



CITY OF MILFORD

WALK IT – BIKE IT – SHARE IT



Bicycle & Pedestrian Master Plan | Gary Norris, AICP

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I. INTRODUCTION AND PURPOSE

The purpose of the City of Milford's Bicycle & Pedestrian Master Plan is to provide the city with a strong planning tool that will facilitate the continued and orderly development of bicycle and pedestrian facilities and implementation strategies that encourage their use. Any pedestrian and bicycle facility should address the needs of all ability, age and skill levels, goals and objectives, an implementation plan, and suggested approaches to bicycling and pedestrian safety education. In addition the City of Milford's Comprehensive Plan was adopted in 2008, and its citizens and leadership crafted a Vision, which speaks to the desire for creating a more livable community through walking and biking.

The Importance of Walking and Bicycling

Walking and bicycling are critical to the community's health and livability. Walking and bicycling provide important transportation and recreation options. Pedestrian facilities (such as sidewalks, paths or trails) and bicycle facilities (such as bicycle lanes or paths) weave people into the fabric of their communities. Schools, parks, transit, downtown and commercial areas, community centers and senior centers, libraries, recreation facilities, health services, and employment facilities – connections to these places are necessary for the survival and well-being of society.

Almost everyone is a pedestrian at some point during the day, even if it is just a walk from the car to the front door. Many people, including children, the elderly, and

the economically disadvantaged, rely on walking to reach their schools, jobs, recreational areas or basic services. Walking and bicycling facilities can provide safer ways to get around, by separating people from vehicle traffic. They also provide public space for social interactions between neighbors, and especially in the case of trails, a respite from everyday life and the chance to spend time alone or with family members or friends. Walking and bicycling provide an opportunity to lessen the influence of the automobile in a community and offers the opportunity to reduce daily impact on air and water resources. Walking is one of the most common recreational activities in the City of Milford. Walkways, bikeways, and trails such as the Riverwalk encourage healthy lifestyles by offering people a place to walk or bicycle. Walking and bicycling have many benefits and can enhance quality of life.

Governmental programs such as the Intermodal Surface Transportation Efficiency Act (ISTEA) passed by Congress in 1991, established a revolutionary transportation policy to create an integrated, intermodal system that provides people with travel choices. ISTEA recognizes the important role of bicycling and walking and required the consideration of non-motorized users in planning and developing transportation projects and programs. Also ISTEA included new opportunities for funding bicycling and pedestrian improvements.

In 1998, the Transportation Equity Act for the 21st Century (TEA-21) further integrated pedestrian and bicycle considerations into the overall transportation planning process. TEA-21 requires that safe

accommodation of non-motorized users be considered in all state and regional transportation plans and in the development and construction of all Federal-aid transportation projects.

In addition, with the passage of the 2009 Complete Streets Act for the State of Delaware, complete streets will enable safe access for all users, including pedestrians, bicyclists, motorists and public transit users of all ages and abilities. Complete streets incorporate a variety of pedestrian-, bicycle-, and transit-friendly features like sidewalks, medians, raised crosswalks, bike lanes and special bus lanes, all designed within the context of the community. Complete streets policies ensures that transportation agencies routinely design and operate the entire right of way to enable safe access for all users.

The Center for Disease Control and Prevention (CDC) reports that there is an epidemic regarding our children and an obesity problem. The CDC's comprehensive recommendations include not only healthy eating but active lifestyles which include more walking and such activities as biking to school, provide there is the presence of sidewalks, safe street crossings and reduced vehicle speeds in school zones that will enable more children to walk and bike to school.

In addition to promoting children's health, complete streets benefit communities in a variety of ways including:

- Increasing the capacity of the transportation network and reducing congestion
- Reducing automobile trips
- Fostering stronger communities

The City of Milford's Comprehensive Plan was adopted in 2008, and its citizens and leadership crafted a Vision, which speaks to the desire for creating a more livable community through walking and biking.

II. EXISTING CONDITIONS

Existing Bicycle Facilities

Purpose

The purpose of this section is to present a comprehensive picture of the existing bicycle facilities within the City of Milford to help guide policymaking, and the PED/Bicycle Advisory Committee regarding the selection and prioritization of future bicycle improvements. Typically the existing conditions data comes from four key sources: a survey of existing street conditions, the Journey to Work data from the most recent Census, bicycle collision data, and community outreach.

Content

- The number of existing bicycle commuters in the plan area
- A map and description of existing bikeways, end-of-trip bicycle parking facilities, intermodal connections and parking facilities, and facilities for changing and storing clothes and equipment.
- A map and description of existing land use patterns (Highlight major bicycle trip generators and attractors)
- Available bicycle count data.

- Current bicycle collision data
- Bicycle Level of Service Analysis
- Needs analysis

Based on the 2000 Census regarding Commuting to Work statistics, 1.3% of the workforce commuted to work on bicycles, and approximately 4.3% of the workforce walked to work.

Based on statistics supplied by the Delaware State Police the following chart shows the number of Bike Crashes with Vehicles and Pedestrian Crashes with Vehicles for the years 2007 through June of 2010.

<u>Year</u>	<u># of Bike Crashes With Vehicles</u>	<u># of Pedestrian Crashes With Vehicles</u>
2007	1	3
2008	1	0
2009	2	4
2010	2	3

Details of the data show one crash resulted in a pedestrian fatality if 2010 but no other deaths during the years. One of the primary goals of the Master PED/Bicycle Plan would be to reduce the number of crashes involving vehicles with bicycles and vehicles with pedestrians.

Currently there are three (3) existing bikeways marked by DelDOT. This is shown in **Figure 3**, Riverwalk and Future PED/Bicycle Paths. The Bicycle Paths are marked in a solid blue line and include the following streets, Marshall Street, Elks Lodge Road and Rehoboth Boulevard.

The Number 1 Bicycle Path includes the east side of Marshall Street from Elks Lodge Road northward to the Watergate development where it diminishes into the new pavement of Marshall Street. Currently there is no marking designating a bikeway from the Watergate development northward. The Marshall Street bikeway has a 5 foot paved shoulder, a speed limit of 35 mph for Marshall Street, and is marked for .3 miles.

The Number 2 Bicycle Path is Elks Lodge Road, which is marked on both sides of Elks Lodge Road. This bikeway is marked for 1.5 miles from Marshall Street to Wilkins Road and has a 5 foot paved bike lane with a 50 mph speed limit.

The third bikeway, Number 3, is both sides of Rehoboth Boulevard from Wilkins Road northward to the entrance of the residential development known as Meadows at Shawnee. At the entrance to Meadows at Shawnee this bikeway continues north to the entrance of Milford Academy and the Milford High School, but is currently not marked.

A problem also exists at Rehoboth Boulevard and the overpass at Delaware Route 1 where the overpass joins Rehoboth Boulevard. This is marked in a solid red line

and is designated as an Impediment to this Bicycle Path. This is where drivers going north have to merge left and there is confusion over the bike lane and what a biker should do. This bikeway has a paved 10 foot shoulder and is posted at 40 mph and 35 mph for the speed limit.

At present there are no parking facilities for bicycles at public places such as the Milford Library, intermodal connections such as the DART Stop at the WalMart, and there are no facilities for changing and storing clothes and equipment.

Marshall Street looking north



Marshall Street looking south





Elks Lodge Road looking north



Elks Lodge Road looking south



Rehoboth Boulevard looking north (all photos)

Rehoboth Boulevard looking north (all photos)





Rehoboth Boulevard looking south (all photos)



Rehoboth Boulevard looking south (all photos)

Figure 2 shows the major bicycle trip generators and attractors, which include City Hall, the Milford Public Library, the Milford Hospital, Recreational facilities, Public Schools both Elementary and Secondary, and Existing and Future Residential Developments. A majority of these trip generators are located in the Central part of the City according to **Figure 1**, which shows the Existing Centers of Population. Since a majority of the Population and a majority of trip generators are located in the Central part of the City the primary recommendation would be to encourage the use of bicycles in this area. See **Figure 4**.

Figure 3 again shows the existing Riverwalk in green and the recommended pedestrian and bicycle connectors from Lulu Ross Elementary School and Banneker Elementary School to the Riverwalk from the approved 2008 City of Milford Comprehensive Plan in purple. The straight blue markings show existing bike lanes and the dashed blue markings show Future Bicycle Paths using existing DelDOT paved shoulders, which will connect residential developments, both existing and future, in the southeast section of the City. This proposed trail will also connect schools and the Downtown area.

There are sidewalks located in the Central Core of the City of Milford and most outlying residential developments located near the Downtown which provide access to the commercial hub. New sidewalks are required when a development is proposed along existing and proposed State maintained roads as part of the Complete Streets Act.

In addition, the current Subdivision Ordinance for the City of Milford requires sidewalks for all developments and encourages walkways to recreational and commercial developments. This is found in Chapter 200, Subdivision of Land which states: "Sidewalks shall be required in all subdivisions in both sides of the street and Pedestrian walkways other than in streets may be required where deemed essential to provide for circulation or access to schools, playgrounds, shopping centers, transportation and other community facilities."

Bicycle Level of Service

Bicycle Level of Service (BLOS) and Bicycle Compatibility Index (BCI) are emerging national standards for quantifying the bike-friendliness of a roadway. While other "level-of-service" indices relate to traffic capacity, these measures indicate on-road bicyclist comfort level for specific roadway geometries and traffic conditions.

Roadways with a better (lower) score are more attractive (and usually safer) for cyclists.

Using the BLOS/PLOS Calculator Form developed by the Illinois League of Bicyclists the BLOS for the following streets are found below. The BLOS/PLOS uses the following characteristics in determining the Level of Service for bicycles: Through lanes, Width of outside lanes, Paved shoulder or bike lane, Bi-directional Traffic Volume in ADT, Posted Speed Limit, Percentage of Heavy Vehicles, FHWA's pavement condition rating, Percentage of road segment with occupied on-street parking, On-

street parking time limit, in minutes, and Does the bike lane go through a residential area?

Based on this criterion the streets have the following ratings.

Score	Level of Service
Marshall Street	BLOS: 3.31 C (2.21-3.50)
Elks Lodge Road	BLOS: 2.12 B (1.51-2.50)
Rehoboth Boulevard	BLOS:-0.2 A (below 1.5)

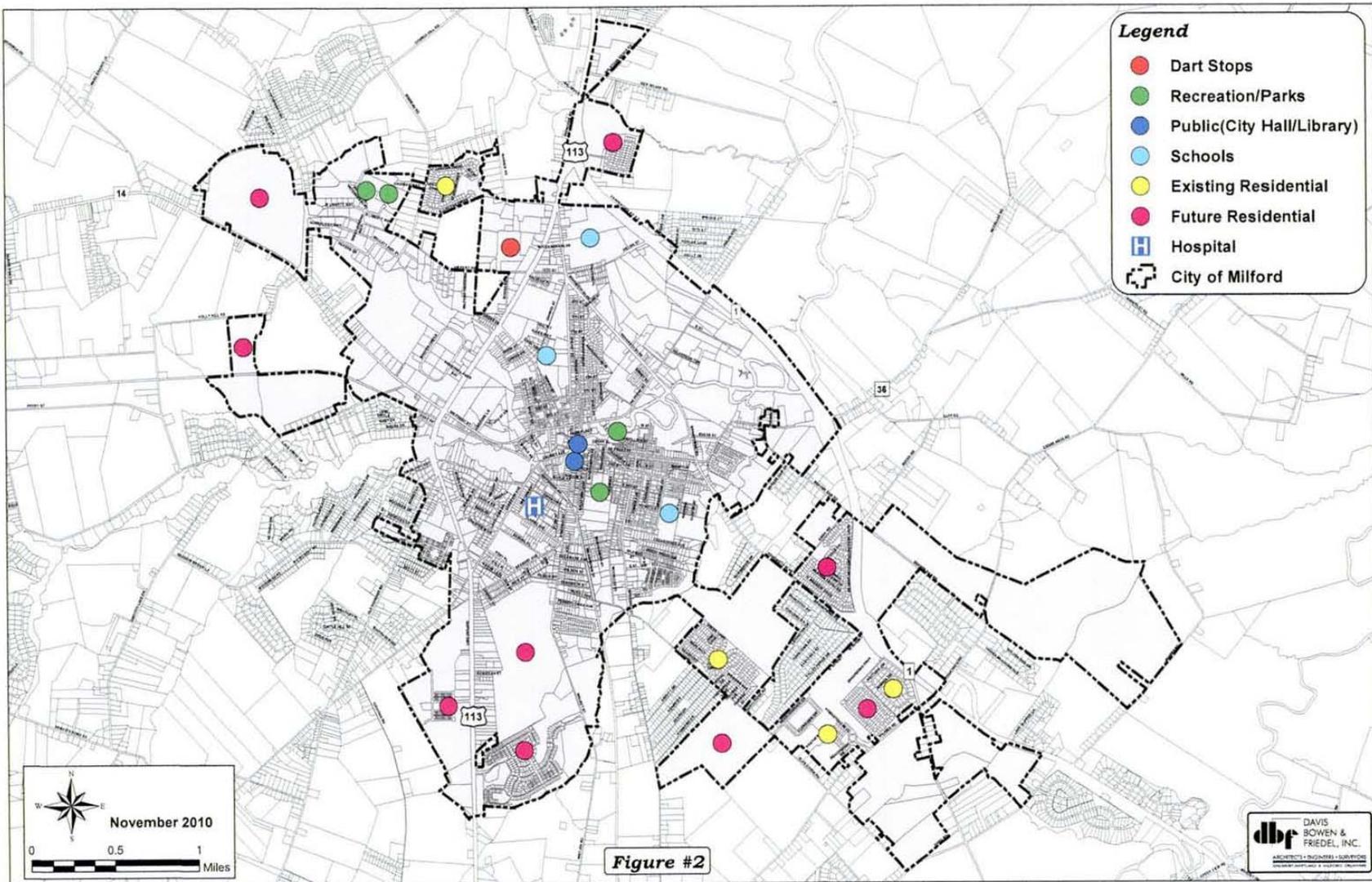
Marshall Street has BLOS rating of **C** which is average while Elk Lodge Road and Rehoboth Blvd. have a rating of **B** and **A** respectively, which is above average.

