
- Whether or not the project will connect to key destinations (more destinations = more points) (see Table 8-1)
- The amount of miles of infrastructure needed to complete the project (fewer miles = more points)
- The amount of miles to reach a destination (fewer miles = more points)
- The density at which the surrounding land was developed (more density = more points)
- Construction opportunity: land acquisition and environmental constraints are major hindrances; therefore, if these issues are identified in a project, it will receive less points
- Construction opportunity: public road right-of-way may enable a project; if identified the project will receive more points
- Construction opportunity: existing railroad and utility easements can serve to the advantage or disadvantage of a project, resulting in either more or less points

Table 8-1: Key Destinations in the County

	Places that fall within the top four categories mentioned by citizens at the Citizens Outreach Meeting ⁱ as a place to which they would like to bike or walk.	Short trip destinations, where encouraging walking and biking will reduce vehicle trips.
Destinations	<ul style="list-style-type: none"> • Parks (as a top destination, this receives the most weight) • Historical sites • Restaurants • Grocery stores 	<ul style="list-style-type: none"> • Retail and shopping centers • Schools (from neighborhoods within a 1-mile radius, based on the school system’s transportation policy) • Frequented public destinations that include, but are not limited to, parks; senior and community centers; libraries; and County, federal, and state offices and facilities • Commercial and Employment centers

Note: Tourism trails are marketed for the purpose of generating economic tourism dollars and bringing in visitors to the County. There is no infrastructure or way-finding signage associated with the tours. These trails do not correspond to the “Adopted/Planned” or “Future Connection” trail status and therefore are not assessed for priority. More information on Carroll County Tourism Trails can be found in Chapter 3: Existing Conditions.



Table 8-2 shows the priority order in which the County pedestrian projects (listed in Chapters 3 and 4) should move forward. Sidewalk and trail/bicycle infrastructure projects have been separated to ensure that projects are prioritized on the basis of both trail type (bicycle lanes, paths and designated routes, shared-use-paths and pathways, sidewalks, and crosswalks) and trail use (bicycle, bicycle and pedestrian, and pedestrian). County trails and bicycle infrastructure projects are ranked in Table 8-3.

Twenty-two trail and bicycle projects totaling 12.8 miles were assessed based on how well each meets the vision and goals of the Bicycle-Pedestrian Master Plan. Table 8-4 prioritizes bike-ped projects located along state roads. State roads (identified in Chapters 3 and 4) are MD 97, MD 31, MD 75, MD 26, MD 32, MD 832, and MD 140. Regional bike-ped projects are a product of collaboration between two or more jurisdictions and are ranked in the order in which they should move forward in Table 8-5.

Table 8-2: County Priority Pedestrian Projects

Trail Name	Trail Type	Trail Use	Trail Description	Location	Length (miles)	Ranking Priority
Monroe Street	sidewalk	ped	Sidewalk along Monroe Street from Father Joe’s Way to Englar Road; provides connection to West Middle School	Westminster	0.2	1
Gist Road & Washington Road	sidewalk	ped	Fill gaps between Stoner Avenue and the hospital entrance	Westminster	0.1	1
Stoner Avenue	sidewalk	ped	Fill gaps between the Senior Center, Advanced Radiology, and the hospital	Westminster	0.2	1
MD 32 Sidewalk	sidewalk	ped	MD 32 from Washington Lane to Kate Wagner Road; a Safe Routes to School project for Robert Moton Elementary School; funded through design	Westminster	0.4	2

County Priority Pedestrian Projects

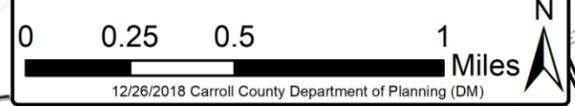
Legend

- Public Schools
- Private Schools
- Roads
- Railroads
- Sidewalk
- Ponds and Reservoirs
- Recreation Facilities
- Growth Area Boundary
- Corporate Limits