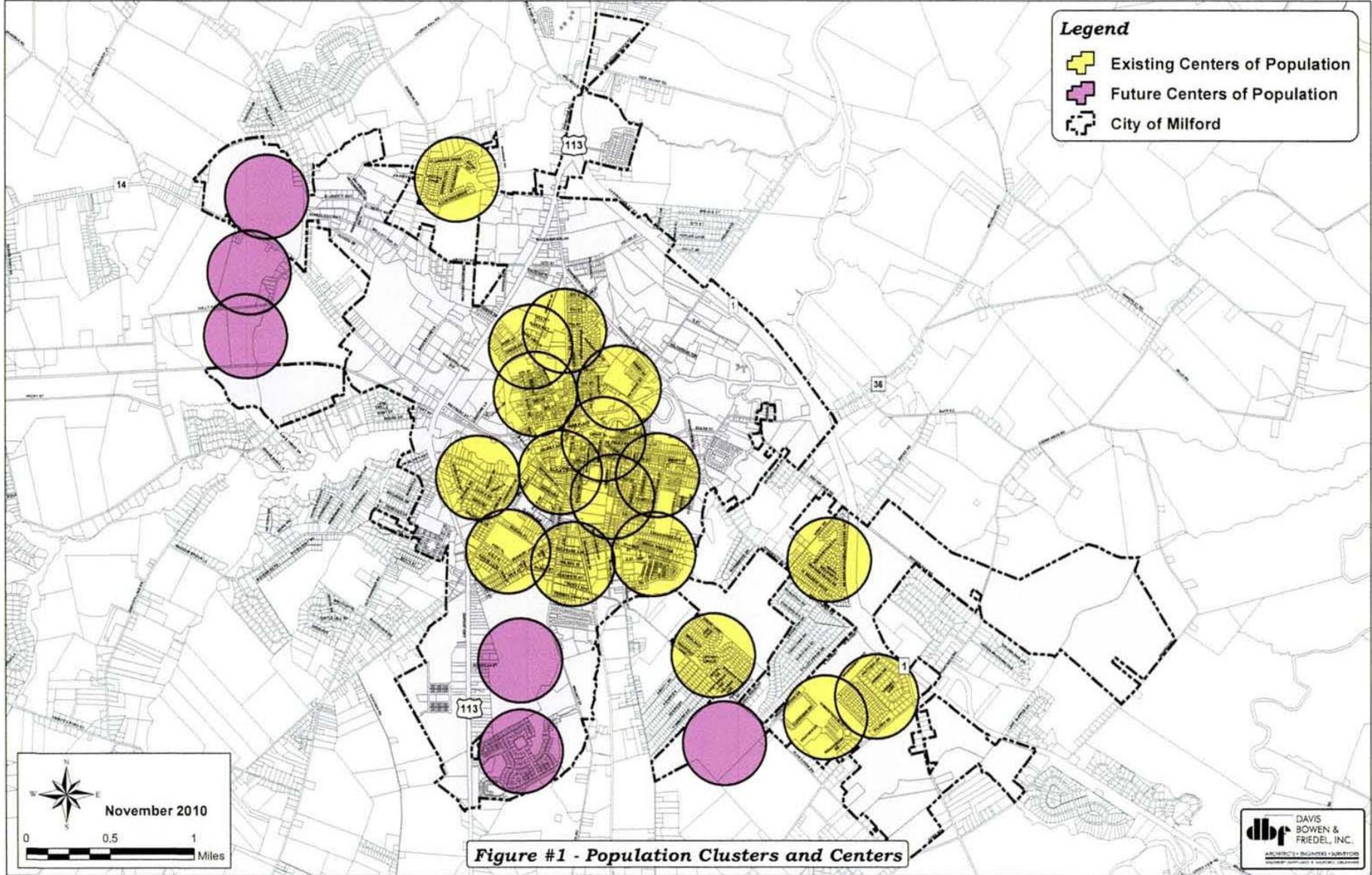
Needs Analysis

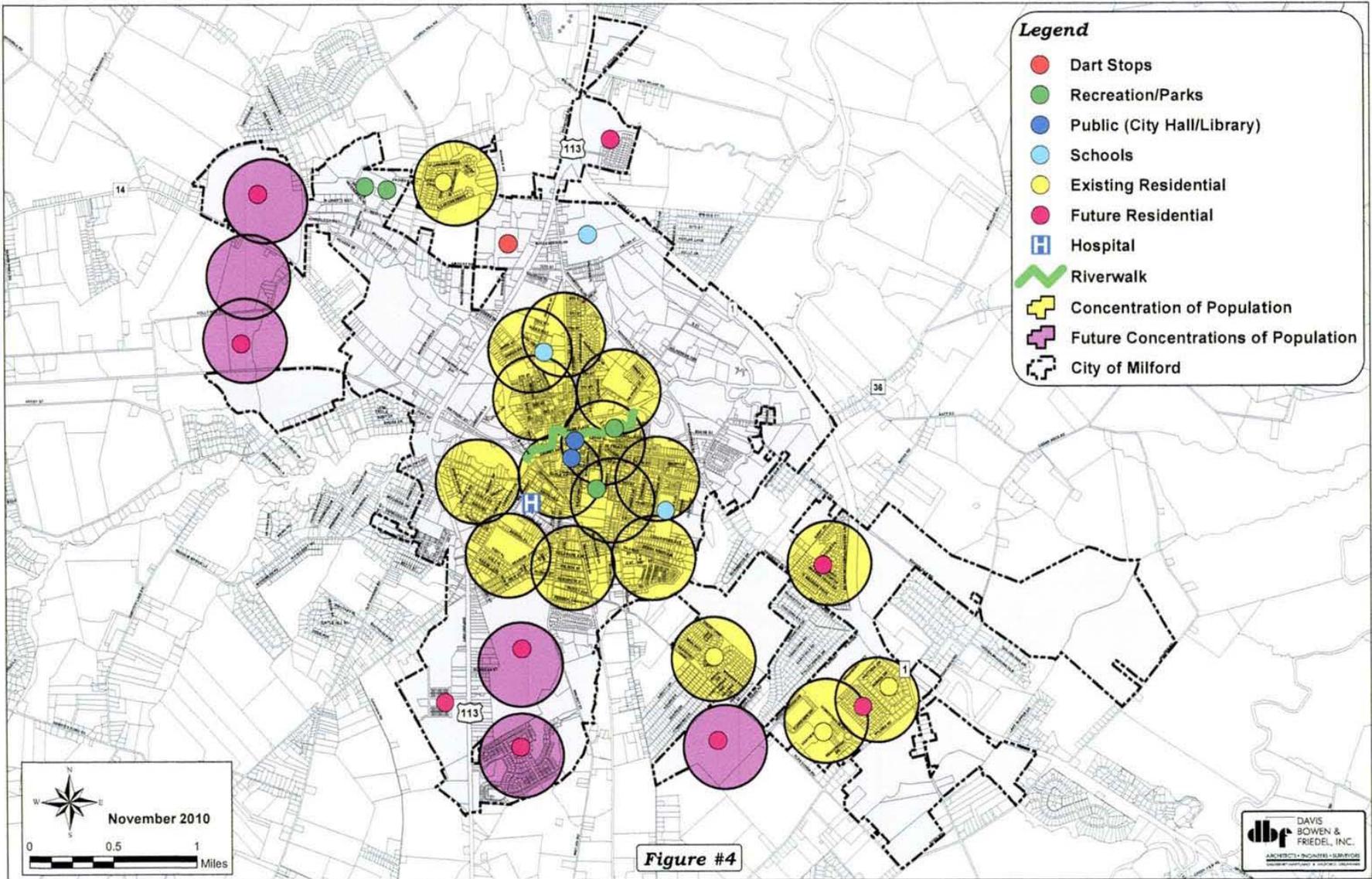
The purpose of reviewing the needs analysis of bicycle users is twofold: (1) It is instrumental when planning a system that must serve all user groups, and (2) it is useful when pursuing complete funding and attempting to quantify future usage and benefits to justify future expenditures of limited resources. During the past months there have been meetings with various groups including the PED/Bicycle Advisory Committee, the Milford Planning Commission, and individuals who commented on the planning of a pedestrian and bicycle master plan that incorporated all user groups.

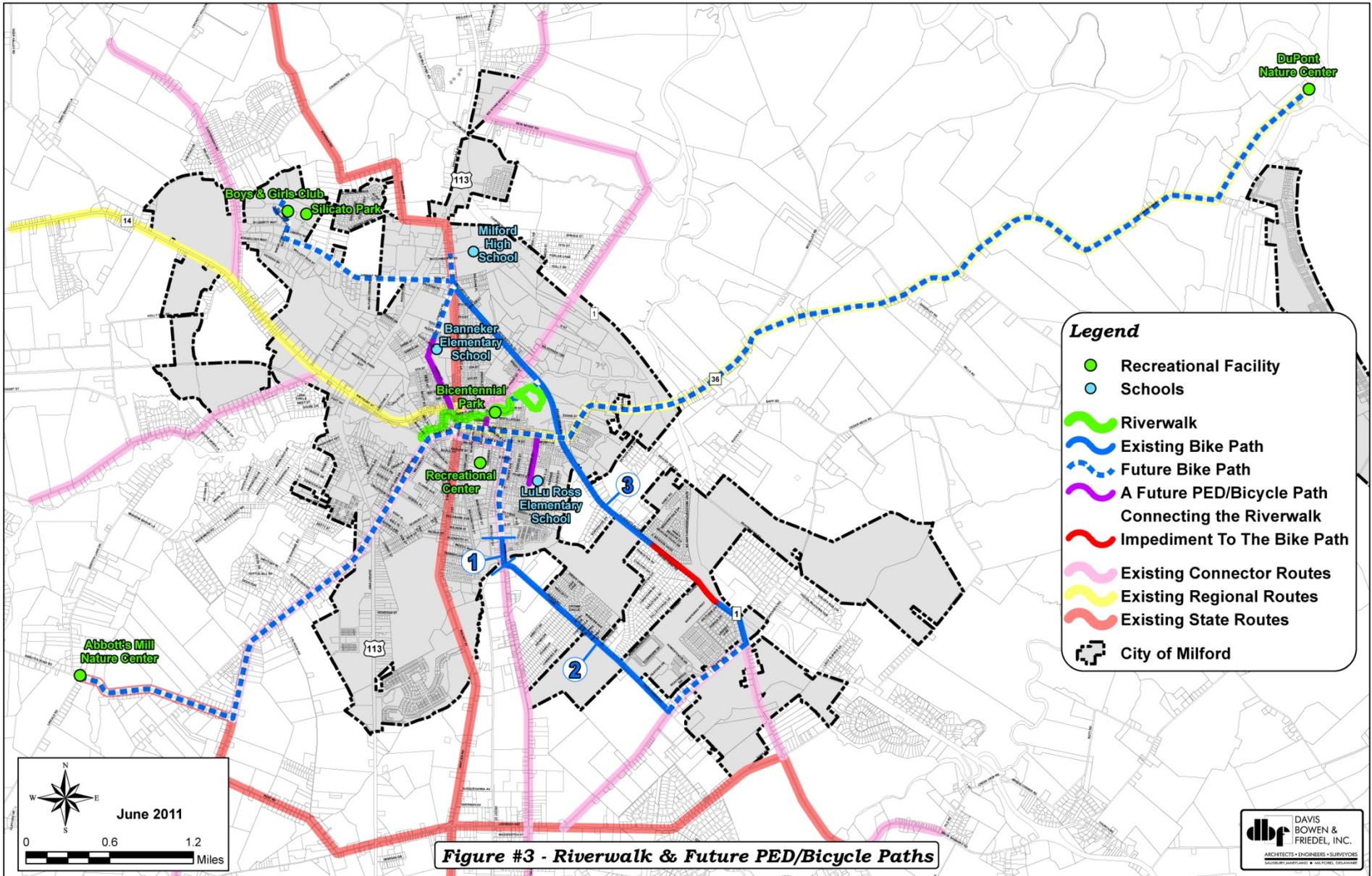
Preliminary findings include the following:

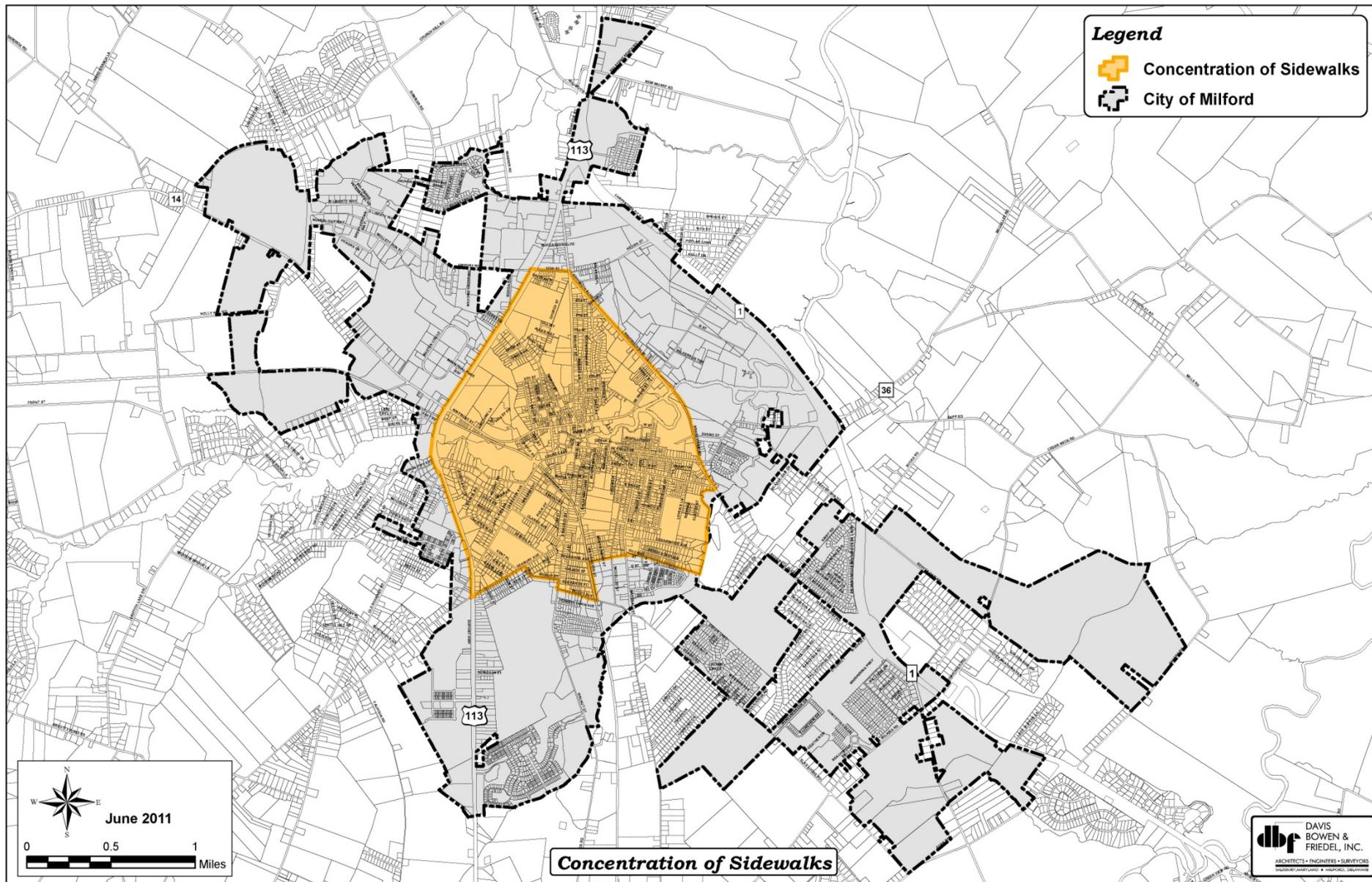
1. Connecting the Elementary Schools, Banneker and Lulu Ross with the Riverwalk in conjunction with the Safe Routes to School provisions.
2. Encourage more school children to walk or bike to these schools.
3. Marking of the paved shoulder on Rehoboth Blvd for bicycles.
4. Markings of the street for a Bicycle Path on Marshall Street.
5. Work with the Department of Transportation to develop a bicycle path on Wilkens Road.
6. Work with the Department of Transportation to develop a safe way to ride your bicycle on the north side of Rehoboth Blvd. in the vicinity of the Overpass from Route 1.
7. Work with the Department of Transportation to develop a safe crossing at Route 1 and Tenth Street/Airport Road.
8. Work on the development of a Bike Path along Airport Road from the intersection with Route 113 to the entrance to the Boys and Girls Club on Airport Road.
9. Work on the development of a Bike Path from the Abbott's Mill Nature Center, passing through the City of Milford, then on to the DuPont Nature Center located on the Delaware Bay.











III. BASIC PLANNING CONCEPTS

Centers of Population

Although population in the City of Milford is dispersed by urban standards, there are places within the community where population is concentrated at higher densities than in others. A visual impression of how the population is concentrated can be determined by drawing circles around neighborhoods that contain more than 50 housing units within a one-quarter mile radius. Each of these quarter mile circles is called a population cluster. If two or more of these clusters lie adjacent to each other, they represent a *population center* for planning purposes. See Figure 1. This Figure shows the existing Concentration of Population with yellow circles which is primarily located in the established part of the City with newer residential developments located in the Southeast section of the City and the northern part of the City. Purple circles show Future concentrations of Population in the eastern and southern parts of the City. These population centers represent a population density of between 50 to 70 dwelling units per acre.

Activity Centers

Places where people congregate, such as shopping centers, the Downtown Area, City Hall, Elementary, Middle and the High School, the Recreation Center, the Riverwalk, and the Milford Library are called *activity centers* (See Figure 2). These have been identified on a map by symbols. The shortest route between these activity centers and population centers tells us which are

the most desirable routes, all things being equal, for bicycle and pedestrian facilities, as well as roads.

Linkages

The purpose of the Master Plan is to link population centers with activity centers along the most direct routes possible, and in different ways, depending on whether people are walking or bicycling. A linkage is created when a facility, such as a paved shoulder, sidewalk, or recreation path, provides a clearly defined way for a bicyclist or a pedestrian to get from one destination to the next without encountering undue conflict with motorists.

User Groups

People traveling by different means often have different needs for a transportation system. Walkers need to be able to travel short distances over routes uncongested by moving vehicles, including bicycles. Bicyclists need smooth surfaces to travel on that aren't too steep, and don't bring them into conflict with trucks, buses, and cars. Moreover, people walk and bicycle for different reasons, and thus the kind of bicycling and walking that people do as well as where they are going are important factors in their choice of facilities. People who travel in the same way and for the same purpose are called a *user group*. The concept of the user group is essential in order to design and locate transportation facilities efficiently.

Bicycles

Three types of bicyclists are generally recognized in the planning literature.



Le Tour

group are adult bicyclists who have experience traveling in different kinds of traffic conditions. They prefer to ride in the travel lane of most roadways, are capable of traveling long distances, and operate according to the same rules of the road as govern any other vehicle using the public road system. Le Tour bicyclists travel at speeds averaging 12 to 25 mph, depending on weather and road conditions.

The Spare Tire

bicyclists are teens and adults who are less experienced than those in Le Tour Group. They are more numerous than the Le Tour bicyclists, but tend to travel shorter distances and at slower speeds. They may also need separate travel lanes such as paved shoulders and striped bicycle lanes to feel comfortable traveling on most roadways. For planning purposes, two miles is considered about the limit that The Spare Tire bicyclists will travel to reach a major activity center. The Spare Tire bicyclists tend to travel at speeds averaging 8 to 12 mph and usually do not ride during inclement weather.



The Kickstand

bicyclists are primarily children and young teens who are expected to have a low level of experience bicycling and perhaps poor judgment as to the rules of the road governing the operation of motor vehicles. They are likely to travel short distances and require very quiet streets or separate bike paths to operate their bicycles safely. The Kickstand bicyclists generally travel at speeds less than 10 miles per hour.



Typical Facilities

There are basically two types of facilities needed by bicyclists. One is the public road system, where bicyclists and motorists travel side by side on the same pavement surface. Under Delaware law, bicyclists are operating a vehicle and must obey the same rules of the road as motorists. The other kind of facility is a recreation path.

These typically consist of paved or stone dust trails separated from motor vehicle traffic within neighborhoods, parks, and greenways.

Recreation paths are multipurpose facilities shared by pedestrians, inline skaters, and many other users.

Roadways

There are three main obstacles to bicycle access on suburban roads like those in The City of Milford. The most common problem is that the roads tend to be narrow, so that there is insufficient room for motorists and bicyclists to pass each other at the same time without one or the other crossing over into an oncoming lane or leaving the pavement. This problem can be alleviated by narrowing motorist travel lanes to the minimum dimension possible and paving part of the gravel shoulders on both sides of the road. A white line should show the boundary between the motorist travel lane and the shoulder on roads where the traffic speed exceeds 30 mph.

The second biggest problem is that most intersections tend to be designed only for trucks, buses, and cars. A typical intersection today has large areas of unmarked pavement, the traffic moves in all directions, and the lights change quickly. Bicyclists and pedestrians feel at the mercy of the motorists, and the motorists are not sure where bicyclists or pedestrians are expected to cross. Traffic circulation in these intersections can be made more predictable by adding traffic islands to separate traffic flow, painting bicycle lanes and

crosswalks to show people where the bicyclists and pedestrians will cross, and increasing the amount of time bicyclists and pedestrians have to cross the intersection by adjusting the light signals.

The third biggest problem is that many bridges are too narrow. Most bridges built in the past did not include paved shoulders or sidewalks. The solution is to make these bridges wider, but this is a costly and sometimes difficult undertaking that is usually only done when bridges are replaced with new structures.

Specific Guidelines for Improving Roadways for Bicyclists

Although road improvements to accommodate bicyclists requires a study of actual road and traffic conditions, the following generalizations may be helpful in envisioning the types of facilities most needed in the City of Milford. The dimensions given should be considered the minimum that are usually needed.

On most local streets where the average traffic speed is 30 mph or less, and the traffic type consists mainly of passenger vehicles, then a single shared travel lane 12 to 14 feet wide is often appropriate. Such a road may be suitable for bicyclists of any skill level.

- On most collector and arterial roads where the average traffic speed is 40 mph or less, and the traffic type consists mainly of passenger vehicles, then 4 foot paved shoulders are appropriate. Such a road may be suitable for the Le Tour Group and the Spare Tire bicyclists.

- On most state highways or where the average traffic speed is greater than 40 mph, or where trucks are an important component of the traffic type, then 6 foot paved shoulders are appropriate. Such a road may be suitable for the Le Tour bicyclists only.

- Within commercial districts or other densely developed areas where there are multiple travel lanes, or a combination of travel and center turning lanes, and at intersections where there are dedicated left and right hand turning lanes, then 5-foot bike lanes are usually needed. Both the Le Tour Group and the Spare Tire bicyclists benefit from bike lanes under these conditions.

- On all road segments where there are curbs, railings, and bridge foundations abutting the paved portion of the roadway, extra space is needed next to the shoulder or bike lane. This is called the shy distance, and its purpose is to allow space for pedals, arms, legs, gear and other things that stick out to the side of the bicyclist that might catch on nearby obstructions. The typical shy distance for bicyclists is one to two feet. For example, if a Spare Tire bicyclist typically has a paved shoulder 4 feet wide without a curb, then it should be a minimum of 5 feet wide with a curb.

- Bicycle access can be improved on all roadways and for bicyclists of all skill levels by keeping road edges in good condition. This includes keeping the pavement free of cracks, sand, broken glass, and other debris, as well as ensuring a smooth transition between pavement surface and drainage grates, manhole covers, and other

structures embedded in the pavement surface. The design of drainage grates must not catch or trip bicycle tires.

- Bicycle access and neighborhood quality can be improved throughout the City of Milford by reducing traffic speed. Motorist travel lanes should be striped to the minimum dimensions consistent with good engineering judgment, curves should be retained, and roadside features like stone walls, street trees, lawns, and other landscape amenities should be preserved. These design characteristics serve three purposes. One is to create the impression that the width of the road is narrower than it really is. The second is to make drivers aware that there are obstacles and activities near the roadway that warrant the driver's caution. The third is to enhance the beauty and quiet of the City's streets. Each of these actions helps to ensure slower traffic.

IV. PEDESTRIANS

Existing Pedestrian Facilities

What is a pedestrian?

A pedestrian is any person walking or in a wheelchair on a sidewalk or along a roadway. Everyone is a pedestrian at some point during a trip, whether it is from home to a parking lot, to a work site, or for an entire trip.

It is not easy to be a pedestrian. Because of obstacles posed by facilities designed primarily for the automobile; highways and other busy streets often act as barriers to walking. Such "barriers" can limit or prohibit pedestrian travel both along and across a highway. These "barriers" can severely limit the lives of those dependent on walking because they are cut off from large sections of their community.

All pedestrians are extremely vulnerable to vehicular traffic. Some pedestrians are at an especially dangerous disadvantage due to personal physical or mental limitations. The plan identifies those who most commonly face these limitations as "pedestrians with special needs": the elderly, children, and people with disabilities.

Riverwalk

The City of Milford's Riverwalk is the heart and soul of Milford. Begun in ?? under the leadership of Gary Emory, Superintendent of Recreation, the Riverwalk is a ?? mile walk, winding along the Mispillion River. The Riverwalk is

scenic, environmental, and a walkable asset that provides the residents with a major pedestrian walkway.

Pedestrian Facilities

The majority of existing pedestrian facilities for the City of Milford include sidewalks which are found in the older part of town. This includes the area roughly from Tenth Street on the north, Rehoboth Boulevard on the east, Seabury and McCoy Streets on the south and DuPont Boulevard on the west. There may be some sidewalks or walking trails outside of this area but they would be very limited. It is the policy of the Planning Commission to adhere to the existing Subdivision Ordinance to recommend sidewalks in all new residential development which would encourage connectivity with other neighborhoods and commercial developments.

Having stated what a pedestrian is and what a pedestrian does, there needs to be goals, a vision, and a strategy to achieve results on a long term basis.

Following are a list of Goals to improve the walking conditions for the City of Milford.

Goal 1: Encourage the number and improve the quality of walking trips in the City of Milford. Increasingly recognized as an important method of travel, walking and pedestrian issues received increased attention in the late 2000's with the passage of various Federal laws namely the Complete Streets Act, which requires

pedestrian facilities when any street is rehabilitate or the construction of any new street.

Goal 2: Increase the availability of pedestrian planning and design guidelines and other general information for local officials and developers by providing a copy of this plan to potential residential and commercial builders.

Goal 3: Increase the connectivity between commercial and residential developments.

Instead of people getting in their cars and traveling short distances, the City of Milford wants to encourage connectivity between these different land uses, reducing the use of gasoline and improving the environment.

The vision for the City of Milford regarding pedestrians is to improve access for all age groups, particularly in the Downtown Area through connectivity with the Riverwalk, improved accessibility in all new residential development, and connectivity between different land uses.

The strategy for this vision is as follows:

- In all new residential development the Planning Commission will recommend these types of development install sidewalks.
- When any new street is improved either by the City or DelDot they will comply with the Complete Streets Act.

- The Planning Commission should recommend connectivity between any commercial and planned residential development.

Needs

People walk for transportation, exercise and recreation, to visit neighbors, and to access buildings in commercial districts and cultural areas after parking a car. Each of these needs may be served by the use of one or more facilities.

People walking for exercise and recreation are likely to use quiet streets near their own homes, or they may drive to a pleasant environment suited for walking, such as the Riverwalk in Downtown, or a recreation trail. People visiting their neighbors use local streets and sidewalks to the greatest extent possible. People walking for transportation from home to work or play from parking lots from one store to another in a commercial district use sidewalks, pedestrian plazas, and malls.

The distance that people are willing to walk to reach a destination varies greatly. For shopping within commercial districts, it is best if most destinations lie within a circular area of one quarter mile or less, or about the distance that can be covered easily in about 5 to 10 minutes. To reach a favorite recreation site, a bus terminal, or for exercise, the distance is likely to be twice as much, or about one half mile. Population centers and activity centers that lie within these limits should be linked together with sidewalks and recreation trails in a

way that provides pedestrians many choices of routes and destinations.

Typical Facilities

The main need of pedestrians is to be separated from automobile traffic and to have a firm, dry surface to walk on. This need is usually satisfied by an off-road facility, such as a sidewalk, recreation path, or trail. Walking paths can be made of many materials, but smooth and firm surfaces are important for most pedestrians, including young children, the elderly, and anyone pushing a wheeled vehicle such as a baby carriage. Within the City of Milford pedestrians often either use the gravel shoulders next to the motor vehicle travel lanes or the travel lane itself, which is not the ideal situation.

The most common pedestrian facilities needed in new residential developments and in commercial areas are sidewalks. On local streets within subdivisions, where use is low, sidewalks may be only 4 feet wide, as required in the Subdivision Ordinance. Sidewalks along collector and arterial roads should be wider, perhaps 5 to 6 feet wide, as established by DelDot and the Complete Streets requirements in order to allow space for handicap access or for two people to walk side by side. In high use areas, such as where there are clusters of stores, restaurants, and theaters, or, in front of large facilities where many people enter and leave the building at one time, sidewalks should be replaced with plazas and pedestrian malls.





Pedestrian Goals and Objectives

Plan Philosophy

Sidewalks and recreation paths are important outdoor recreation resources. They are also important alternatives to motor vehicle transportation, often giving young people and elderly people the only means they have for traveling on their own.

Pedestrian facilities are also important because they are an excellent measure of a City's quality of life. People often define the limits of their neighborhoods by how far they can walk comfortably, without encountering inhospitable roadways, parking areas, and other obstructions. Neighborhoods and commercial areas that are pleasant for bicycling are also pleasant places to live and work. In a community that is designed to accommodate pedestrians, the negative effects of motor vehicle traffic are mitigated by well-planned sidewalks in residential neighborhoods and commercial areas.

The principles guiding the planning of pedestrian facilities are as follows:

1. Provide a safe, efficient walking network that improves access, connectivity and mobility throughout the City and by removing obstacles to pedestrians and continue to require sidewalks for all residential subdivisions.



2. Create a policy framework and action program to enhance walking as a viable transportation choice, particularly for commutes and errands under two miles.
3. Implement a citywide network of walkways connecting activity centers, schools, employment districts, the Downtown Area and neighborhoods.
4. Provide linkages between places where people live and where they want to go, along routes that are short, attractive, safe, and efficient as possible, consistent with avoiding major conflicts with automobile traffic. All sidewalks and recreation paths should be considered as part of an integrated alternative transportation network that is comprehensive and continuous throughout the City of Milford.
5. Improve sidewalks in the Downtown Area and the surrounding commercial area when warranted and depending on available funding for such activity.



Bicycles

Goal

Improve access for bicyclists City-wide by incorporating bicycle access and facilities into the planning, design and construction process when major residential communities and commercial establishments are constructed as well as when road reconstruction happens and open space is provided in residential developments.

Objectives for Le Tour Bicyclists

- Reduce the potential conflict between motorists and bicyclists on DelDOT roads by providing space for bicycles on roads where motorist's speeds are not compatible with bicyclist's speeds, complying with the Complete Streets Act for the State of Delaware and by lowering traffic speed where possible.
- Determine the amount of additional pavement needed for bicycle access by taking into account traffic speed, traffic volume, and current pavement width, among other factors, using a standardized evaluation methodology.
- Reduce the barriers to bicycle travel posed by narrow bridges by incorporating additional pavement width in the form of paved shoulders or wide outside travel lanes on new bridge structures.

- Make traffic flow on busy streets slower and more predictable, particularly those in commercial zones where there is a high percentage of truck traffic.
- Keep pavement surfaces clean and free of cracks, potholes, and debris.

Objectives for Spare Tire Bicyclists

- Link population centers within a two mile radius of activity centers with at least one road improved for bicycle access or a recreation path.
- Improve City roads and rehabilitation of City roads for bicycle access by adding paved shoulders at least 4 feet wide (5 feet wide if a curb is present) on both sides of the street.
- Provide access between points of interest within commercial zones by providing bike lanes, recreation paths, or both.
- Make traffic flow at all intersections along the route slower and more predictable.
- Provide bicycle parking at activity centers (Public facilities, commercial facilities, and recreational facilities) for all user types.
- Design routes that have easy grades.

Objectives for Kickstand Bicyclists

- Provide linkages between neighborhoods, and between neighborhoods and schools, parks, and recreational facilities, using local streets or recreation paths.
- Provide linkages between points of interest within parks and recreation areas, such as ball fields' and playgrounds through the use of recreation paths and park roads.

Pedestrians

Goal

Improve year round access for pedestrians within commercial areas and population centers by incorporating pedestrian access into the design and maintenance of streets, parks, recreation facilities, store fronts, parking areas, and other destinations, with a special emphasis on facilities that are continuous, easy to use, and visually attractive.

Objectives for Commercial Centers

- Make pedestrian safety and mobility the first priority in downtown commercial areas, bicyclists second, transit third, then motorized vehicles.
 - Provide safe access beside and across collector and arterial roads, with special attention to the design of crosswalks at busy intersections.
 - Connect store fronts to the sidewalks along streets without causing pedestrians to walk down parking aisles.
 - Link stores, theaters, and restaurants with recreational and institutional facilities through an integrated system of sidewalks and pathways that provide continuity and multiple routes of travel.
- Link commercial centers to population centers and schools with sidewalks or recreation paths if they lie within a one mile radius of the commercial district boundary.
 - Reduce parking requirements in commercial pedestrian friendly streets/areas.
 - Consider innovative facilities to provide for bicycle circulation in confined right of ways.

Objectives for Population Centers

- Provide safe access beside and across collector and arterial roads through the use of sidewalks.
- Link homes with destinations like schools, parks, and other neighborhoods through an integrated system of sidewalks or paths that provide shortcuts, loops, and multiple routes of travel that avoid conflict with motor vehicle traffic to the greatest extent practicable.
- Link population centers with other population centers that lie within a one mile radius.

Recommendations#

The City of Milford's Policy on Standards

When the needs of all user groups are studied, the result is a set of recommendations for improvements that are envisioned in the Ped/Bicycle Master Plan for the City of Milford. A minimum level of bicycle access is now recommended on all City and State roads, and pedestrian access is now recommended to a much greater extent within developed residential areas.

Along with the knowledge of greater need is the awareness that the City and State have limited resources. There are limitations to financial resources, the time available on the part of the City officials and staff to implement plans, and limitations to the amount of public support that exists for building facilities of any kind, given other needs of the community. There are also physical limitations to achieving the kind of facilities many would like. For bicycle and pedestrian facilities, there is often limited space within the right-of-way of many of the State of Delaware roads. Paved shoulders and sidewalks must, therefore, often compete with utility lines, street trees, and scenic roadside features that most people want to preserve.