Pedestrian

- Adopted/Planned
- Future Connection

Note: All trails are subject to the jurisdictions process of development



Map 8-1: County Priority Pedestrian Projects

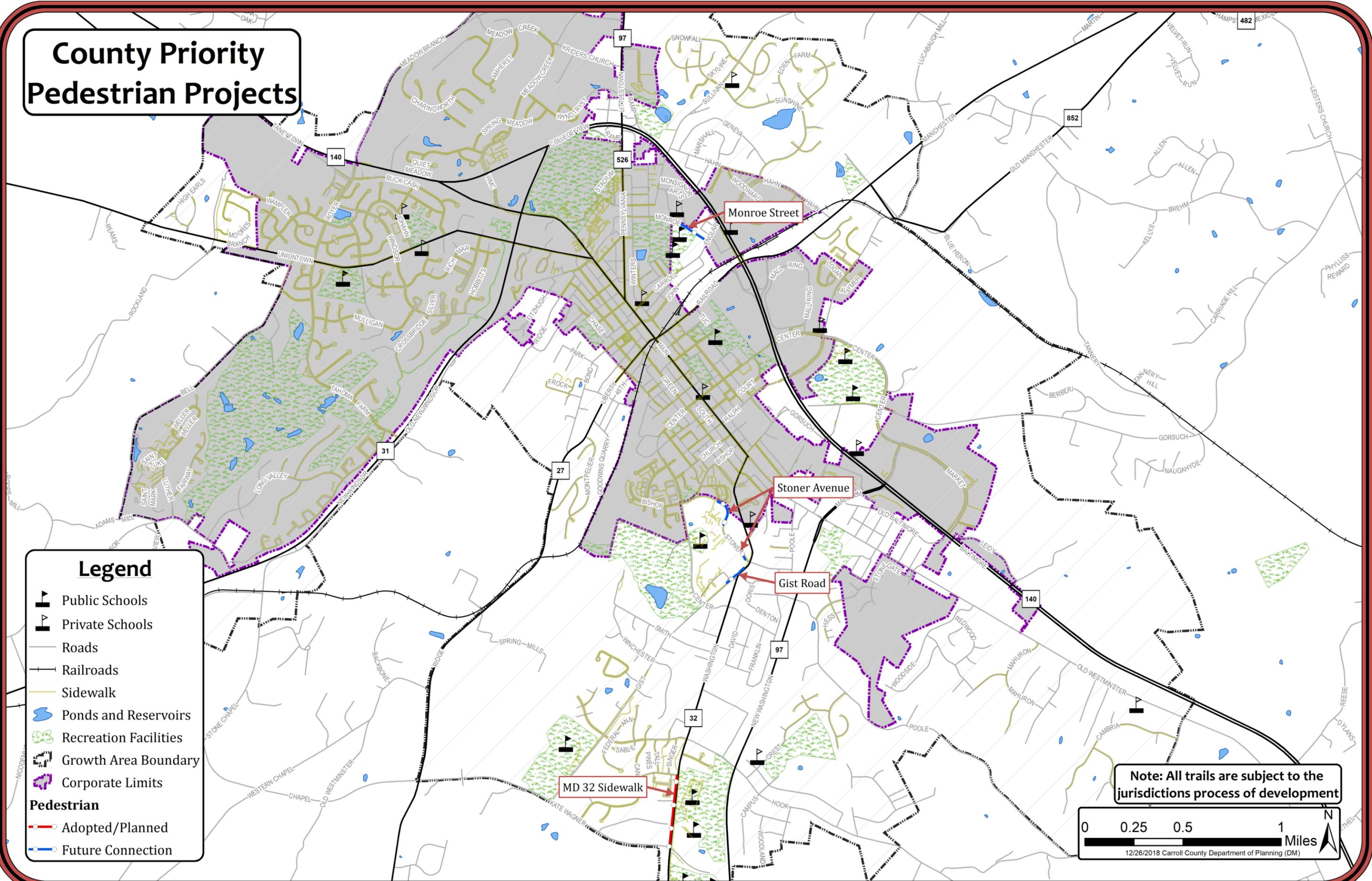


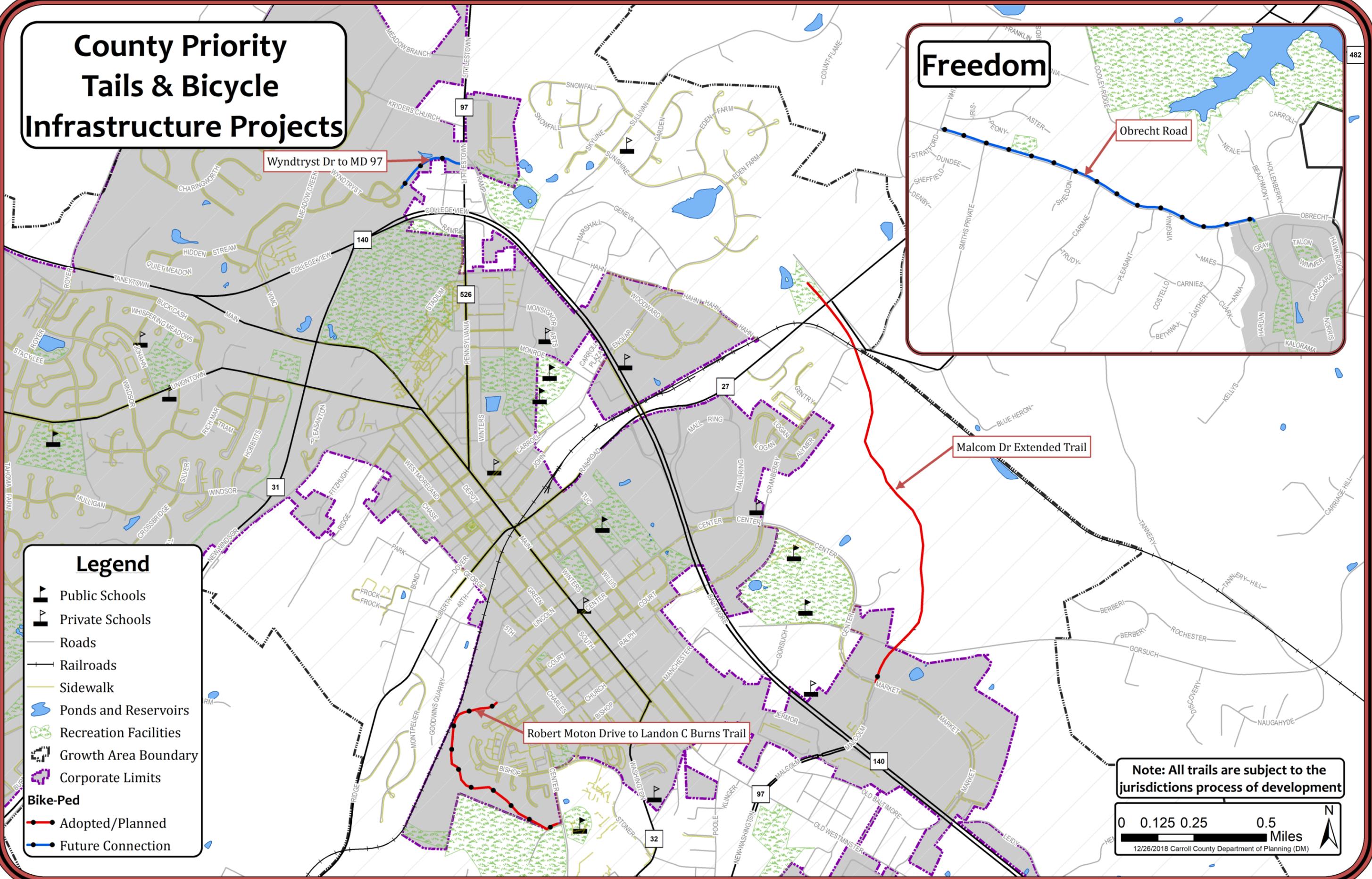


Table 8-3: County Priority Trails and Bicycle Infrastructure Projects

Trail Name	Trail Type	Trail Use	Trail Description	Location	Length (miles)	Ranking Priority
Malcom Drive Extended Trail	shared-use-path	bike-ped	Parallel to planned extension of Malcolm Drive, from Market Street to MD 27, through the intersection of North Cranberry Road and Old Manchester Road	Westminster	1.6	1
Robert Moton Drive to Landon C Burns Trail	shared-use-path	bike-ped	Connects existing Landon C Burns trail to government facilities around Robert Moton Drive	Westminster	0.8	1
Wyndtryst Drive to MD 97	TBD	bike-ped	Complete sidewalk connection from MD 97 to near Upper Field Circle; possible combination of sidewalk and a trail	Westminster	0.3	1
Obrecht Road	TBD	bike-ped	Between White Rock Road and Hollenberry Road	Sykesville	1.2	2

County Priority Trails & Bicycle Infrastructure Projects

Freedom



Legend

- Public Schools
- Private Schools
- Roads
- Railroads
- Sidewalk
- Ponds and Reservoirs
- Recreation Facilities
- Growth Area Boundary
- Corporate Limits

Bike-Ped

- Adopted/Planned
- Future Connection

Obrecht Road

Malcom Dr Extended Trail

Wyndtryst Dr to MD 97

Robert Moton Drive to Landon C Burns Trail

Note: All trails are subject to the jurisdictions process of development

0 0.125 0.25 0.5 Miles

12/26/2018 Carroll County Department of Planning (DM)

Map 8-2: County Priority Trails & Bicycle Infrastructure



Table 8-4: County Priority State Road Bike-Ped Projects

Trail Name	Trail Type	Trail Use	Trail Description	Location	Length (miles)	Ranking Priority
MD 26	TBD	bike-ped	Pedestrian and bicycle facilities from Klees Mill road to just east of Monarch Drive	Eldersburg	5	1
MD 140 (Taneytown Pike) & MD 832 (Old Taneytown Road) – Westminster to Taneytown	TBD	bike-ped	Connection from WMC Drive to Meadow Branch Road to MD 832 to Tyron Road to MD 140 to MD 140/Antrim Boulevard intersection (connection between Westminster & Taneytown)	Westminster & Taneytown	9.0	2
MD 31 – Westminster to New Windsor	TBD	bike-ped	Connection from West Main Street to Tibbetts Lane	Westminster & New Windsor	5.2	3
MD 32	TBD	bike-ped	Pedestrian and bicycle facilities Freedom Elementary School to the Howard County line	Sykesville	2.1	4

County Priority State Road Bike-Ped Projects

Legend

- Private Schools
- Public Schools
- Roads
- Railroads
- Sidewalk
- Ponds and Reservoirs
- Recreation Facilities
- Growth Area Boundary
- Corporate Limits