Improvements Should be Gradual

Given the disparity between the needs of all user groups and the resources available to provide better access, the City of Milford has determined that an incremental

approach to improvement of facilities is both necessary and justified. The City of Milford acknowledges that it cannot always build improvements that meet all current standards and guidelines for size, width, or surface material that are usually described in the planning and engineering literature for bicycle and pedestrian facilities. For example, most guidelines for bicycle access would require the City of Milford to build paved shoulders 4 to 5 feet wide on most of its collector and arterial roads, even for Le Tour bicyclists. This is clearly unrealistic for cost and space reasons. Even if the City of Milford had unlimited funds for these improvements, upgrading all of the City's roads to this standard would be a lengthy and difficult process of reconstruction.

Priorities for New Facilities

Pedestrian facilities should be provided to those who need them the most such as the elderly and children. Facilities should also provide access between the places where people live and where they want to go in the most logical way possible, making a complete and interconnected system. Thus, in choosing which pedestrian facilities to build, all other factors being equal, four factors should be taken into account:

- Population density/commercial density;
- Use by children and the elderly;
- Importance of the destinations along the route; and,
- Traffic conditions along the expected routes of travel.

When these factors are analyzed City-wide, the general pattern for building sidewalks according to priority turns out to be the following:

1. The most important pedestrian facilities from a City-wide perspective are those within activity/CBD commercial centers and those which serve large numbers of children and the elderly.
2. The next most important pedestrian facilities are those that connect/CBD commercial activity centers to surrounding neighborhoods.
3. The last priority is providing connections within individual neighborhoods.

new subdivisions when it is possible to link two parts of a neighborhood across short distances.

General Policy Development

There are a number of policies that should be developed to improve access for children and adults within and between subdivisions. This work is not rated in order of priority because it involves ongoing work of the Planning Commission rather than a capital improvement. Therefore the Planning Commission would:

- Require the development of sidewalks and pedestrian amenities and recreation paths between new and old subdivisions and between residential subdivision and public uses as well as commercial uses.
- Require bicycle and pedestrian access across cul-de-sacs, hammerheads and other dead ends in

V. Bicycle Facility Design Guidelines

On-Road Bicycle Facilities

There is extensive literature relating to guidelines for on-road bicycle facilities. AASHTO and FHWA, as well as many states, offer a wide range of guidelines for various types of bicycle accommodations. There are essentially three types of on-road bicycle facilities: paved shoulders, shared roadways (including wide curb lanes), and bicycle lanes. All on-road bicycle facilities should be designed so bicyclists travel in the same direction as motorists. Safety is of great concern in the design of on-road bicycle facilities. Conflicts with pedestrians, automobiles, or other bicyclists can lead to serious injury. Poorly maintained pavement, snow build-up and debris can also lead to safety problems. The guidelines listed below are minimum recommendations only, and site-specific conditions may dictate variations for safety purposes.

Clear Trail Width

- Paved shoulders: minimum 4 feet, to accommodate bicycle use, but refer to AASHTO's "A Policy on Geometric Design of Highways and Streets (Green Book)" and FHWA's "Selecting Roadway Design Treatments to Accommodate Bicycles" for recommendations for greater shoulder width, which is desirable where shoulders provide multiple benefits and where motor vehicle speeds exceed 50 miles per hour (see Figure 4-11).

- Paved shoulders adjacent to guardrails or other roadside barriers: 5 feet.
- Widened curb lanes: 14 feet of usable lane width (see Figure 4-12).
- Widened curb lanes on steep uphill segments: 15 feet (continuous wide lanes greater than 15 feet are not recommended, as motor vehicles may use them as two lanes).

FIGURE 4-11: PAVED SHOULDER DIMENSIONS

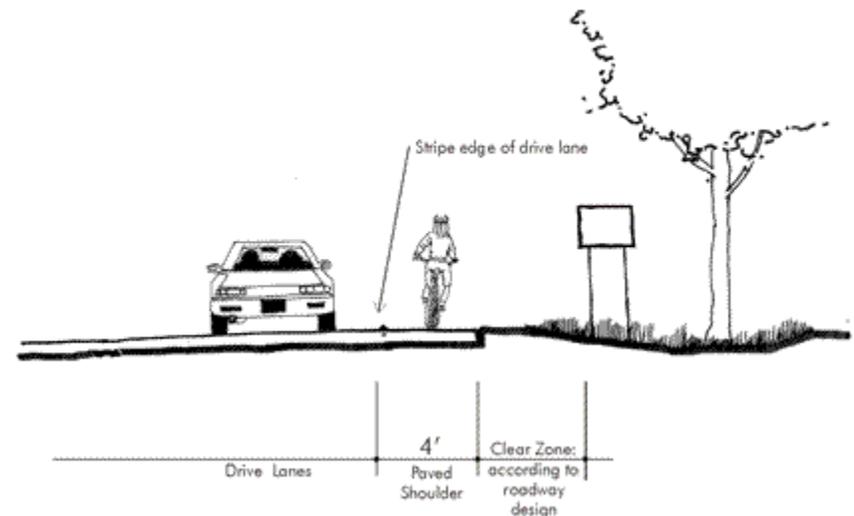
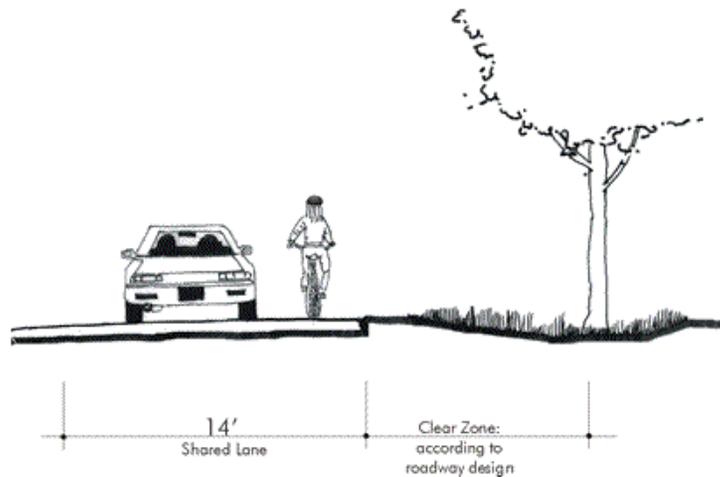


FIGURE 4-12: SHARED LANE DIMENSIONS



- Minimum width of bicycle lanes: 4 feet as measured from edge of roadway, or 5 feet as measured from the face of the curb or a guardrail to the bicycle lane stripe (see Figure 4-13).
- Desirable width of bicycle lanes: 5 feet as measured from edge of roadway.
- Minimum width of bicycle lanes adjacent to parking: 5 feet (see Figure 4-14).

FIGURE 4-13: BICYCLE LANE DIMENSIONS

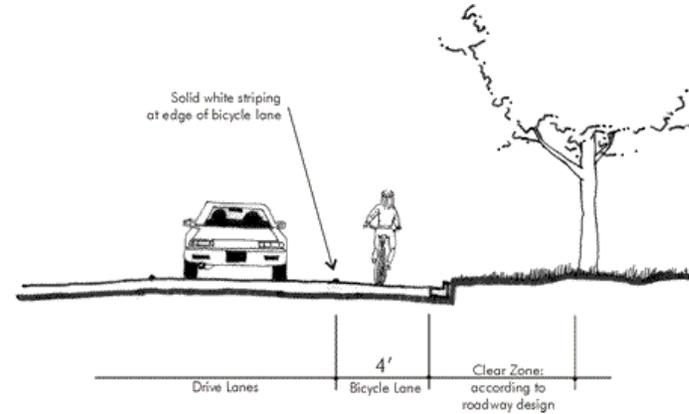
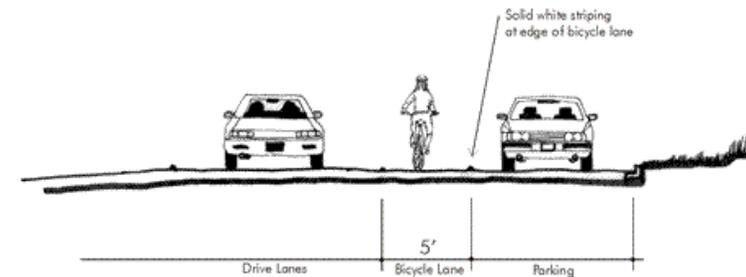


FIGURE 4-14: BICYCLE LANE DIMENSIONS ADJACENT TO PARKING



One issue that may impact on-road bicycle facilities is the presence of rumble strips. Occasionally used on roadways with rural sections, they will lessen the usable width of an on-road bicycle facility. Rumble strips "...are not recommended where shoulders are used by bicyclists

unless there is a minimum clear path of 1 foot from the rumble strip to the traveled way, 4 feet from the rumble strip to the outside edge of paved shoulder, or 5 feet to adjacent guardrail, curb or other obstacle." (AASHTO Guide, 1999).

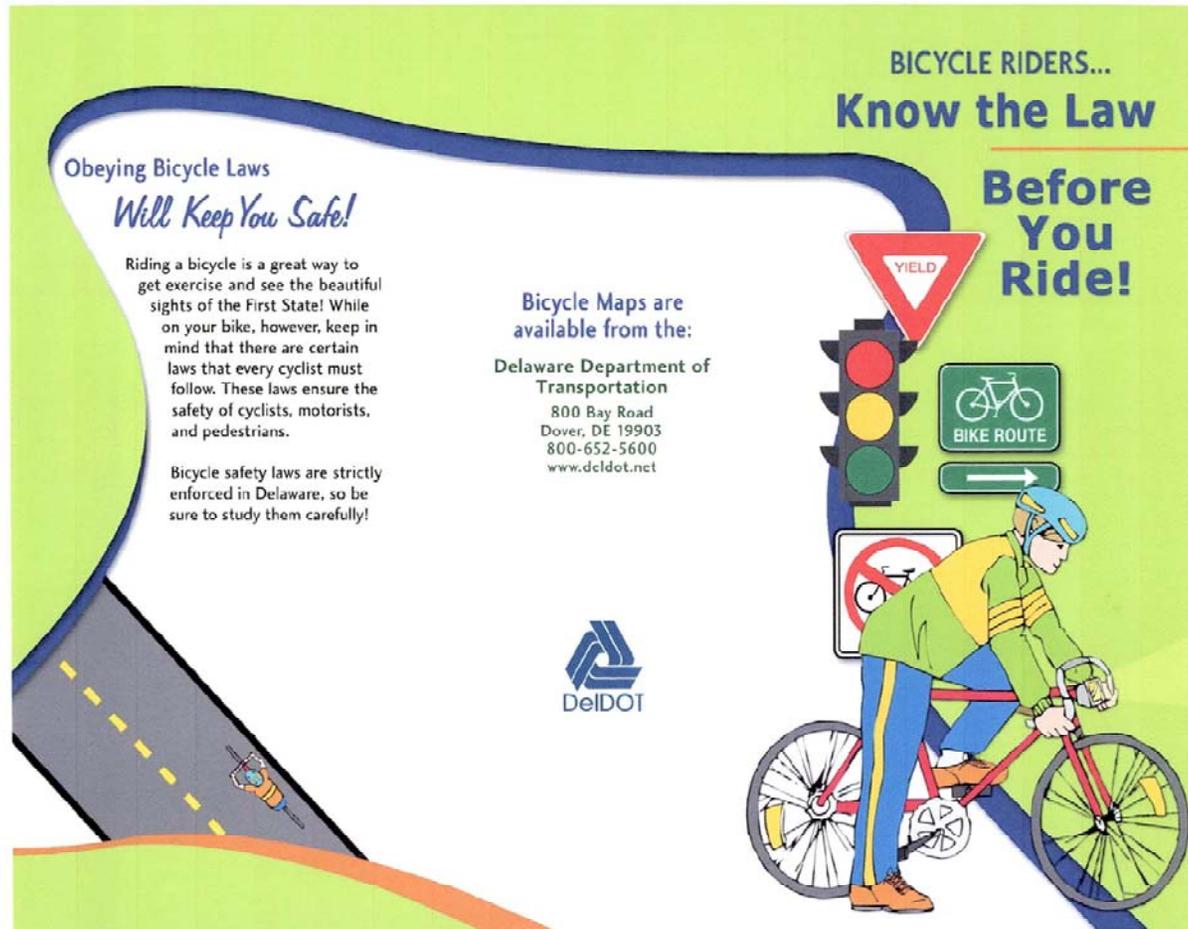
Clear Zones, Vertical Clearance, Trail Surface, Alignment, Profile, and Edge Protection

On-road bicycle facilities will normally benefit from design standards required by the roadway itself. Such requirements are sufficient for the bicycle facility. On-road bicycle facilities should only be designated on hard-surfaced roadways.

Drainage

The primary drainage issue to consider regarding on-road bicycle facilities is the existence of roadway drain inlets. Some types of inlet grates may trap a bicycle wheel or send the rider off course. Bicycle-compatible inlets are widely available, and these should be used on all roadways where bicyclists are expected. On rural sections, the cross-slope required by roadway construction is adequate to drain the bicycle facility.

VI. Education



**BICYCLE RIDERS...
Know the Law**

**Before
You
Ride!**

**Obeying Bicycle Laws
Will Keep You Safe!**

Riding a bicycle is a great way to get exercise and see the beautiful sights of the First State! While on your bike, however, keep in mind that there are certain laws that every cyclist must follow. These laws ensure the safety of cyclists, motorists, and pedestrians.

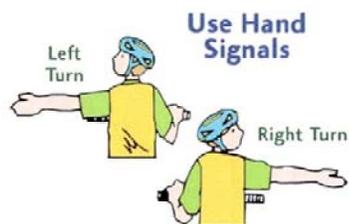
Bicycle safety laws are strictly enforced in Delaware, so be sure to study them carefully!

Bicycle Maps are available from the:
Delaware Department of Transportation
800 Bay Road
Dover, DE 19903
800-652-5600
www.deldot.net

DeIDOT

The poster features a green background with a blue wavy line. On the left, a road with a dashed yellow line curves down a hill where a small cyclist is riding. On the right, a cyclist in a green and yellow jacket and blue helmet is riding a red bicycle. Above the cyclist are traffic signs: a red triangular 'YIELD' sign, a traffic light with red, yellow, and green lights, a green square 'BIKE ROUTE' sign with a white bicycle icon, and a white square sign with a red circle and slash over a bicycle icon. The DeIDOT logo is at the bottom center.

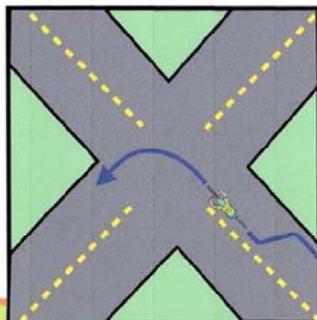
Delaware is Serious About Enforcing Bike Safety Laws



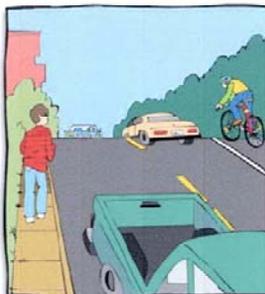
Use Hand Signals

Right Way to Turn Left

Ride on right, carefully move to the left of lane for left hand turn.



Always Ride in the Same Direction as Traffic



Use Proper Safety Equipment



- Helmet
(Required by law if under the age of 16, but recommended for all ages.)
- Reflective Clothing
- Headlight and Reflectors on Your Bike

Obey All Traffic Signs & Signals



Stop
Clear the Intersection
Go



Don't Drink & Ride!

Drinking and driving laws are the same for cars and bikes.

Headphones Must Not Cover Both Ears!





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P.O. Box 778
Dover, DE 19903
(302) 760-BIKE
- Amy Wilburn, Chair

Bicycling in Delaware » Delaware Bike Laws

Delaware Legislation will Protect Cyclists and Pedestrians
(posted to site August 4, 2003)

Abby Reichardt of Dover, DE, felt "betrayed" by the justice system when the driver of a truck that struck and killed her father had his charge reduced from criminally negligent homicide to careless driving, a misdemeanor offense with a potential maximum sentence of a \$115 fine and 30 days in prison. Her father, Warren G.H. Pritchett Jr., was struck from behind by a truck while bicycling along a rural road last November 20.