Bike-Ped

- Adopted/Planned
- Future Connection

Bicycle

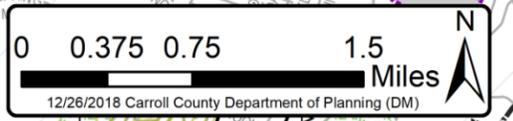
- Future Connection

Freedom

MD 31 - Westminster to New Windsor

MD 140 & MD 832

Note: All trails are subject to the jurisdictions process of development



Map 8-3: County Priority State Road Bike-Ped Project

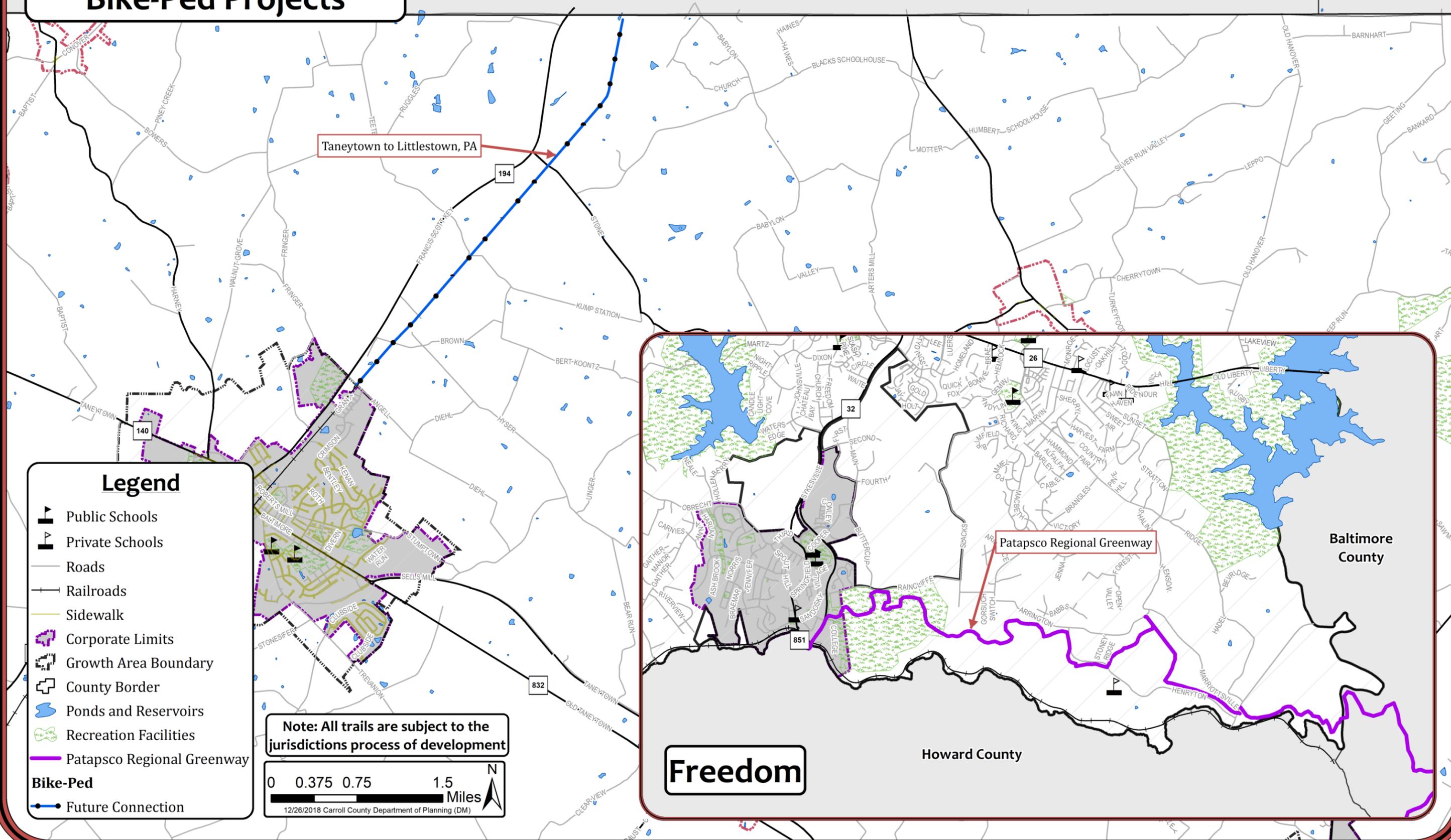


Table 8-5: County Priority Regional Bike-Ped Projects

Trail Name	Trail Type	Trail Use	Trail Description	Location	Length (miles)	Ranking Priority
Patapsco Regional Greenway	TBD	bike-ped	Follows the Patapsco River from Sykesville into Howard County	TBD	TBD	1
Taneytown to Littlestown, PA	TBD	bike-ped	Follows the abandoned rail line to Pennsylvania from Angell Road to the County/state boundary	Taneytown to Littlestown, PA	4.0	2

County Priority Regional Bike-Ped Projects

Adams County, PA



Taneytown to Littlestown, PA

Patapsco Regional Greenway

Freedom

Legend

- Public Schools
- Private Schools
- Roads
- Railroads
- Sidewalk
- Corporate Limits
- Growth Area Boundary
- County Border
- Ponds and Reservoirs
- Recreation Facilities
- Patapsco Regional Greenway
- Bike-Ped**
- Future Connection

Note: All trails are subject to the jurisdictions process of development



12/26/2018 Carroll County Department of Planning (DM)

Map 8-4: County Priority Regional Bike-Ped Projects



The *1994 Greenways, Bicycle, and Pedestrian Facilities Network Technical Report* (1994 Technical Report) identifies most long-term projects. The top projects from the 1994 Technical Report that are identified in the priority project assessment of this plan are Old Taneytown Road/MD 832 - Extension into Westminster, MD 31 - Westminster to New Windsor, Old Taneytown Road/MD 832, Patapsco Regional Greenway, and Taneytown to Littlestown, PA. The 1994 Technical Report was not adopted; therefore the trails are designated “Future Connections” from Chapter 4

It is important to note that economic conditions and project circumstances are constantly changing. Most of the projects mentioned in this plan have not gone through engineering and design. There may be additional components or realignments that could change the priority points it acquired when originally assessed. When deemed necessary by the Planning and Zoning Commission, project priorities may be reassessed to determine if changes to a project have improved the way it addresses the vision and goals in the Bicycle-Pedestrian Master Plan.

Funding

County bike-ped projects have a history of being funded through the County’s Community Investment Plan (CIP) process and through various government grant-funding sources. The Community Investment Plan (CIP) is a six-year timetable for the installation of permanent public structures, facilities, roads, and other public improvements based upon budget projections. In today’s competitive funding climate, federal and state grant programs typically require a local match. The CIP, which is the source of funds for the County’s local match, is a requirement to move County-led development projects forward. Moreover, grant programs are usually set up on a reimbursement basis. In such cases, the County CIP provides the initial grant funds, as well, that are later reimbursed to the County. There are limited funding opportunities on all government levels to address transportation needs.

Carroll County Recreation and Parks receives annual funding of \$50,000 per year provided by County Commissioners in approved six-year capital budget for Trail Development. These funds are intended to support new and expanded trails for residents and may be used as a local match for grant funding or to help complete smaller projects

Leveraging of funding opportunities is to use private or public funding to maximize gains. Goal two of the Freedom Bike-Ped Plan is to leverage and utilize, to the greatest extent possible, state and federal funding for improvements to existing bicycle and pedestrian facilities as well as construction of new bicycle and pedestrian infrastructure.ⁱⁱ Some options to consider that would allow the leveraging of funding opportunities:

- Market the benefits of a project to surrounding businesses and seek private investment for mutually beneficial projects
- Form friends groups that will assist with maintenance of a trail
- Work with developers to incorporate bike-ped transportation and safety improvements in site plans



- Increase the multiple functions of a bike-ped project, including:
 - Increase the amount of destinations along the alignment
 - Increase the historic and cultural attractions near and along the route
 - Improve user safety

A Countywide trail system, consisting of over 200 miles of trails, could cost nearly \$52 million to implement (based on an average cost of \$48 per linear foot supplied by the Carroll County Department of Recreation and Parks) if the County funded the complete proposed trail system. The cost to the residents of the County is expected to be much less because much of the money to provide the needed infrastructure comes from grant programs and developers.

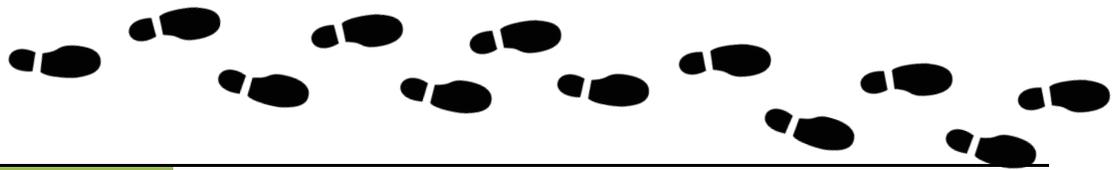
Recreation and Parks primary funding sources:

- General fund (County)
- Park Restoration fund (County)
- Program Open Space (State)
- Other grants (more often than not the County must match the grant money; this can create a timing issue with providing matching funds)

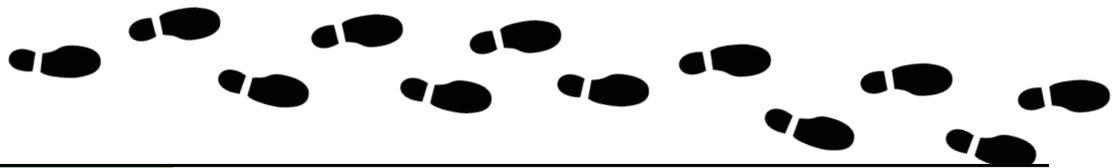
The federal and state grant programs listed in Table 8-6 (Primary Grants) are the primary funding sources for bicycle and pedestrian projects. State staff can help local communities identify ways to combine the grants to successfully implement projects. All grant funding is provided on a reimbursement basis.