When she learned of the reduced charge, Reichert contacted every officeholder who could possibly help change the law. She was greatly assisted by Don Carbaugh, chairman of the Delaware Bicycle Council, an appointed body that advises the governor on bicycle-related issues. Recently, the Delaware State Senate passed HB190, the Warren G.H. Pritchett Jr. Act, which was signed by Governor Ruth Ann Minner, closing a gap in the Delaware legal code that had allowed some drivers to face little more than a reckless driving charge when involved in a crash, even if their actions caused the death of another person. The Act adds an unclassified misdemeanor to the state's traffic code, and provided a first-offense penalty of a maximum \$1,150 fine and 30 months imprisonment. For more detailed information see the original story in the Dover Post.

(Reprinted by permission from the League of American Bicyclist e-newsletter)

In 1995 the state legislature passed a helmet law which took effect April 1, 1996. This law requires all children under age 16 to wear a helmet while bicycling or in a trailer or child bicycle seat and establishes a bicycle helmet bank to provide free helmets to low income children who cannot afford to buy helmets. Other states have bicycling laws online.

Child Bicycle Helmet Law (HB 57)

Effective April 1, 1996 a person under sixteen years of age shall not operate, ride upon, or ride as a passenger any bicycle, unless that person is wearing a properly fitted and fastened bicycle helmets which meets or exceeds the ANSI Z90.4 bicycle helmet standard (or subsequent standard) or the Snell Memorial Foundation's 1984 Standard (or subsequent standard) for Protective Headgear for Use in Bicycling. This requirement shall apply to a person who rides upon a bicycle while in a restraining seat which is attached to the bicycle or in a trailer towed by the bicycle. This requirement applies at all times while a bicycle is being operated on any property open to the public or used by the public for pedestrian and vehicular purposes.

Any guardian who fails to cause his child to wear a bicycle helmet shall be fined for the first offense \$25, and for each subsequent offense \$50. The court may dismiss all charges if presented evidence that a violator has purchased or obtained a bicycle helmet meeting the standards mentioned above.

Bicycle Helmet Bank and Bicycle Safety Education Programs

The helmet law also led to the formation of a bicycle helmet bank to provide free helmets to children who cannot afford to buy helmets. Helmets are available through the public schools. For more information call 760-BIKE.

Also, the law called for expansion of the University of Delaware Cooperative Extension Service's BIPED safety education program. Now every elementary and middle school in the state is offered a program on bicycle safety presented by volunteers from area bicycle clubs and other

http://www.deldot.gov/information/community_programs_and_services/bike/biking_in_d... 11/15/2010

volunteers. For further information, contact Mark Manno in New Castle County at 831-8965. In Kent county please contact John Urban at (302) 697-4000 and in Sussex county please contact Ron Jester at (302) 856-7303 or Diaz Bonville.

Other Delaware Bicycling Laws:

1. Parents and guardians shall not authorize or permit violation of these laws by the child or ward.
2. Every person riding a bicycle shall have all the rights and responsibilities of a driver of any other vehicle.
3. No bicycle shall carry more persons than it was designed to carry, except an adult rider may carry a child securely attached in a back pack or sling.
4. A trailer or semitrailer may be securely attached to a bicycle.
5. Persons riding a bicycle, coaster, roller skates, sled or toy vehicle shall not cling to another vehicle upon the highway.
6. When traveling less than the normal speed of traffic a bicycle shall be ridden "as close as practicable" to the right-hand edge of the roadway except: a) When passing another bicycle or vehicle, b) When making a left-hand turn, c) When avoiding parked or slow moving vehicles, fixed or slow moving objects, animals, surface hazards, etc., or d) When the lane that is narrow for a bicycle and a vehicle to travel safely side by side within the lane.
7. Riding no more than two abreast is permitted only within a single lane and when not impeding the normal and reasonable movement of roadway traffic.
8. A person riding a bicycle shall have both hands available to operate the bicycle. At least one hand shall be kept on the handlebars at all times. A one-armed person may ride a bicycle and must use mechanical turn signals.
9. Left turns shall be permitted according to:
 - a. Normal motor vehicle type of left turn procedure
 - b. Approach the turn on the right edge of the roadway, across the intersecting roadway, stop out of the way of traffic, yield to all vehicles and pedestrians, obey all traffic control devices and then proceed in new direction.
 - c. Special traffic control devices
10. The right arm may be used to signal right turns
11. Right and left turn signals shall be given not less than 100 feet from turn and while stopped waiting to turn. Such signals may be given intermittently, rather than continuously, if the hand giving the signals is needed to control the bicycle.
12. A person riding a bicycle on a sidewalk or in a crosswalk shall yield to pedestrians and give an audible signal before overtaking.
13. A person shall not ride a bicycle on a sidewalk or crosswalk when prohibited by official control devices.
14. A person riding a bicycle on a sidewalk, or pushing a bicycle across the road at a crosswalk shall have all the rights and responsibilities of a pedestrian.
15. A bicycle may be parked on a sidewalk except when prohibited by official control devices or when impeding the normal and reasonable movement of sidewalk traffic.
16. Bicycles may be parked where vehicle parking is allowed.
17. Bicycles may not be parked in such a way as to obstruct the movement of a legally parked motor vehicle.
18. A uniformed police officer may stop, inspect and test a bicycle that is suspected to be unsafe or to have improper equipment
19. When riding at night, a bicycle shall be equipped with a front, white light visible for at least 500 feet from a motor vehicle with lawful low beam head lamps.
20. Every bicycle shall be fitted with a rear, red reflector visible for at least 600 feet from a motor vehicle with lawful low beam head lamps.
21. When riding at night, a bicycle shall be equipped with reflective material visible from both sides for at least 600 feet, or a lighted lamp visible from both sides for at least 500 feet, from a motor vehicle with lawful low beam head lamps.
22. A bicycle and its rider may be equipped with additional lights and reflectors.
23. Every bicycle shall be equipped with brakes that are capable of stopping the bicycle within 25 feet from a speed of 10 mph on dry, clean level pavement.
24. Every bicycle sold at retail shall have a permanent identification number stamped or cast on its frame.
25. A person riding a bicycle shall not wear ear plugs in both ears or a headset covering both

http://www.deldot.gov/information/community_programs_and_services/bike/biking_in_d... 11/15/2010

26. A person who is hard of hearing may wear a hearing aid while riding a bicycle

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Delaware Bicycle Council

Promoting and Enhancing Bicycling in Delaware



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P.O. Box 778
Dover, DE 19903
(302) 760-BIKE

Amy Wilburn, Chair

Safety & Education » Bike Manual for Kids

Delaware Bicycle Driver's Manual for Kids

Driving a bicycle is fun, is good exercise and doesn't pollute the air. But, driving a bicycle can be very dangerous. Each year, about 150 Delaware bicycle drivers are injured in bicycle accidents and 2-3 bicycle drivers are killed. Driving a bicycle safely requires skill, adherence to Delaware Bicycles Laws and safe, defensive driving practices.

Be Responsible

Remember, bicycles are vehicles, just like cars, trucks and buses, and you are a driver. All vehicle drivers, including bicycle drivers, follow the same rules of the road. A safe bicycle driver always drives on the right side of the road, obeys all traffic signs and signals, and uses hand signals to let other drivers know when he's going to stop or turn.

Be Visible

Bicycles are smaller and harder to see than other vehicles. Help other drivers see you by wearing bright and fluorescent colors and by using a bicycle safety flag. A bicycle safety flag is the single best thing to increase your visibility. A bicycle flag costs only a few dollars and attaches to every type of bicycle.

Avoid driving your bicycle at night! It's very hard to see you at night. The bicycle/ car accident rate is twenty time higher at night. If you must drive at night your bicycle must have a front white light visible for at least 500 feet and a rear reflector that can be seen for at least 600 feet. You must also have white or yellow reflectors on the wheels and pedals. Make sure all your reflectors are in place and are tight and clean. In addition, the bicycle driver should wear white clothing, plus a reflective vest or other reflective clothing.

Be Predictable

Being a visible bicycle driver will help a car driver see you, but you must also be predictable so they know what you're going to do. You can be predictable by driving on the right side of the road, obeying all traffic signs and signals and by using hand signals to indicate stops and turns.

Drive with the traffic on the right hand side of the road, not against it. Bicycle drivers should not drive on roads with a posted speed limit greater than 50 mph, but may drive on the shoulder. Bicycle drivers should drive on the paved shoulders or in the bike lanes. If there is no paved shoulder or bike lane, bicycle drivers must drive as far on the right-most portion of the right side as is practical. Do not weave in and out of parked cars and watch out for street drains, loose gravel, pot holes, opening car doors, dogs and other hazards.

It's important to use hand signals to let other drivers know when you're going to slow down, stop or make a turn. Give hand signals at least 100 feet before stopping or turning to allow car and truck drivers enough time to avoid hitting you. Practice your hand signals in a safe area until you can do them with ease.

Traffic only works if all people interpret the laws and messages the same. Sign, signals, and pavement markings tell us what to do. If you fail to follow some, you may get hurt. If you fail to follow others, you will get hurt. To make it easier to follow signs, traffic engineers repeat the message three times, by color, by shape, and by words or the symbol used.

Every driver is required to obey all traffic signs and signals. At a traffic light a bicycle driver

http://www.deldot.gov/information/community_programs_and_services/bike/safety/manu... 11/15/2010

should signal and stop when the light is red. When the light turns green scan before you start. Scanning means looking left, right and left again to make sure no cars are coming. The yellow light means caution and warns the light will soon change to red. For bicycle drivers, yellow should mean the same as red - STOP!

Be Defensive

Being alert means paying attention to what you're doing. Driving a bicycle is serious business. Watch out for cars and trucks, loose gravel, street drains, opening car doors, dogs and other hazards.

At intersections and before entering a street ALWAYS SCAN. Look left, right and left again. Make sure you see cars and trucks because they may not see you. Know what's around you at all times.

All vehicle drivers, including bicycle drivers, should drive defensively. Watch out for the other guy! Bicycles are difficult to see so stay out of the way of cars and trucks. Car and truck drivers will sometimes go through a red light or not stop at a stop sign. You may have right of way, but being right won't help much if you get hit by a two-ton car going fifty miles an hour. Drive defensively for your safety.

Be Equipped: Wear a Helmet - It's Our Law!

If all bicycle drivers wore helmets there would be fewer bicycle drivers killed in accidents. Three out of four bicycle fatalities are due to head injuries. A good bicycle helmet can prevent or reduce the seriousness of these injuries.

New bicycle helmets are light, provide good air circulation, fit a wide range of head sizes and cost as little as \$20. When buying a helmet look for one that meets performance standards by the American National Standards Institute and /or the Snell Memorial Foundation.

If you break your arm, the doctor will put it in a cast and in six to ten weeks you'll be as good as new. If you break your head you may be permanently injured or killed. A good helmet can save your life.

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Delaware Bicycle Council

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Dover, DE 19903

(302) 760-BIKE

Amy Wilburn, Chair

Safety & Education » Safety Checklist

Bicycle Safety Checklist

Size - Fit of bicycle to bicycle driver

1. Can bicycle driver straddle frame with both feet on the ground?
2. Check height of seat post (provide minimum clearance in frame as recommended by manufacturer).

Handlebars

1. Tight and in line with wheelHeight below driver's shoulder level?
2. Check height of stem (provide minimum clearance in frame as recommended by manufacturer).
3. Grips tight and ends in good condition?

Frame

1. All tubes in line, not bent?
2. Front fork straight, in good condition?

Pedals

1. Tight, intact, no binding?

Wheels

1. Both run true side to side and round?
2. Spokes - good tension, none missing?
3. Rims - no dents, free of rust: if caliper brakes, the side clean and free of lubricants?
4. Tires - properly inflated, good tread, no sidewall damage, straight valve stem?

Bearing - No looseness or binding?

1. Front wheel
2. Front fork
3. Rear wheel
4. Pedal crank

Chain

1. 1/2" play, no excessive looseness with derailleurs per manufacturer recommendation?
2. Chainguard - unbent, free of chain?
3. Clean and free of rust?

Brakes

1. Coaster brakes - operate with 20 degrees travel before brake is engaged; brake arm strap fully tightened?
2. Hand brakes - sufficient reserve when lever is engaged, and brake lever tight?
3. Caliper brakes centered and tight?
4. Nuts tight on brake shoes?
5. Proper clearance of 1/16" of shoe from rim?

6. At least 3/16" rubber on brake pad?
7. Cable taut, no frayed ends?

Other safety equipment

1. Shift control operating properly?
2. Multi-speed mechanism operating properly; hub and derailleur is functional in all gears?
3. Red rear reflector - conforms to local laws?
4. Reflectors visible from both sides when riding at night?
5. Front light - battery or generator and bulb satisfactory?
6. Bell or horn - working and audible

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VII. Appendix

Delaware Bicycle Facilities Master Plan

How the Plan will be Developed

<p>December 2003 – March 2004</p>	<p>Identify existing and planned bicycle facilities Assess DelDOT plans, programs and practices Review county and municipal plans for bike projects and policies Conduct Interviews: <ul style="list-style-type: none"> DelDOT: Planning, Design, Construction, Traffic, Maintenance Delaware Transit Corporation (DTC) Delaware Dept. of Natural Resources and Environmental Control (DNREC) Delaware Department of Education Delaware Office of Highway Safety, Metropolitan Planning Organization staff Local agencies, Others Field observations Preliminary Recommendations for Bicycle Corridors</p>
<p>Continuous</p>	<p>Public Input/Public Website</p>
<p>February & June</p>	<p>Public Workshops</p>
<p>February – May</p>	<p>Refinement of preliminary Bicycle Corridors <ul style="list-style-type: none"> Specific network priority routes identified Recommendations on facility types made by route Recommendations made on design criteria</p>
<p>June 2004</p>	<p>Presentation of Detailed Corridor recommendations and Design Guidelines at Public Workshops</p>

Delaware Bicycle Facilities Master Plan

Types of Bicycle Facilities



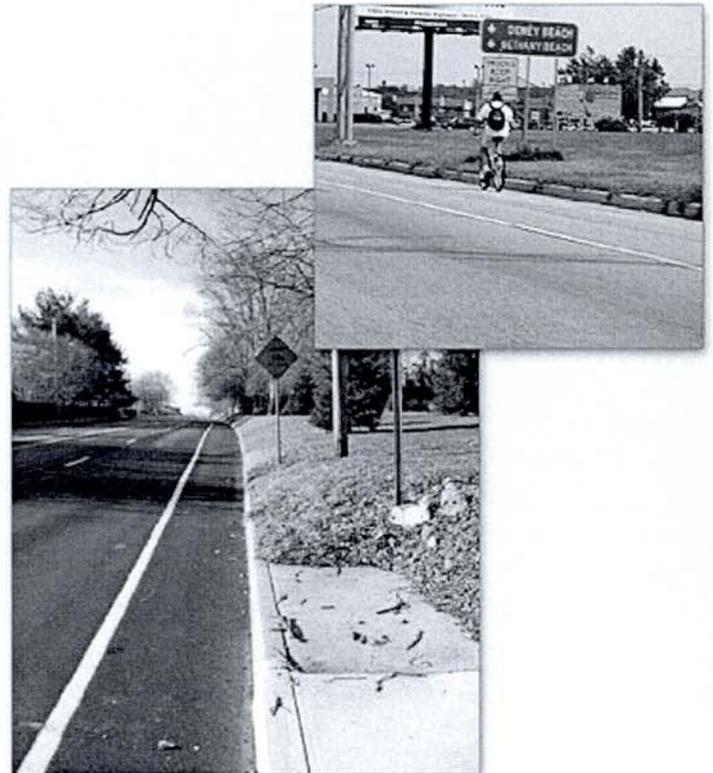
Shared Use Path



Bike Lane



Signage



Paved Shoulder

Delaware Bicycle Facilities Master Plan

What trips are we planning for?



Utility Trips



Recreational Trips



Commuters

School Trips



Delaware Bicycle Facilities Master Plan

Tell us the places you want to go by Bicycle:

- Parks/environmental areas?
- Beaches?
- School or college?
- Shopping?
- Around the community?
- Work?



Can you get to those places by bike and transit?

Did you know that DART buses in Sussex and Kent County have bike racks for you to use ?