Table 8-6: Primary Grants

Program	Description
Transportation Alternatives Program (TAP) (SHA)	<p>The program provides federal funding for projects that enhance the cultural, aesthetic, historic, and environmental aspects of the intermodal transportation system.</p> <p><i>Eligible Grantees:</i></p> <ul style="list-style-type: none"> • Metropolitan Planning Organizations (select projects for 50% of available funding) • Local/County Jurisdictions • Transit Agencies • Federal Public Land Agencies • Local/County School Districts <p><i>Eligible Bike/Pedestrian Projects:</i></p> <ul style="list-style-type: none"> • Planning and Design of Bike/Pedestrian Facilities and Safe Routes for Non-Drivers • Construction of Bike/Pedestrian Facilities • Construction of Safe Routes for Non-Drivers • Conversion of Abandoned Rail to Bike/Pedestrian Trails
Maryland Bikeways	The program provides state funding for projects that maximize



Program (MDOT)	<p>bicycle access and fill missing links in the state’s bicycle system, focusing on connecting shared-use paths and roads and enhancing last-mile connections to work, school, shopping and transit.</p> <p><i>Eligible Grantees:</i></p> <ul style="list-style-type: none">• State Agencies• Metropolitan Planning Organizations• Local/County Jurisdictions• Transit Agencies• Federal Public Land Agencies <p><i>Eligible Bike/Pedestrian Projects:</i></p> <ul style="list-style-type: none">• Feasibility Assessments, Design and Engineering• Construction of Shared Use Paths, Cycletracks, and Bicycle Lanes• Shared Lane and other pavement markings• Bicycle Route Signage and Wayfinding• Bicycle Capital Equipment (e.g., parking)• Other Minor Retrofits to Support Bicycle Routes• Education Materials to Support Bikeway Projects
Recreational Trails Program (SHA)	<p>A federally-funded program assisting development and maintenance of smaller scale motorized and non-motorized trail, trailhead, and restoration projects. Examples of trail uses include hiking, bicycling, inline skating, equestrian use, canoeing, kayaking, cross-country skiing, snowmobiling, off-road motorcycling, all-terrain vehicle riding, four-wheel driving, or using other off-road motorized vehicles. Recreational Trails is now a part of the larger Transportation Alternatives Program due to the latest federal transportation law, MAP-21, but has retained dedicated funding.</p> <p><i>Eligible Grantees:</i></p> <ul style="list-style-type: none">• State Agencies (DNR projects receive 50% of funding)• Local/County Jurisdictions• Private Groups/Individuals (with government agency co-sponsor) <p><i>Eligible Bike/Pedestrian Projects:</i></p> <ul style="list-style-type: none">• Construction of New Trails• Maintenance and Restoration of Existing Trails• Development/Rehabilitation of Trailside Facilities and Linkages• Purchase/Lease of Trail Construction Equipment• Trail/Corridor Easement and Property Acquisition• Interpretive/Educational Programs, Signage, and Maps



	Related to Recreational Trails Use
Safe Routes to Schools (SRTS) (SHA)	<p>A program providing funding for educational and enforcement efforts (non-infrastructure) and engineering improvements (infrastructure) that benefit elementary and middle school children by enabling and encouraging students to walk and bicycle to school. Safe Routes to School projects must be requested through the larger Transportation Alternatives Program (TAP) due to the latest federal transportation law, MAP-21. The SRTS Program is a federal-funded, reimbursement program administered by the Maryland Department of Transportation State Highway Administration (MDOT SHA). Each State administers its own program and develops its own procedures to solicit and select projects for funding.</p> <p><i>Eligible Grantees:</i></p> <ul style="list-style-type: none">• Local/County Jurisdictions• Local/County School Districts <p><i>Eligible Bike/Pedestrian Projects:</i></p> <ul style="list-style-type: none">• Bike/Pedestrian safety classes for students• Traffic education and enforcement near schools• Public awareness campaigns for press and community leaders• Sidewalk Improvements (within 2 miles of school)• Traffic calming and speed reduction improvements• Bike/Pedestrian Crossing Improvements• On- and Off-Street Bike/Pedestrian Improvements• Bicycle Parking• Traffic diversion, education, and enforcement
Maryland Highway Safety Office Grant (MVA)	<p>This federally funded grant aims to reduce the number of motor vehicle-related crashes, deaths, and injuries on Maryland highways. The State's Strategic Highway Safety Plan is a data-driven plan that identifies the top safety priorities that are eligible for funding. Since 2014, pedestrian safety is a top safety priority.</p> <p><i>Eligible Grantees:</i></p> <ul style="list-style-type: none">• State Agencies• Local/County Jurisdictions• Law Enforcement Agencies• Non-Profit Organizations• Higher Education Institutions <p><i>Eligible Bike/Pedestrian Projects:</i></p> <ul style="list-style-type: none">• Pedestrian Safety Projects Consistent with SHSP Strategies



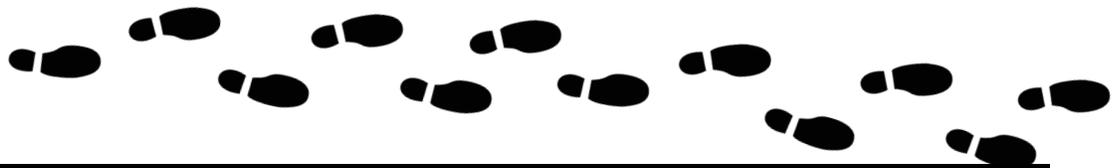
The grants listed in Table 8-7 (State Funding Programs) are State Highway Administration dedicated funding programs that support bicycle and pedestrian improvements on state roads. SHA internally identifies, designs, and constructs many of the projects. Local communities can identify and request projects for SHA evaluation.

Table 8-7: State Funding Programs

Program	Description
ADA Retrofit (SHA Fund 33)	A fund to upgrade existing sidewalks, curb ramps, intersections and driveway entrances along state roadways to be compliant with the Americans with Disabilities Act (ADA).
Sidewalk Retrofit (SHA Fund 79)	A fund to construct missing sidewalk segments along state roadways to fill gaps within the pedestrian network. The missing segment must be located in an Urban Area (as defined by the Census). Local matching fund contributions may be reduced or eliminated for projects located in Designated Sustainable Communities, in a Priority Funding Area, or where SHA determines that there is a substantial public safety risk or significant impediment to pedestrian access.
Community Safety and Enhancement Program (SHA Fund 84)	A fund for highway reconstruction and improvements along SHA roadways within urban centers that promote safety and economic development. Projects often include pedestrian and bicycle accommodations and are generally requested by local jurisdictions in the annual transportation priority letter sent to MDOT.
Bicycle Retrofit (SHA Fund 88)	This is a fund to provide bicycle improvements along state roadways.
Bicycle Pedestrian Planning Area	While not direct funding, this program provides technical assistance in planning for a specified small area where bicycle and pedestrian activities will be prioritized.