DeIDOT

WRA

Delaware Bicycle Facilities Master Plan

Legend

Bicycle Corridors

— Bicycle Route 1 (Existing)

← Potential Bicycle Corridors

— Other Existing Bike Routes

— Proposed Bike Routes

— Completed Pathways & Trails

— Proposed Pathways & Trails

— Funded State Projects

— Local Plans

— Railroads

— Interstate Highways

— Major Highways

— Other Highways

— Major Roadways

— Minor Roadways

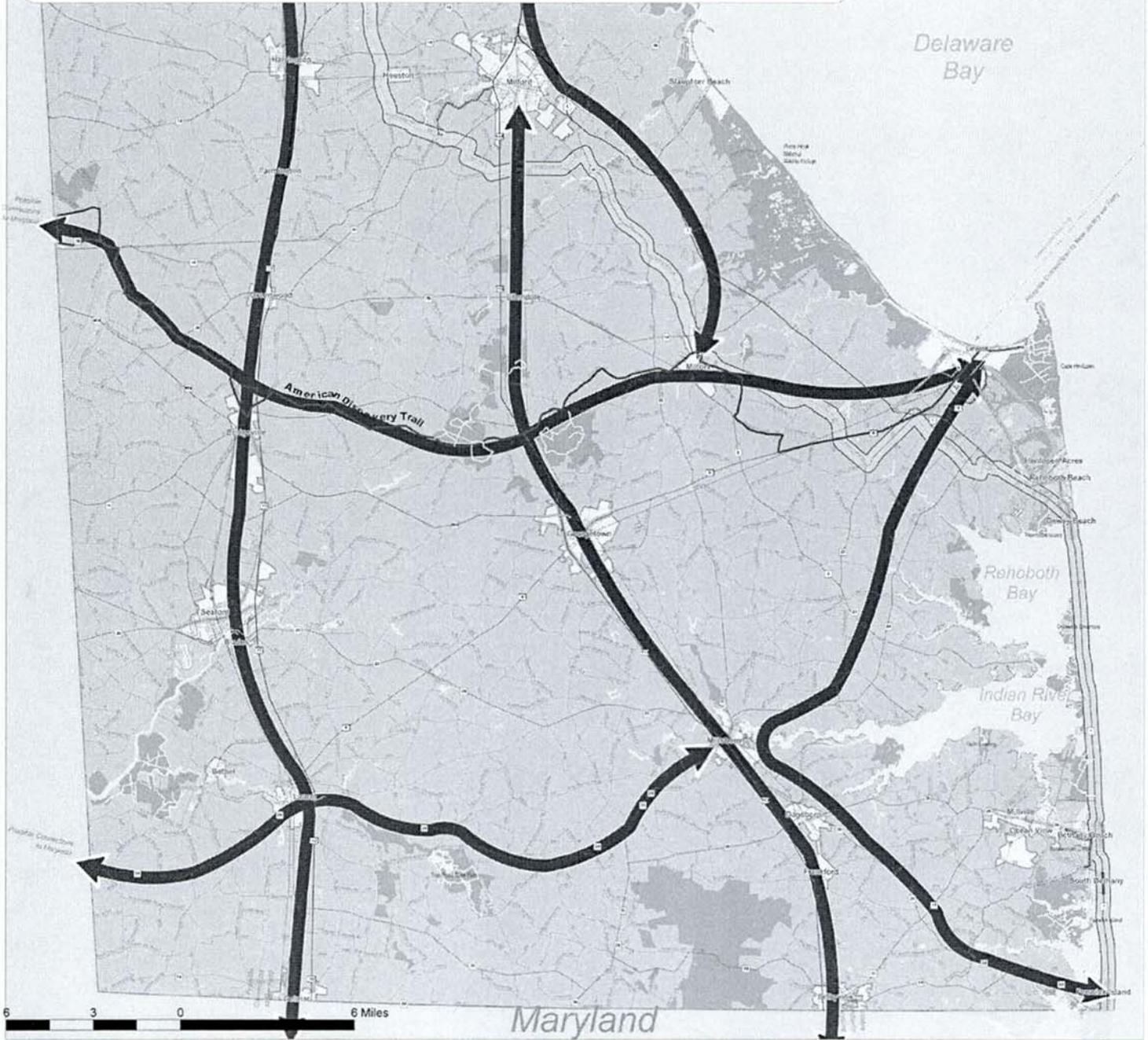
— Bodies of Water

— Municipal Boundaries

— Parks and Other Public Lands

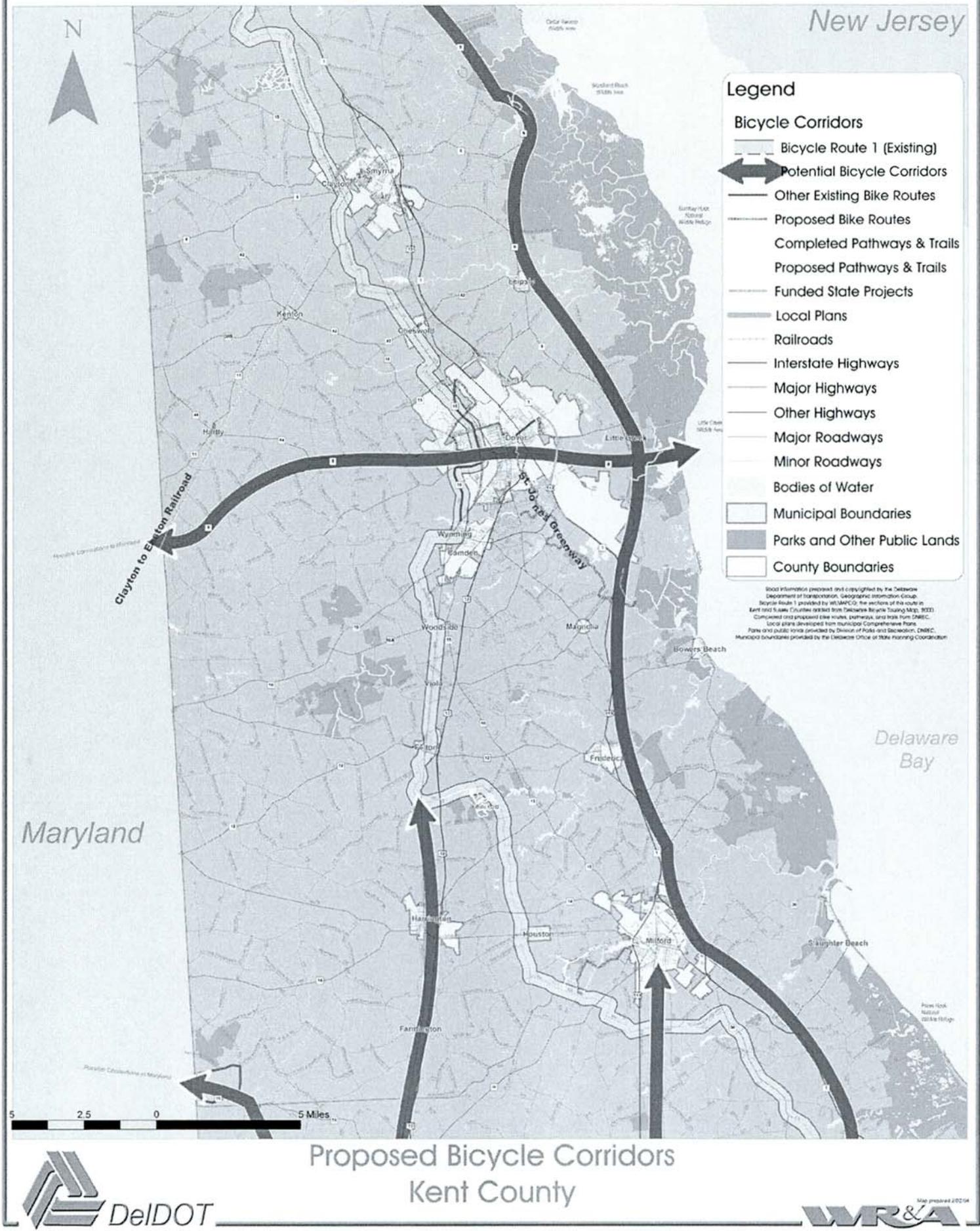
— County Boundaries

Road information prepared and copyrighted by the Delaware Department of Transportation, Geographic Information System. Bicycle Route 1 provided by STRADA/CIT. The location of the route in Maryland, Sussex County taken from Delaware Bicycle Trail Map, 2000. Completed and proposed bike routes, pathways, trails taken from DNRDC. Trails were developed from Municipal Comprehensive Plans. Parks and public lands provided by Director of Parks and Recreation, DNRDC. Municipal boundaries provided by the Delaware Office of State Planning Coordination.



Proposed Bicycle Corridors
Sussex County

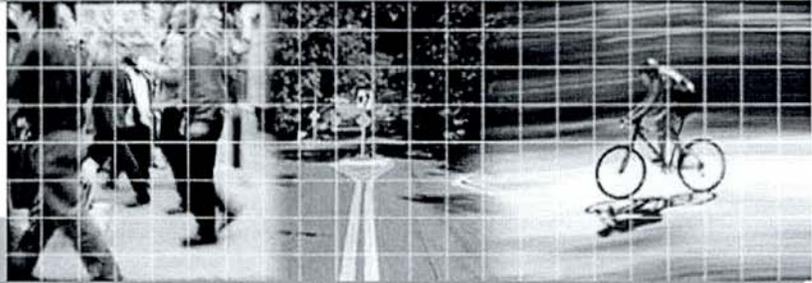
Delaware Bicycle Facilities Master Plan





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Bicycle Areawide Master Plans and Related Projects

State DOTs, MPOs, COGs, cities and counties share a common appreciation for how bicycle and pedestrian trails and greenways contribute to the development of a thoroughly livable and sustainable community. Yet each agency and community needs a master plan created to serve their unique needs. This framework defines goals that are lofty, yet attainable; objectives that are measurable; and strategies that can be effectively implemented.

Since the early 1990s, Sprinkle Consulting has helped develop action plans that establish a blueprint for progress, and provide communities and implementing agencies of all sizes with effective tools to achieve success. These resources help them transform their existing road network into a balanced transportation system. We lead with state-of-the-art:

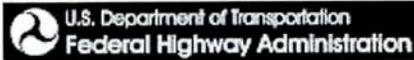
- *Community and Neighborhood Outreach*
- *Community Visioning*
- *Goals and Objectives Setting*
- *Existing Conditions Evaluations*
- *Safe Routes to School Programs*
- *Trends Analysis*
- *Public and Community Leadership Response*
- *Action Plan Development*
- *Progress Tracking*
- *Facilities Planning, Design, Construction and Maintenance*
- *Staff and Advocacy Training*

Projects

- Atlanta Region Bicycle Transportation and Pedestrian Walkways Plan
- Maricopa Association of Governments Regional Bikeway Master Plan
- First Coast MPO Greenways Master Plan
- Baltimore Metropolitan Area Bicycling Conditions and Demand Analysis
- Orlando MetroPlan LRTP Update (Bicycle and Pedestrian Components)

- Long Range Transportation Plan – Gainesville FL
- The Philadelphia Bicycle Plan - PA
- Arizona DOT Statewide Accommodation of Bicycle and Pedestrian Facilities
- Metropolitan Washington DC Area Regional Activity Centers Circulation Systems (TCSP project)
- Maryland Safe Routes to School Program
- CBD Bicycle and Pedestrian Circulation and Parking Study – Anchorage AK
- City of Rockville MD Bicycle and Pedestrian Planning and Design Services
- Characteristics of Emerging Road and Trail Users and Their Safety
- Gainesville-Alachua County Bicycle Master Plan
- Birmingham Area (AL) Bicycle, Pedestrian and Greenway Plan
- Bicycle Pedestrian Regional Master Plan – Ocala-Marion County FL
- JUATS 2025 LRPT Update (Bicycle and Pedestrian Component) - Jacksonville, Florida
- Bicycle Route Network Suitability Study, San Antonio- Bexar County MPO, Texas
- Multi-Modal LOS Standards & Guidelines, Florida DOT
- Anne Arundel County MD Pedestrian and Bicycle Master Plan
- Buffalo NY Regional Bikeways Implementation Plan
- Bicycle Travel Origin-Destination Survey – Las Vegas NV
- Maryland Statewide Bicycle and Pedestrian Master Plan
- Pennsylvania Statewide Greenways Plan
- Ft. Walton Beach Bicycle and Pedestrian Plan, Florida
- District of Columbia Bicycle Master Plan
- Central Pinellas Multi-Modal QOS
- Indian River County MPO Bicycle and Pedestrian Plan, Florida
- Baltimore Region Bicycle, Pedestrian and Greenways Transportation Plan
- St. Lucie MPO Bicycle and Pedestrian Plan, Florida
- St. Petersburg CityTrails™ Bicycle and Pedestrian Plan
- Houston-Galveston Area Bicycle Study
- DelDOT Statewide Bicycle & Pedestrian Planning, State of Delaware
- Comprehensive Bicycle Plan – Hillsborough County FL MPO
- Chicago Regional Bicycle and Pedestrian Plan
- Bicycle Transportation Master Plan – Town of Jupiter FL
- Statewide Bike Plan, Hawaii
- Transportation and Community and System Pilot Preservation Program, Gainesville, Florida
- Northern Virginia Regional Bikeway and Trail System Study, VDOT
- National Highway Institute Bicycle Facilities Design Course
- FHWA Rails-With-Trails Best Practices Report
- Southern Maryland Regional Trail and Bikeway Study
- Bicycle Level of Service Model Development
- Loudoun County VA Bike Ped Mobility Master Plan
- Sarasota Downtown Mobility Study
- Rockville Bikeways Master Plan Update MD
- I-270 Bicycle and Pedestrian Bridge – Metropolitan Washington DC
- Bayway Bridge Integrated Pathway Design – FDOT District 7
- South Lakefront Access Study – City of Chicago DOT
- Collier County Pathways Master Plan
- Facility LOS for the Bicycle Mode
- Jacksonville Regional Greenways Master Plan
- Lake Forest US 41 Bike/Ped Overpass Warrant Study IL
- Areawide Bicycle and Walking Conditions Evaluation - Lexington Fayette Urban County Government KY
- NCHRP 3-70 Multi-modal LOS Analysis for Urban Arterials

- Safer Transportation Network Planning – ICBC British Columbia
- Rockville Millennium Trail Design and Signage Plans MD



United States Department of Transportation Policy Statement on Bicycle and Pedestrian Accommodation Regulations and Recommendations

Signed on March 11, 2010 and announced March 15, 2010

Note: Also available on the [United States Department of Transportation Website](#)

Purpose

The United States Department of Transportation (DOT) is providing this Policy Statement to reflect the Department's support for the development of fully integrated active transportation networks. The establishment of well-connected walking and bicycling networks is an important component for livable communities, and their design should be a part of Federal-aid project developments. Walking and bicycling foster safer, more livable, family-friendly communities; promote physical activity and health; and reduce vehicle emissions and fuel use. Legislation and regulations exist that require inclusion of bicycle and pedestrian policies and projects into transportation plans and project development. Accordingly, transportation agencies should plan, fund, and implement improvements to their walking and bicycling networks, including linkages to transit. In addition, DOT encourages transportation agencies to go beyond the minimum requirements, and proactively provide convenient, safe, and context-sensitive facilities that foster increased use by bicyclists and pedestrians of all ages and abilities, and utilize universal design characteristics when appropriate. Transportation programs and facilities should accommodate people of all ages and abilities, including people too young to drive, people who cannot drive, and people who choose not to drive.

Policy Statement

The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.

Authority

This policy is based on various sections in the United States Code (U.S.C.) and the Code of Federal Regulations (CFR) in Title 23—Highways, Title 49—Transportation, and Title 42—The Public Health and Welfare. These sections, provided in the Appendix, describe how bicyclists and pedestrians of all abilities should be involved throughout the planning process, should not be adversely affected by other transportation projects, and should be able to track annual obligations and expenditures on nonmotorized transportation facilities.