Table 8-8: Additional State Grant Opportunities

Program	Description
Community Legacy Program (DHCD)	The program provides local governments and community development organizations with funding for essential projects aimed at strengthening communities through activities such as business retention and attraction, encouraging homeownership, and commercial revitalization. Projects must be located within an approved Sustainable Community to be eligible for funding. Bicycle and pedestrian improvements include, but are not limited to, streetscape improvements along streets that are generally not state highways; development of mixed-use projects that may combine housing, retail, office, and public and open space; and development of public infrastructure that is related to a



	Community Legacy project (such as parking, lighting, and improvements to pedestrian and bicycle circulation).
Program Open Space (DNR)	The program consists of two components, a local grant component often called Localside POS and a component that funds land acquisition and recreation facility development. The Localside component provides financial and technical assistance to local subdivisions for the planning, acquisition, and/or development of recreation land or open space areas.
Community Parks and Playgrounds (DNR)	<p>The program provides funding to restore existing parks and create new park and green space systems in Maryland's cities and towns. Flexible grants are provided to local governments which help them rehabilitate, expand, or improve existing parks. Funding can help develop environmentally oriented parks and recreation projects, create new parks, or purchase and install playground equipment in older neighborhoods and intensely developed areas throughout the state. Projects are funded 100%; no matching funds are needed.</p> <p><i>Eligible Grantees:</i></p> <ul style="list-style-type: none"> • Municipalities
Maryland Heritage Areas Financial Assistance Programs (MHT)	Designated Maryland Heritage Areas are eligible for various tax credits, grants, and loans. These financial assistance programs support a wide variety of historic preservation-related activities. Bicycle and pedestrian opportunities involve inclusion in heritage tourism development and educational programs.
Complete Streets Program Funding (MDOT)	The Complete Streets Program is a competitive grant program within the Maryland Department of Transportation (MDOT). Funds for the program must be as provided by the Governor in the State budget. Local governments that develop complete streets policies and are certified by MDOT may apply for grants from the program to finance the design and planning of eligible projects.



Table 8-9: Additional Federal Grant Opportunities

Program	Description
Transportation Investment Generating Economic Recover (TIGER) Grants (USDOT)	The TIGER Discretionary Grant program provides a unique opportunity for the USDOT to invest in road, rail, transit, and port projects that promise to achieve critical national objectives. The TIGER program enables DOT to examine a broad array of projects on their merits to help ensure that taxpayers are getting the highest value for every dollar invested. In each round of TIGER, DOT receives many applications to build and repair critical pieces of our freight and passenger transportation networks. Applicants must detail the benefits their project would deliver for five long-term outcomes: safety, economic competitiveness, state of good repair, livability, and environmental sustainability.
Rivers, Trails, and Conservation Assistance Program (NPS)	The program extends and expands the benefits of the National Park Service by helping connect all Americans to their parks, trails, rivers, and other special places. When a community asks for assistance with a project, NPS staff provides free, on-location facilitation and planning expertise from conception to completion. Assistance can include visioning and planning; developing concept plans for trails, parks, and natural areas; setting priorities; and identifying funding sources.
Federal Lands Access Program (FHWA)	The program is intended to improve transportation facilities that provide access to, are adjacent to, or are located within, federal lands. The program supplements state and local resources for public roads, transit systems, and other transportation facilities, with an emphasis on high-use recreation sites and economic generators. Bicycle and pedestrian opportunities include planning, design and engineering, construction, rehabilitation, and preventative maintenance of facilities accessing public lands.



There are a variety of other public and private grant opportunities available to fund bicycle and pedestrian projects. Specifying project type is the first step to determining funding eligibility. Several examples are included below.

Table 8-10: Additional Private Grant Opportunities

Program	Description
Robert Wood Johnson Foundation	The Robert Wood Johnson Foundation invests in grantees (e.g., public agencies, universities, and public charities) that are working to improve the health of all Americans. Current or past projects in the topic area “walking and biking” include greenway plans, trail projects, advocacy initiatives, and policy development.
PeopleForBikes	The PeopleForBikes Community Grant Program provides funding for important and influential projects that leverage federal funding and build momentum for bicycling in communities across the U.S. These projects include bike paths and rail trails, as well as mountain bike trails, bike parks, BMX facilities, and large-scale bicycle advocacy initiatives.
National Center for Safe Routes to School	The National Center for Safe Routes to School (part of the UNC Highway Safety Research Center) identifies ways for communities to solicit non-government funding for Safe Routes to School activities. The multiple benefits of SRTS programs, including the safety, health, environment and community impacts, often align with the interests of the local community. The National Center develops resources, provides technical assistance, and conducts marketing and program evaluations for the federal Safe Routes to School program.
Rails-to-Trails Conservancy	Rails-to-Trails Conservancy does not directly fund the development of trails. However, they provide technical assistance on the various funding programs available, from federal, state, and local funding mechanisms, to grants, partnerships and creative funding methods.
Heart of the Civil War Heritage Area (HCWHA)	The Heart of the Civil War Heritage Area provides mini grants to assist heritage sites, non-profit organizations and government units to develop new and innovative programs, exhibits, tours, events and other initiatives, and to enhance existing heritage tourism products. The goal is to promote stewardship of our historic, cultural, and natural Civil War resources, and stimulate tourism, economic prosperity, and educational development.



Opportunity for Construction: Challenges and Solutions

It is important to address the challenges of building pedestrian and bicycle infrastructure in Carroll County. Challenges discussed in this section are acquiring land; liability; maintenance; natural obstacles, including floodplains, steep slopes and streams; NIMBYism (not in my back yard); policy; safety; roads; and railroad and utility corridors.

Land Acquisition

A majority (75%) of County public roads do not have a dedicated right-of-way.ⁱⁱⁱ This presents a challenge when implementing bicycle and pedestrian infrastructure along County public roads, as many infrastructure designs identified in Chapter 7 suggest using a road right-of-way, apart from the motorist lanes. Land acquisition can add additional cost to the project and can be very time intense as there is a need to negotiate with private property owners.

The Carroll County Department of Recreation and Parks has experience with acquiring land for park and trail projects. The majority of land acquired is from large properties. Small amounts of land can be acquired for short distance connections, however, they find that this rarely happens. Some past Recreation and Parks projects that have required land acquisition are:

- Leister Park, Hampstead – the farm was purchased by Recreation and Parks for a low rate with the family’s condition that the property would be used as open space
- Krimgold Park, Woodbine – similar to Leister Park land acquisition
- Deer Park Rd Park Extension, Westminster – a parcel of land was purchased from the Archdiocese of Baltimore; the land is contiguous with the existing Deer Park Rd Park

Maintenance

Maintenance is an important discussion point for bike-ped implementation. It speaks to the efficacy of transportation infrastructure and could become a safety issue if not provided correctly. Maintenance is also a major cost concern for the County.

Generally, unpaved trails are maintained by the Department of Recreation and Parks. Paved trails are maintained by Carroll County Bureau of Facilities (under the Department of Public Works).

Bicycle lanes need to be kept free of debris. Debris could cause a cyclist to swerve in order to avoid it. Barrier-separated bike lanes, while safer for the cyclists, are more challenging to maintain, e.g., snow and debris removal, due to their separated nature. A separate sweep would be required in addition to a sweep of the road. If a solution cannot be found for cost-effective maintenance, at minimum, buffer-separated lanes should be required on high speed roads. Existing bike lanes in the County are maintained by the state as they only exist on state roads.



Carroll County has a Sidewalk Ordinance that places the maintenance of the sidewalk on to the property owner (including snow/ice removal); this applies when sidewalk is located within the public road right-of-way. This is something to bring to the attention of property owners should sidewalk be installed on their property.

All public trail maintenance is provided through the County, excluding trails in the municipalities. A trail generally needs to be maintained a certain way depending on whether it is paved or unpaved. Unpaved trails are maintained only when needed, such as a fallen tree, a wash out, etc. Paved trails are generally repaved or resurfaced every 15 years. In addition to scheduled maintenance, there are times when unexpected maintenance is necessary, such as after a washout from heavy rain or tree roots growing up through the pavement.

Volunteer maintenance is rare for trails in the County; however, it is something that needs to be explored more. When connecting to a neighborhood, members of that community and adjacent communities who seek to enjoy the trail should be consulted to assist in maintaining it. Trail Councils can also be formed for the sole purpose of finding creative ways to keep trails maintained; e.g., Boy Scout and Girl Scout troops, high school volunteer hours, neighborhood groups, etc.