Recommended Actions

The DOT encourages States, local governments, professional associations, community organizations, public transportation agencies, and other government agencies, to adopt similar policy statements on bicycle and pedestrian accommodation as an indication of their commitment to accommodating bicyclists and pedestrians as an integral element of the transportation system. In support of this commitment, transportation agencies and local communities should go beyond minimum design standards and requirements to create safe, attractive, sustainable, accessible, and convenient bicycling and walking networks. Such actions should include:

Considering walking and bicycling as equals with other transportation modes: The primary goal of a transportation system is to safely and efficiently move people and goods. Walking and bicycling are efficient transportation modes for most short trips and, where convenient intermodal systems exist, these nonmotorized trips can easily be linked with transit to significantly increase trip distance. Because of the benefits they provide, transportation agencies should give the same priority to walking and bicycling as is given to other transportation modes. Walking and bicycling should not be an afterthought in roadway design. Ensuring that there are transportation choices for people of all ages and abilities, especially children: Pedestrian and bicycle facilities should meet accessibility requirements and provide safe, convenient, and interconnected transportation networks. For example, children should have safe and convenient options for walking or bicycling to school and parks. People who cannot or prefer not to drive should have safe and efficient transportation choices.

Going beyond minimum design standards: Transportation agencies are encouraged, when possible, to avoid designing walking and bicycling facilities to the minimum standards. For example, shared-use paths that have been designed to minimum width requirements will need retrofits as more people use them. It is more effective to plan for increased usage than to retrofit an older facility. Planning projects for the long-term should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements.

Integrating bicycle and pedestrian accommodation on new, rehabilitated, and limited-access bridges: DOT encourages bicycle and pedestrian accommodation on bridge projects including facilities on limited-access bridges with connections to streets or paths.

Collecting data on walking and biking trips: The best way to improve transportation networks for any mode is to collect and analyze trip data to optimize investments. Walking and bicycling trip data for many communities are lacking. This data gap can be overcome by establishing routine collection of nonmotorized trip information. Communities that routinely collect walking and bicycling data are able to track trends and prioritize investments to ensure the success of new facilities. These data are also valuable in linking walking and bicycling with transit.

Setting mode share targets for walking and bicycling and tracking them over time: A byproduct of improved data collection is that communities can establish targets for increasing the percentage of trips made by walking and bicycling.

Removing snow from sidewalks and shared-use paths: Current maintenance provisions require pedestrian facilities built with Federal funds to be maintained in the same manner as other roadway assets. State Agencies have generally established levels of service on various routes especially as related to snow and ice events.

Improving nonmotorized facilities during maintenance projects: Many transportation agencies spend most of their transportation funding on maintenance rather than on constructing new facilities. Transportation agencies should find ways to make facility improvements for pedestrians and bicyclists during resurfacing and other maintenance projects.

Conclusion

Increased commitment to and investment in bicycle facilities and walking networks can help meet goals for cleaner, healthier air; less congested roadways; and more livable, safe, cost-efficient communities. Walking and bicycling provide low-cost mobility options that place fewer demands on local roads and highways. DOT recognizes that safe and convenient walking and bicycling facilities may look different depending on the context — appropriate facilities in a rural community may be different from a dense, urban area. However, regardless of regional, climate, and population density differences, it is important that pedestrian and bicycle facilities be integrated into transportation systems. While DOT leads the effort to provide safe and convenient accommodations for pedestrians and bicyclists, success will ultimately depend on transportation agencies across the country embracing and implementing this policy.

Ray LaHood, United States Secretary of Transportation

APPENDIX

Key Statutes and Regulations Regarding Walking and Bicycling

Planning Requirements

The State and Metropolitan Planning Organization (MPO) planning regulations describe how walking and bicycling are to be accommodated throughout the planning process (e.g., see 23 CFR 450.200, 23 CFR 450.300, 23 U.S.C. 134(h), and 135(d)). Nonmotorists must be allowed to participate in the planning process and transportation agencies are required to integrate walking and bicycling facilities and programs in their transportation plans to ensure the operability of an intermodal transportation system. Key sections from the U.S.C. and CFR include, with italics added for emphasis:

The scope of the metropolitan planning process "will address the following factors... (2) Increase the safety for motorized and *non-motorized users*; (3) Increase the security of the transportation system for motorized and *non-motorized users*; (4) Protect and enhance the environment, promote energy conservation, improve the quality of life..." 23 CFR 450.306(a). See 23 CFR 450.206 for similar State requirements.

Metropolitan transportation plans "...shall, at a minimum, include...existing and proposed transportation facilities (including major roadways, transit, multimodal and intermodal facilities, *pedestrian walkways and bicycle facilities*, and intermodal connectors that should function as an integrated metropolitan transportation system..." 23 CFR 450.322(f). See 23 CFR 450.216(g) for similar State requirements.

The plans and transportation improvement programs (TIPs) of all metropolitan areas "shall provide for the development and integrated management and operation of transportation systems and facilities (including *accessible pedestrian walkways and bicycle transportation facilities*)." 23 U.S.C. 134(c)(2) and 49 U.S.C. 5303(c)(2). 23 CFR 450.324(c) states that the TIP "shall include ...trails projects, pedestrian walkways; and bicycle facilities..."

23 CFR 450.316(a) states that "The MPOs shall develop and use a documented participation plan that defines a process for providing...representatives of users of *pedestrian walkways and bicycle transportation facilities, and representatives of the disabled*, and other interested parties with reasonable opportunities to be involved in the metropolitan planning process." 23 CFR 450.210(a) contains similar language for States. See also 23 U.S.C. 134(i)(5), 135(f)(3), 49 U.S.C. 5303(i)(5), and 5304(f)(3) for additional information about participation by interested parties.

Prohibition of Route Severance

The Secretary has the authority to withhold approval for projects that would negatively impact pedestrians and bicyclists under certain circumstances. Key references in the CFR and U.S.C. include:

"The Secretary shall not approve any project or take any regulatory action under this title that will result in the severance of an existing major route or have significant adverse impact on the safety for nonmotorized transportation traffic and light motorcycles, unless such project or regulatory action provides for a reasonable alternate route or such a route exists." 23 U.S.C. 109(m).

"In any case where a highway bridge deck being replaced or rehabilitated with Federal financial participation is located on a highway on which bicycles are permitted to operate at each end of such bridge, and the Secretary determines that the safe accommodation of bicycles can be provided at reasonable cost as part of such replacement or rehabilitation, then such bridge shall be so replaced or rehabilitated as to provide such safe accommodations." 23 U.S.C. 217(e). Although this statutory requirement only mentions bicycles, DOT encourages States and local governments to apply this same policy to pedestrian facilities as well.

23 CFR 652 provides "procedures relating to the provision of pedestrian and bicycle accommodations on Federal-aid projects, and Federal participation in the cost of these accommodations and projects."

Project Documentation

"In metropolitan planning areas, on an annual basis, no later than 90 calendar days following the end of the program year, the State, public transportation operator(s), and the MPO shall cooperatively develop a listing of projects (including investments in *pedestrian walkways and bicycle transportation facilities*) for which funds under 23 U.S.C. or 49 U.S.C. Chapter 53 were obligated in the preceding program year." 23 CFR 332 (a).

Accessibility for All Pedestrians

Public rights-of-way and facilities are required to be accessible to persons with disabilities through the following statutes: Section 504 of the Rehabilitation Act of 1973 (Section 504) (29 U.S.C. §794) and Title II of the Americans with Disabilities Act of 1990 (ADA) (42 U.S.C. §§ 12131-12164).

The DOT Section 504 regulation requires the Federal Highway Administration (FHWA) to monitor the compliance of the self-evaluation and transition plans of Federal-aid recipients (49 CFR §27.11). The FHWA Division offices review pedestrian access compliance with the ADA and Section 504 as part of their routine oversight activities as defined in their stewardship plans.

FHWA posted its [Clarification of FHWA's Oversight Role in Accessibility](#) to explain how to accommodate accessibility in policy, planning, and projects.

Additional Resources

For more information about:

FHWA Bicycle and Pedestrian Program Resources

[FHWA's Bicycle and Pedestrian Program](#)
[FHWA guidance documents on walking and bicycling](#)
[Publications related to walking and bicycling](#)
[Information about State and local resources](#)
[Equestrian and Other Nonmotorized Use on Bicycle and Pedestrian Facilities](#)
[Framework for Considering Motorized Use on Nonmotorized Trails and Pedestrian Walkways](#)
[Manuals and Guides for Trail Design, Construction, Maintenance, and Operation](#)
[Recreational Trails](#)
[Shared-Use Paths Along or Near Freeways and Bicycles on Freeways](#)
[Snow Removal on Sidewalks Constructed with Federal Funding](#)
[Federal Aid funding resources for walking and bicycling facilities](#)
[Federal funding spent on walking and bicycling facilities](#)

Accessibility

[FHWA American with Disabilities Act \(ADA\) resources](#)
[U.S. Access Board information about ADA for public rights of way](#)
[Accessibility Guidance for Bicycle and Pedestrian Facilities, Recreational Trails, and Transportation Enhancement Activities](#)

Pedestrian and Bicycle Safety

[FHWA Pedestrian and Bicycle Safety Program](#)
[FHWA Pedestrian and Bicycle Safety Research](#)
The National Highway Traffic Safety Administration's [Pedestrian](#) and [Bicycle](#) Safety Programs

Context Sensitive Solutions

[FHWA and Context Sensitive Solutions](#)

State Bicycle and Pedestrian Contacts

[State Bicycle and Pedestrian Coordinators](#)

To provide Feedback, Suggestions, or Comments for this page contact Gabe Rousseau at gabe.rousseau@dot.gov.

This page last modified on March 19, 2010

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United States Department of Transportation - Federal Highway Administration



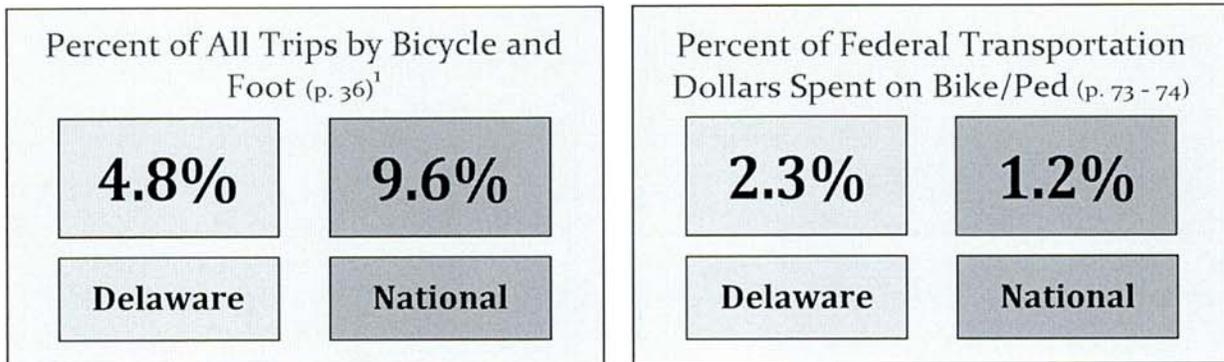
BIKING AND WALKING IN DELAWARE



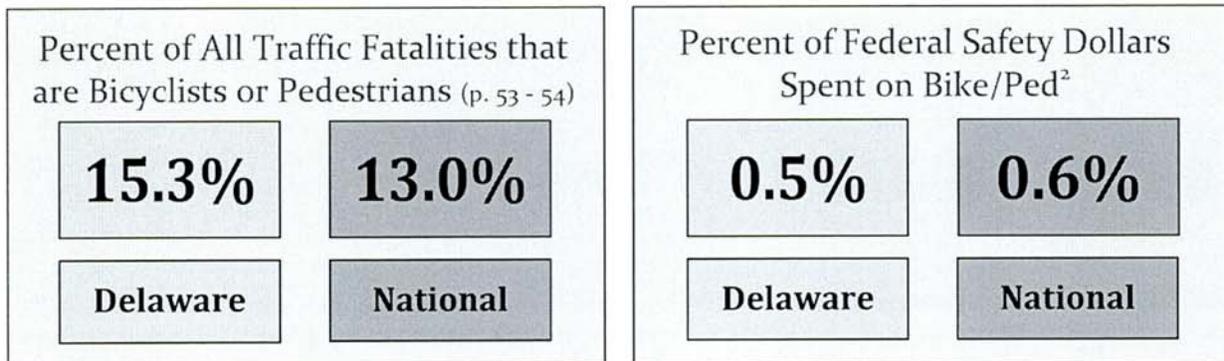
The Alliance for Biking & Walking recently completed their 2010 Benchmarking Report, a collection of bicycling and walking data from all 50 states (www.PeoplePoweredMovement.org/benchmarking).

Check out how your state matches up in:

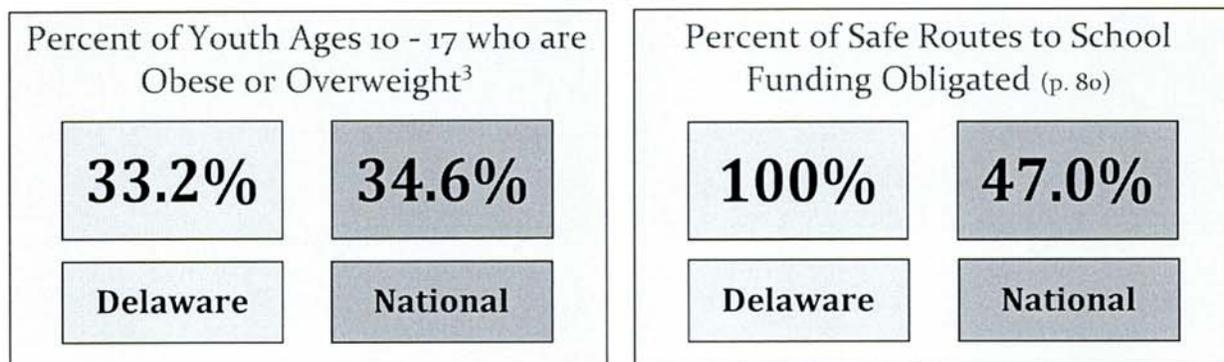
Transportation



Safety



Health



¹ The 2009 National Household Travel Survey (NHTS) reports the national rate is now 12%. The 2001 NHTS national rate of 9.6% is cited here to be comparable with the state data, which was estimated using the 2001 NHTS.

² Federal Highway Administration (FY08 Highway Safety Improvement Program and FY08 Section 402 Funding)

³ Trust for America's Health (<http://healthyamericans.org/states/states.php?measure=overweight>)

Staffing	State Bike/Ped Staff (p. 85)	
	Size of State Bike/Ped Staff (in FTEs*)	State Bike/Ped Staff per Million People
Delaware	4.7	5.4
National Average	4.9	0.8

*Full Time Equivalents



Policy	Is There A State Law Establishing... (p. 65, 71)	
	A Complete Streets Policy	A 3-foot Passing Distance for Cars
Delaware	Yes	No
States Answering Yes	18	14

Education (I)	Does Your State Have... (p. 100)	
	A Share the Road / Public Safety Campaign	Information on Bicycling in Driver's Manual
Delaware	Yes	Yes
States Answering Yes	33	43

Education (II)	Does Your State Have... (p. 100)	
	Driver's Test Questions on Bicycling	A State-Sponsored Ride to Promote Bicycling/Activity
Delaware	No	Yes
States Answering Yes	23	15



For more information, check out the Alliance for Biking & Walking's 2010 Benchmarking Report at:

<http://www.PeoplePoweredMovement.org/benchmarking>



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Benchmarking

Alliance 2010 Benchmarking Report: Information & Findings

[About The 2010 Report](#)

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[Download State Fact Sheets](#)

[Main Conclusions](#)

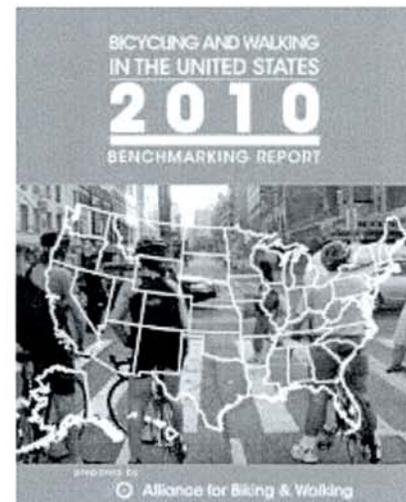
[Project Supporters](#)

[About the Benchmarking Project](#)

[The 2007 Benchmarking Report](#)

About the 2010 Report:

Bicycling and Walking in the U.S.: 2010 Benchmarking Report is an essential resource and tool for government officials, advocates, and those working to promote bicycling and walking. The Benchmarking Project is an on-going effort to collect and analyze data on bicycling and walking in all 50 states and the 51 largest U.S. cities. This second biennial report reveals data including: bicycling and walking levels and demographics; bicycle and pedestrian safety; bicycle and pedestrian policies and provisions; funding for bicycle and pedestrian projects; bicycle and pedestrian staffing levels; written policies on bicycling and walking; bicycle infrastructure including bike lanes, paths, signed bike routes, and bicycle parking; bike-transit integration including presence of bike racks on buses, bike parking at transit stops; bicycling and walking education and encouragement activities; and public



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health indicators including levels of obesity, physical activity, diabetes, and high blood pressure. The report is full of data tables and graphs so you can see how your state or city stacks up. Inside you will find unprecedented statistics to help support your case for increasing safe bicycling and walking in your community. *Bicycling and Walking in the U.S.: 2010 Benchmarking Report* was funded by the Centers for Disease Control and Prevention and made possible through the additional support of Bikes Belong and Planet Bike.