It is important to have a plan to continue repair of existing trails in the County and then create a plan to repair any new trails. The County's Park Restoration fund provides ongoing funding for the renovation of County park sites due to age and deterioration. Typical projects include general building repairs, asphalt trail overlays, fence replacements, etc. A list of projects and the monetary amount requested is found in the annual CIP.

Floodplains

Ideally, floodplains would remain in a natural, vegetated condition. However, trails are often built along streams because of the attractive natural landscape enjoyed by pedestrians and bicyclists alike. If trails are to be constructed, it is best to build trails at grade in floodplains to maintain the natural drainage pattern, and limit erosion, surface saturation, and frequent inundation. However, the areas adjacent to streams are prone to unavoidable flooding, which can demand costly maintenance from fallen or hazardous trees, erosion, washed-out trails, etc.

The goal is to limit disturbance to vegetation when building in a floodplain. This can be accomplished by building as narrow and natural as possible, while still meeting the minimum grant funding and ADA requirements, and studying the corridor to identify and avoid sensitive areas. All trail development in floodplains must comply with the County Code. Carroll County has been consistent in limiting development in its 100-year flood areas.



Working Within Existing ROW and Easements

Some of the trails mentioned in previous chapters include railroad crossings. These infrastructures will likely cross railroad tracks at grade. All but one of these trails is either listed as an “Adopted/Planned” or “Future Connection. The “Under Construction” State Highway Administration shared-use-path along MD 27 will cross over the Maryland Midland Railroad, at grade, using the existing Hahn Road right-of-way.

Trails may also be built along former rail lines. This is a way to make use of abandoned railroad right-of-ways to create safe connections and form continuous bicycle-pedestrian networks. The County’s only existing rail-trail is in Mount Airy. The Town was able to utilize the abandoned B&O right-of-way that traverses east to west through Town. Previous chapters mention some trails that may use portions of abandoned rail lines in the County.

An emerging concept to secure even more land for effective trail development is rails-with-trails, which are trails adjacent to, or within, an active railroad corridor. Often times in this case, a use easement is purchased from the railroad company. As of 2018, there are nearly 350 rails-with-trails within the US, totaling more than 930 miles.

Sometime railroads have established policies about bike-ped infrastructure within the railroad’s right-of-way. For example, CSX is not in favor of new bike-ped infrastructure crossing at locations outside of existing highway easements. Here are the key points of the CSX document, *Public Project Information for Construction and Improvement Projects That May Involve the Railroad*:

- “Private or public parallel bicycle/pedestrian pathways and trails are not permitted on CSXT property.
- CSXT prefers grade separated bicycle/pedestrian pathways and multi-use trails.
- Bicycle/pedestrian pathways and trails cannot cross tracks at grade outside of existing highway easements.
- Pedestrian safety is enhanced when pathways and sidewalks are designed such that they cross the tracks at as close to a right angle as practical.
- The highway agency’s design must include additional safety measures for at-grade pathways and trails within existing highway easements. These measures should include detectable warnings. Pathways and trails greater than 5’ in width require either physical requirements or traffic control devices.
- CSXT will oppose condemnation proceedings aimed at recreational use of trackside property.
- New crossings, if approved, shall be maintained at the appropriate agency’s expense.”^{iv}

While utility and railroad companies often place constraints on implementing bicycle and pedestrian projects there are strategies for success. Use an existing public road right-of-way or easement when crossing a utility or railroad line. For best chance of success it is important to communicate early and often with these companies.



It is important to consult each railroad right-of-way owner as early as possible in the project planning process to determine the constraints of the project. Involving the Rails-to-Trails Conservancy may be of benefit as they have experience with over 31,000 miles of trails, including railroad corridors.

There is also an opportunity to work with utility companies utilizing their existing easements. BGE and Pepco are aware of the desire of bike-ped advocates to utilize these spaces. Pepco/Exelon Corporation and Montgomery County have partnered to implement that County's first utility line corridor trail. The 6-mile trail, plus 13 additional miles to be built later, is a pilot project between the two partners.

Some "Adopted/Planned" and "Future Connection" trails mentioned in previous chapters will cross under utility lines using existing road right-of-ways, or an easement may need to be obtained from the utility company. No trails are planned to fully utilize a utility line corridor, however, the current mapped trails are planning-level alignments, which could be modified once more detailed planning and engineering are completed. In addition, there is potential to utilize these corridors through partnerships.

Using existing public road right-of-ways is another option for building bike-ped infrastructure. While much of the County's older roads do not have additional right-of-way outside of the road itself, state and newer County roads are constructed with right-of-way that extends past the paved road. Building bike-ped facilities within an existing right-of-way can create safety issues, which are addressed in Chapter 7: Design Alternatives. However, having an existing public right-of-way area to work in will eliminate the need and cost of acquiring privately owned land.

Legal Challenges

People without access to vehicular travel will often bike and walk along roads to reach destinations such as schools, jobs, shopping, transit, as well as for exercise and recreation. Quite often, these trips are made in the absence of bicycle and pedestrian facilities, as these infrastructure improvements are very limited throughout many parts of the County. Questions have been raised as to whether or not the County would expose itself to liability risks by encouraging bicycling and walking along and across roads.

Whether bike-ped facilities are provided, or not, liability cannot be avoided. However, not providing the infrastructure, including signage, places the County at greater risk. To minimize liability risk, infrastructure needs to be provided that is designed and constructed in accordance with federal and state design standards. Providing bike-ped infrastructure that complies with recognized standards protects the County from liability.

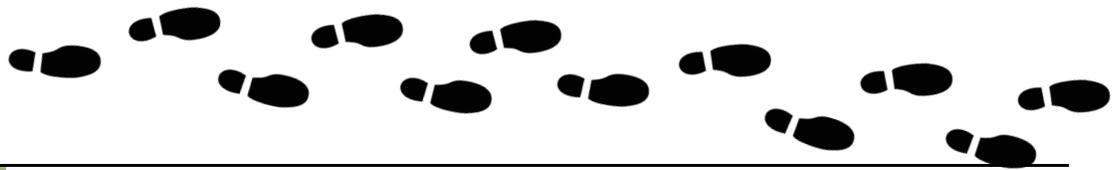
Another concern is notification of problems or concerns. If the County is notified of a problem or unsafe conditions, but does nothing to address the issue, it may have created greater exposure to liability. A better approach would be for the County to establish a policy or program to address issues and plan for needed bike-ped infrastructure and future



maintenance. With such a policy or program in place, the courts tend to recognize in a lawsuit that the local jurisdiction is moving forward to address the problem, thereby providing a level of protection from potential legal issues.

Table 8-11: Carroll County Challenges to Implementation and Solutions

Challenge	Solution
Land Acquisition	<ul style="list-style-type: none"> • Negotiate with landowners to acquire property or establish easement/right-of-way • Grant opportunities are through Recreational Trails Program (SHA), Program Open Space (DNR)
Legal Issues	<ul style="list-style-type: none"> • Adhere to local, state, and federal laws and regulation • Establish a policy or program to address issues and plan for needed bike-ped infrastructure and future maintenance • Implement infrastructure in accordance with federal and state design standards • Building infrastructure won't increase the risk of liability
Maintenance	<ul style="list-style-type: none"> • Involve volunteers - friends groups and recreation councils • Clearly communicate a protocol between County roads maintenance officials and State Highway Administration officials • Identify dedicated funding for ongoing maintenance of pavement markings and signage, bike parking facilities, and County Trails
Natural Obstacles	<ul style="list-style-type: none"> • Conduct a thorough investigation of the proposed bike-ped corridor • Seek implementation of trails where there are existing bridges over rivers and streams • Provide a priority list of grade-separated crossing that can be pursued as major funding opportunities become available
Public Opposition	<ul style="list-style-type: none"> • Provide information and answer criticism • Be open and transparent • Seek out supporters and urge them to get involved in the project • Create a citizen's bicycle and pedestrian advisory group
Policy	<ul style="list-style-type: none"> • Development of a countywide Complete Streets Policy with design guidelines • Include elements related to bicycle and pedestrian movements and other relevant multi-modal topics in the scope of transportation studies and feasibility studies related to existing or new public transportation



	<p>services or systems</p> <ul style="list-style-type: none">• Establish a policy or program to address issues and plan for needed bike-ped infrastructure and future maintenance
Railroads	<ul style="list-style-type: none">• Coordinate with the Rails-to-Trails Conservancy to serve as a legal advocate for rail-trails• Collaborate with railroad companies to create a rail-trail pilot program• Communicate early and often• Use existing right-of-ways and easements to cross railroad corridors
Safety	<ul style="list-style-type: none">• Complete the County Strategic Highway Safety Plan• Create a public outreach campaign• Education and enforcement
State Roads	<ul style="list-style-type: none">• Work with MDOT SHA to identify gaps in the bike-ped network• Seek implementation of trails where there are existing grade separated crossings (bridges or underpasses) to avoid state roads• Provide a priority list of state road intersections that need bike-ped or other infrastructure for safe road crossings
Utility Corridors	<ul style="list-style-type: none">• Collaborate with BGE/Exelon Corporation to create a utility-trail pilot program• Communicate early and often• Use existing rights-of- ways and easements to cross utility corridors



Engagement

The success of this plan depends on how well all essential parties are engaged in the issues. There should be opportunities for locally-based, community-driven solutions designed for the long-term. This effort would require the engagement of a core group of people to assist with advising on bike-ped projects.

The five E's in all aspects of the planning process: Education, Encouragement, and Enforcement, along with Engineering and Evaluation. These areas have been identified by the federal government, the state of Maryland, and numerous cities as essential elements to a comprehensive approach to bike-ped planning. A sixth E has also been identified, Equity.

Table 8-12: The Six E's of Planning

Education	Education should involve training bicyclists, pedestrians, and motorists of safe practices when encountering bike-ped and other transportation infrastructure.
Engineering	Design and construction of a safe transportation network.
Encouragement	Promotion of bicycling and walking as a mode of transportation.
Enforcement	Enforcement is to take a balanced approach to improve the behaviors of bicyclists, pedestrians, and motorists.
Evaluation	Evaluation involves analysis of existing conditions, progress, and success of initiatives.
Equity	Ensure that bicycle and pedestrian initiatives benefit all demographics.

Public Participation

MDOT conducted a survey for its 20-year bike-ped plan to understand the demand for walking and biking in the state. Over 3,300 people participated in the survey. The results show there is a desire to walk and bike but there needed to be improvements. Some important findings are:

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



Updated in January 2019, the 2040 Bicycle and Pedestrian Master Plan surveyed the public for the most important initiatives and objects to move forward with this plan, and the results are as follows:

- Address key gaps and problems areas for bicycle and pedestrian connections (67% of respondents).
- Further develop multimodal transportation links and integration with transit (44% of respondents).
- Improve coordination between state agencies, MPOs, county and local jurisdictions, and advocates to support biking and walking (33% of respondents).^{vi}

Goal 2 of the 2001 Baltimore Region Bicycle, Pedestrian and Greenway Transportation Plan includes a policy that encourages the development of a citizen’s bicycle and pedestrian advisory group. Jurisdictions throughout the Baltimore Region are welcoming these advisory groups as a way for government and advocates to address their mutual interest in promoting a safe pedestrian and bicycle transportation system. Membership often consists of County/City employees and citizens of different educational and geographical backgrounds.

The Carroll County Bicycle-Pedestrian Master Plan Interest Surveys show that this is also true for those who bike and walk in Carroll County. Some results from the surveys are:

- 53% of survey respondents would walk more in Carroll County if sidewalk improvements were made such as widening and filling in missing gaps.
- Top improvement that would influence people to bike more often in Carroll include bicycle lanes, off-road paths, and paved shoulders (62%, 64%, and 50%).
- People would use bike-share if it were available at strategic locations around the County (46%).
- 65% of people said not feeling safe because of road conditions keeps them from riding a bike to destinations in the County more often.
- Respondents agreed that crossing roads safely and easily is most important when walking (37%)



Public Officials

The involvement of public officials in the bicycle and pedestrian planning process is essential to its success. Government executives and legislators play important roles in a plan's implementation. The more involved they are in the creation of the plan, the stronger the chances of implementation. An increased presence of people choosing to bike or walk to their destinations will require drivers to practice more awareness, and enforcement of a new road culture that respects infrastructure changes. Public officials have a major role in assisting in this process, as they are in positions of great influence. They are intricate in the process of shaping public perception, encouraging public participation, and assisting in public education.

Various tools may be used to engage public officials and the agencies they represent. This includes, but is not limited to, training videos, outreach, and safety assessments. Outreach is necessary to draw attention to the implications of officially creating new transportation alternatives. An increased presence of bicyclists and pedestrians will require a public consciousness of safety issues and behaviors. Outreach also encourages healthier lifestyle decisions as people become aware of reasonable options and alternatives. Additional training for law enforcement officers, who are in the field, will allow for a better understanding of bicycle and pedestrian needs. This can lead to better documentation of violations combined with improved reporting on bicycle and pedestrian accidents. Leadership from local elected officials is essential, as their support can ensure that activities are seen and understood by the public as "for the common good" of the community as a whole.

The Bicycle-Pedestrian Master Plan and municipal plans should be consulted during the review process for all of the types of projects listed below, to determine if bike-ped facilities are planned in the area and if they should be addressed. As early in the process as possible, the proposed project must be coordinated through the Department of Planning for consistency with the Bicycle-Pedestrian Master Plan. This will encourage communication between government agencies and entities, which has been deficient when it comes to bike-ped projects. Appropriate and efficient coordination will encourage more efficient use of funding for the following:

- State highway projects
- Projects that will be seeking transportation funding
- Site development or subdivision proposals
- Department of Recreation and Parks projects
- Bureau of Resource Management projects (e.g., stormwater management)
- Department of Public Works projects (e.g., local roadway improvement projects)
 - Road improvement projects (e.g., roadway repaving or restriping)
 - Utility-related projects that require road construction
 - Bridge replacement or reconstruction projects



Table 8-13: Public Agencies and Potential Input in the Planning Process

Agency	Input Needed
Board of County Commissioners	<ul style="list-style-type: none"> • County laws and policy that affect bicycle and pedestrian projects • Leadership
Carroll Hospital	<ul style="list-style-type: none"> • Common types of injuries • Infrastructure improvements that are preventive
Citizen Services	<ul style="list-style-type: none"> • Access for pedestrians who are aging or disabled • Design guidelines
Economic Development	<ul style="list-style-type: none"> • Tourism • Businesses
Emergency Services	<ul style="list-style-type: none"> • Encounters when responding to bike-ped collisions • Common types of injuries • Infrastructure improvements that are preventive
Health Department	<ul style="list-style-type: none"> • Education programs related to health and wellness
Historic Preservation Commission	<ul style="list-style-type: none"> • Connections and impact on historic structures
Public Works	<ul style="list-style-type: none"> • Engineering challenges • TrailBlazer connections
Recreation and Parks	<ul style="list-style-type: none"> • Current trail projects
Sheriff/Law Enforcement	<ul style="list-style-type: none"> • Enforcement of laws and safety guidelines • Recording and collecting appropriate data • Trainings
Maryland Department of Transportation (MDOT)	<ul style="list-style-type: none"> • County should engage this state agency in the challenges of state roads as barriers to walking and biking to County destinations • State Highway Administration (SHA)
State Legislature	<ul style="list-style-type: none"> • County/State laws that affect bicyclists and pedestrians • Clarifying terminology in laws



Strategies

Strategies may be used to engage stakeholders in the planning process. An objective in this plan is to encourage bicycling and walking to destinations in appropriate areas while improving conditions and infrastructure. However, preventive engineering measures do not necessarily increase biking and walking or preclude crashes which, as previously stated, result in higher fatalities in rural areas). If people habitually take cars and follow certain habits that don't consider bikers or pedestrians, then the transportation investments alone could be in vain. Therefore, it is important to combine implementation strategies and consider the 6 E's in those strategies.



Public Outreach Campaign

- Addresses 3 of the 6 E's – Encouragement, Education, and Enforcement
- Public outreach campaigns should focus on promoting public awareness, advertising safe practices and healthy lifestyles, and stress the importance of enforcement. There may be a larger campaign with multiple sub-campaigns that cater to various audiences. For example, an Enforcement Campaign may target law enforcement and assist in “identifying unsafe behaviors of drivers and pedestrians/bicyclists.”^{vii}
- The Pedestrian and Bicycle Information Center suggests including these campaign elements:
 - Defining Education-Related Problems and Goals
 - Targeting Specific Audiences
 - Relaying Important Messages
 - Measuring Program Effectiveness
 - Creating Viable Partnerships
 - Finding Program Support^{viii}
- Partner with government agencies, non-profits, and the public, and coordinate with existing community health improvement campaigns.
- Continuously evaluating the effectiveness of the education program will provide continued benefits from this investment.
- Education must be approached comprehensively. An effective education program would be supported by a partnership between government officials, county agencies, law enforcement, and community groups.



Bicycle and Pedestrian Safety Plan

- Addresses 3 of the 6 E's – Encouragement, Education, and Enforcement
- A Bicycle and Pedestrian Safety Plan is a strategy used by several U.S. jurisdictions to reduce fatalities and serious injuries. It is a more detailed analysis and examination of the safety issues surrounding biking and walking. It may include a detailed outreach strategy and details on how to engage citizens and other officials. The plan requires bringing together citizens, various public officials, and government employees from relevant agencies, such as those listed in **Error! Reference source not found..**
- How to Develop a Pedestrian Safety Action Plan (FHWA)^{ix}
 - Purpose: “A Pedestrian Safety Action Plan is a plan developed by community stakeholders that is intended to improve pedestrian safety in the community. An objective of the guide is to help state and local officials know where to begin to address pedestrian safety issues. It is also intended to assist agencies in further enhancing their existing pedestrian safety programs and activities, including identifying safety problems and selecting optimal solutions.”^x
 - Emphasis areas:
 - This plan is primarily a reference for improving pedestrian safety through street redesign and the use of engineering countermeasures, as well as other safety-related treatments and programs that involve the whole community.
 - There should be separate pedestrian and bicycle advisory boards so that the pedestrian board can focus solely on pedestrian issues. If this is not feasible, measures need to be implemented to ensure that both pedestrian and bicycle modes get equal attention (FHWA, p. 22)
- Use the Florida Pedestrian and Bicycle Strategic Safety Plan as a model^{xi}
 - To improve the overall safety of pedestrians and bicyclists by reducing pedestrian- and bicycle-related crashes, injuries, and fatalities while ensuring that all areas of Florida's transportation system provide safe and accessible travel options for pedestrians and bicyclists.
 - Emphasis areas:
 - Data, Analysis, and Evaluation
 - Driver Education and Licensing
 - Highway and Traffic Engineering
 - Law Enforcement and Emergency Services
 - Communication Program
 - Outreach Program
 - Legislation, Regulation, and Policy
 - Safe and Accessible Pedestrian Facilities Inventory Model (SAPFIM)
 - GIS-driven program to survey and document pedestrian facilities along roadways
 - Used to coordinate/support policies such as Complete Streets, etc.

Design Guidelines

- Addresses 1 out of 6 E's – Engineering



- The creation of design guidelines will lead to more properly designed complete streets that will allow participants of all abilities and ages to feel safer as they walk and bike. It is important to engage engineers, citizens, and officials in addressing design that includes ADA compliance, maintenance, and new bicycle and pedestrian facilities. Complete Streets design and engineering standards reduce collisions and truly promote transportation uses other than vehicles.

These strategies will assist in making bicycle and pedestrian planning more effective. However, it is also important to re-evaluate programs and policies on a regular basis to be certain of their continued effectiveness.

GIS App Utilizing Crowdsourcing

Addresses 3 of the 6 E's – Encouragement, Evaluation and Engineering

- Crowdsourcing is the process of obtaining information, insight, and knowledge from user-generated data provided through web and mobile applications, often to address a specific issue or solve a problem.
- Crowdsourcing is strategic use of data by active transportation planners not only to increase data availability, but also to better understand location and time-based travel patterns and personal experience.
- Engaging stakeholders in the planning process in this capacity has benefits, such as broad and diverse perspectives, local knowledge, data timelines, and direct dialogue between planners and those affected by planning decisions.

Recommendations

- To coordinate planned bike-ped accommodations facilities with other projects, the Bicycle-Pedestrian Master Plan and municipal plans should be consulted during the review process for all projects that may require road-related construction, road-related improvements, or will be seeking transportation funds
- Create a Bicycle-Pedestrian Advisory Committee
 - Membership should include County officials, nonprofits, citizen representatives, and an even representation of bicyclists and pedestrians living in Carroll County
 - This advisory committee will give recommendations on development plans in relation to bicycle-pedestrian facilities
- Form friends groups and recreation councils to defer the costs of maintaining paved trails
- Consider utilizing Florida Department of Transportation's SAPFIM as a tool to inventory pedestrian infrastructure
- Consider a 10-year pedestrian census and bicycle census that runs with the federal Census and targets certain areas of high pedestrian and bicycle use
- Public awareness should be a high priority when any new bicycle infrastructure/markings are constructed near vehicular access points. The public should be notified in multiple ways, including the County website, the newspaper, temporary signage at the site, etc.
- Create a Bicycle-Pedestrian Design Guidelines document to aid in the development of bike-ped infrastructure
- Work with the municipalities to create a Complete Streets Policy that addresses bicycle and pedestrian transportation within growth areas



- Implement a Safety Campaign from partnerships between government agencies, health organizations, and citizens that addresses driver, bicycle, and pedestrian awareness
- Create a Road Safety Plan to guide the implementation of safe bike-ped infrastructure before and after it is built
- Determine, as early in the planning process as possible, how any existing private owner policies on right-of-ways (e.g., railroad policies) could affect the project
- Create an app that allows the public to see existing and under construction bike-ped facilities and routes
- Create an app that allows the public to alert users as to hazards and conditions of existing bike-ped infrastructure



Citations

ⁱ Bicycle-Pedestrian Master Plan Citizens Outreach Meeting on March 21, 2017

ⁱⁱ (Carroll County Government, 2014 Freedom Bicycle-Pedestrian Master Plan & Assessment 2014)

ⁱⁱⁱ Carroll County Department of Public Works

^{iv} CSX. *Public Project Information for Construction and Improvement Projects That May Involve the Railroad*.
<https://www.csx.com/index.cfm/library/files/about-us/property/public-project-manual/>

^v Maryland Department of Transportation. Maryland Twenty-Year Bicycle & Pedestrian Master Plan. January 2014.
http://www.remlinedigital.com/M5144%20MDOT%20Bicycle%20and%20Pedestrian%20Master%20Plan/links/bike_ped_plan/BikePed%20Booklet%202014-01-14.pdf

^{vi} Maryland Department of Transportation. 2040 Maryland Bicycle and Pedestrian Master Plan 2019 Update. January 2019.

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^{vii} Pedestrian and Bicycle Information Center. *Implementing Enforcement Campaigns*.

http://www.pedbikeinfo.org/programs/enforcement_campaigns.cfm

^{viii} Pedestrian and Bicycle Information Center. *Education Campaigns*.

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^{ix} Federal Highway Administration. *How to Develop a Pedestrian Safety Action Plan*. Pedestrian and Bicycle Information Center. February 2006. http://safety.fhwa.dot.gov/ped_bike/ped_focus/docs/fhwasa0512.pdf

^x Federal Highway Administration. *How to Develop a Pedestrian Safety Action Plan*. Pedestrian and Bicycle Information Center. February 2006. p. 1. http://safety.fhwa.dot.gov/ped_bike/ped_focus/docs/fhwasa0512.pdf

^{xi} Florida Department of Transportation. *Florida Pedestrian and Bicycle Strategic Safety Plan; Safety Doesn't Happen by Accident*. The Center for Urban Transportation Research University of South Florida. February 2013.
<http://www.dot.state.fl.us/safety/6-Resources/FloridaPedestrianandBicycleStrategicSafetyPlan.pdf>