State Fact Sheets

Working with our friends at **America Bikes** (the national coalition of bicycling organizations and leaders working on the federal transportation bill), we have a key new resource for local advocates and decision makers. These 2-page fact sheets distill our nearly 200-page Benchmarking Report into a very user-friendly format for each of the 50 states, comparing key benchmarks at the state level against the national average. This is a great tool to share with decision makers at the local, regional, state, and federal level.

[Expand/Collapse State Fact Sheets...](#)

[Alabama](#) | [Alaska](#) | [Arizona](#) | [Arkansas](#) | [California](#) | [Connecticut](#) | [Colorado](#) | [Delaware](#) | [District of Columbia](#) | [Florida](#) | [Georgia](#) | [Hawaii](#) | [Idaho](#) | [Illinois](#) | [Indiana](#) | [Iowa](#) | [Kansas](#) | [Kentucky](#) | [Louisiana](#) | [Maine](#) | [Maryland](#) | [Massachusetts](#) | [Michigan](#) | [Minnesota](#) | [Mississippi](#) | [Missouri](#) | [Montana](#) | [Nebraska](#) | [Nevada](#) | [New Hampshire](#) | [New Jersey](#) | [New Mexico](#) | [New York](#) | [North Carolina](#) | [North Dakota](#) | [Ohio](#) | [Oklahoma](#) | [Oregon](#) | [Pennsylvania](#) | [Rhode Island](#) | [South Carolina](#) | [South Dakota](#) | [Tennessee](#) | [Texas](#) | [Utah](#) | [Vermont](#) | [Virginia](#) | [Washington](#) | [West Virginia](#) | [Wisconsin](#) | [Wyoming](#)

Main Conclusions:

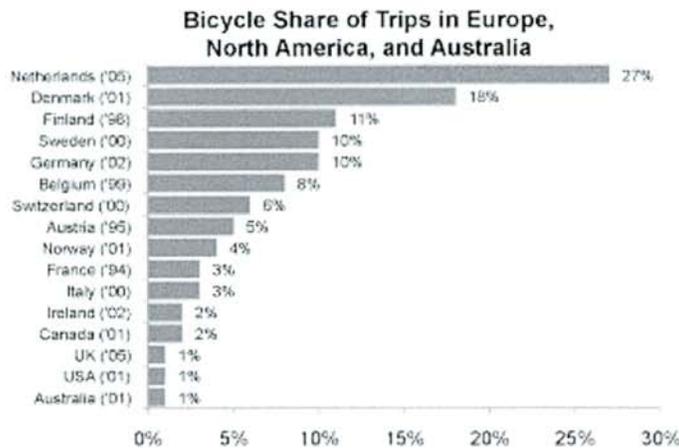
In these times of high gas prices, a warming climate, increasing traffic congestion, and expanding waistlines, increasing bicycling and walking are goals that are clearly in the public interest. As this report shows, where bicycling and walking levels are higher, obesity, high blood pressure, and diabetes levels are lower. Higher levels of bicycling and walking also coincide with increased bicycle and pedestrian safety and higher levels of physical activity. Increasing bicycling and walking can help solve many of the largest problems facing our nation. As this report indicates, many states and cities are making progress toward promoting safe access for bicyclists and pedestrians, but much more remains to be done.

This report has highlighted numerous measures to promote bicycling and walking. There is no silver bullet in regard to making communities more bicycle and pedestrian friendly, and a variety of measures are likely needed. But just as it took a large investment of public money into roads, signals, signs, and education for motorists, so too will it take an ongoing commitment of public investment in bicycling and walking to see major shifts toward these modes.

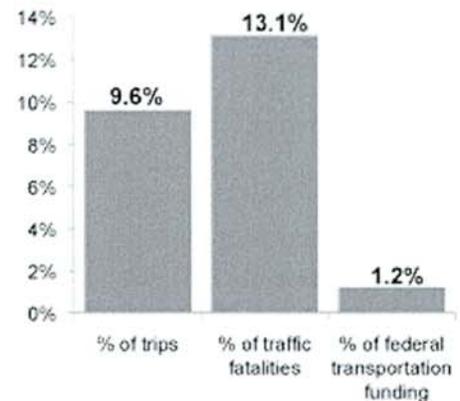
Looking Outside Our Borders

It is also crucial that the U.S. look to other countries to see what mode share levels are possible, and how other international cities have increased bicycling, walking, and safety. One such **comparison by Pucher and Buehler** (chart to right) found the U.S. to have the second lowest bicycle share of trips when compared

to



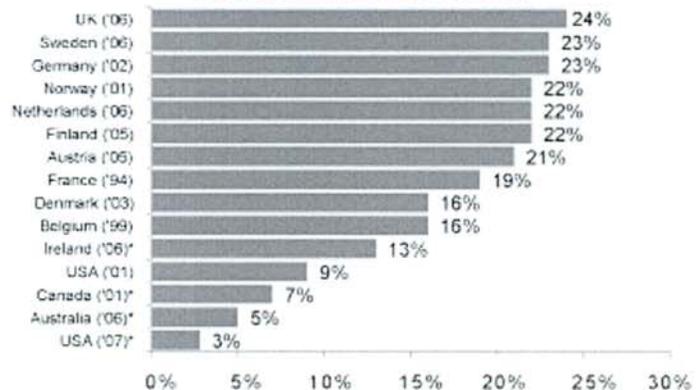
Levels of Bicycling and Walking, Bike/Ped Fatalities, and Bike/Ped Funding in the U.S.



several European countries, Canada, and Australia. Countries like the Netherlands and Denmark with 27% and 18% of trips by bicycle, respectively, are setting the benchmark for what is possible.

The U.S. also lags far behind other countries in regards to walk share of trips. Likewise, a look at international cities (Pucher and Buehler, 2008, chart to right) shows U.S. cities far behind international peers. While benchmarking bicycling and walking in the U.S., it is important to keep an international perspective which reveals the great potential for improvement in this country.

Walk Share of Trips in Europe, North America, and Australia



Increasing Investment in Biking and Walking – What Data Show

Case studies show that the countries and cities that invest the most in bicycling and walking have higher bicycling and walking mode share, and are safer places to bicycle and walk. As this report shows, the U.S. overall has great disparities between bicycling and walking mode share, safety, and funding. Ten percent of trips are by bicycle or foot, yet bicyclists and pedestrians make up over 13% of traffic fatalities and receive just 1.2% of federal transportation dollars. An **international comparison of bicycle funding and mode share** by Gotschi and Mills and Rails to Trails Conservancy (chart to right) found that international cities that invest greater amounts per capita into bicycling have greater levels of bicycling. These cities provide strong evidence that in order to increase bicycling and walking, the U.S. must invest more heavily in these modes.

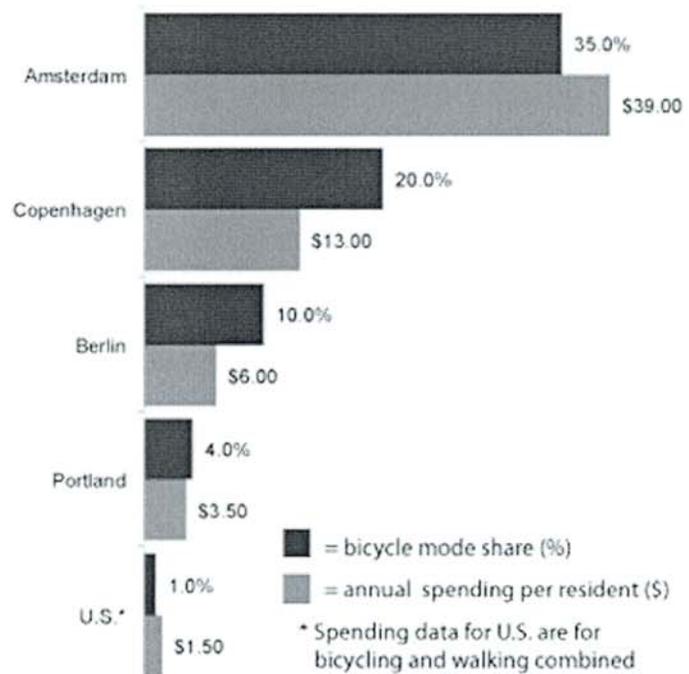
A Multi-Pronged Approach to Promoting Active Transportation and Safety

While greater investment in bicycling and walking is the primary recommendation of this report, there are many other measures that must be taken to simultaneously strengthen public policy, infrastructure, and behavior toward bicycling and walking. Over one-third of the U.S. population is under age 16 (cannot legally drive) or over age 65. Streets designed just to move cars are leaving behind the most vulnerable road users, often making them prisoners in their homes or completely reliant on others to drive them around.

Less than half of states and major U.S. cities have adopted complete streets policies that require that roadways be designed and built with all users in mind. In the absence of a national complete streets policy, the Alliance encourages states and jurisdictions to pursue local policies to begin to transform their local transportation culture and guarantee access for all road users.

Other policies featured in this report, such as education for police officers and the inclusion of bicycling and walking safety in driver education, are also key to shifting toward a bicycle and pedestrian friendly culture. Adult and youth education programs, public awareness campaigns such as "Share the Road," and other promotional efforts can also help raise awareness and change attitudes around bicycling and walking.

Bicycle Funding and Mode Share



Many of the benchmarks featured in this report contribute to making communities more bicycle and pedestrian friendly by changing the built environment, culture, attitudes, and behaviors. But continuous evaluation of efforts to promote bicycling and walking is key to better understanding the relationships between levels of bicycling and walking, safety, policies, provisions, advocacy capacity, and other measures. Benchmarking is a necessary process to better understand these relationships, identify the most strategic areas on which to focus resources, and ultimately to increase these forms of active transportation.

Looking to the Leaders

In the meantime, this report provides plenty of examples of states and cities that are leaders in a variety of efforts to promote bicycling and walking. Appendix 5, page 171, contains a number of resources and models from cities and states in this report. These are presented so that states and cities can have models to look to for inspiration when working towards their goals.

The Benchmarking Report should be used as a tool by cities and states to learn what works best to promote bicycling and walking and what is possible here in the U.S. States and cities can learn from each other's successes and failures and set their goals accordingly. The Alliance encourages all state and city officials to take an active role in benchmarking their efforts to promote bicycling and walking. Even smaller cities that are not included in this report can collect data from their city and compare it to the progress in their own community. There is no doubt that government officials and advocates seeking to grow bicycling and walking have a lot of work ahead of them. But it is crucial for advocates and officials to take the time to evaluate their efforts. While many international benchmarking efforts require huge investments of

government time and money to participate, the Alliance's Benchmarking Project is a free service that requires a relatively small amount of time to complete a survey every two years. With more officials and advocates taking the time to fully participate, this project will become a better source of information and a stronger benchmarking tool for everyone.

If you would like more information about this report, please contact the Alliance at benchmarking@PeoplePoweredMovement.org .

note: The above text and illustrations are extracted and edited from Chapter 9: Conclusion of the 2010 Benchmarking Report

Project Supporters:

"Bicycling and Walking in the U.S." was funded by the **Centers for Disease Control and Prevention** and made possible through additional support from **Bikes Belong Coalition** and **Planet Bike**. Interested in supporting the Benchmarking Project and future reports? Contact Jeff Miller at jeff@peoplepoweredmovement.org .

The 2012 Benchmarking Report:

The next Benchmarking Report is scheduled for publication in January 2012. State and city surveys will be distributed and collected between October 2010 and January 2011. Interested in getting involved? Contact benchmarking@peoplepoweredmovement.org .

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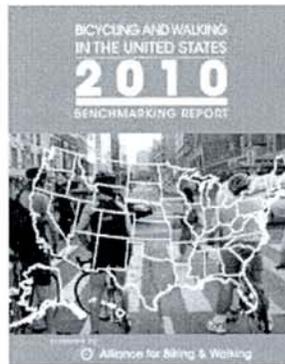
05/13/2010 - BICYCLING AND RUMBLE STRIPS - PROBLEMS FOR CYCLISTS

Alliance > Member Services > Benchmarking

Benchmarking

Alliance 2010 Benchmarking Report: Information & Findings

- [About The 2010 Report](#)
- [Read the Press Release](#)
- [Download the Media Facts Sheet](#)
- [Download State Fact Sheets](#)
- [Main Conclusions](#)
- [Project Supporters](#)
- [About the Benchmarking Project](#)
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About the 2010 Report:

Bicycling and Walking in the U.S.: 2010 Benchmarking Report is an essential resource and tool for government officials, advocates, and those working to promote bicycling and walking. The Benchmarking Project is an on-going effort to collect and analyze data on bicycling and walking in all 50 states and the 51 largest U.S. cities. This second biennial report reveals data including: bicycling and walking levels and demographics; bicycle and pedestrian safety; bicycle and pedestrian policies and provisions; funding for bicycle and pedestrian projects; bicycle and pedestrian staffing levels; written policies on bicycling and walking; bicycle infrastructure including bike lanes, paths, signed bike routes, and bicycle parking; bike-transit integration including presence of bike racks on buses, bike parking at transit stops; bicycling and walking education and encouragement activities; and public health indicators including levels of obesity, physical activity, diabetes, and high blood pressure. The report is full of data tables and graphs so you can see how your state or city stacks up. Inside you will find unprecedented statistics to help support your case for increasing safe bicycling and walking in your community. *Bicycling and Walking in the U.S.: 2010 Benchmarking Report* was funded by the Centers for Disease Control and Prevention and made possible through the additional support of Bikes Belong and Planet Bike.

State Fact Sheets

Working with our friends at **America Bikes** (the national coalition of bicycling organizations and leaders working on the federal transportation bill), we have a key new resource for local advocates and decision makers. These 2-page fact sheets distill our nearly 200-page Benchmarking Report into a very user-friendly format for each of the 50 states, comparing key benchmarks at the state level against the national average. This is a great tool to share with decision makers at the local, regional, state, and federal level.



Who is FHI?

FHI is a multidisciplinary consulting firm focused on providing quality services and products to our clients. Our staff of planners, engineers and scientists have a depth of experience on projects of many sizes for both public and private clients. Our core services include environmental planning, transportation planning, cultural resource investigations, GIS mapping and analyses, community and site planning, and public involvement. Supporting both our environmental and transportation planning capabilities, we provide a broad range of bicycle and pedestrian planning services.

FHI's Bicycle and Pedestrian Services

- Statewide Planning
- Access to Transit
- Bicycle and Pedestrian Design
- Ordinance Review/Development
- Safety Reviews
- Safe Routes to School
- Pedestrian Scale Lighting
- Traffic Calming
- Traffic and Pedestrian Flow Analysis
- Corridor Planning
- Pedestrian Surveys
- GIS Technology

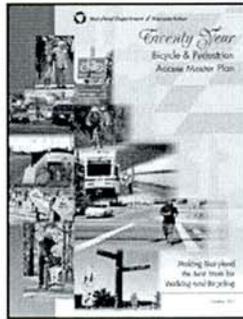
Pedestrian and Bicycle Project Experience

- Municipal Plans
- Urban Design
- Master Planning Projects
- Corridor Studies
- Site Development
- Safe Routes to School
- Transit Studies
- Station Area Planning
- Model Ordinances
- Environmental Documentation

Core Services

- Transportation Planning
- Environmental Planning
- Historical/Cultural Documentation
- Public Involvement
- Community/Site Planning
- GIS Analysis

Statewide Planning



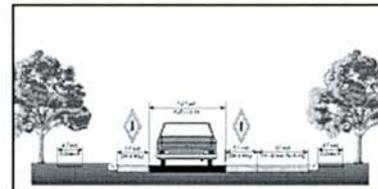
State leadership for bicycle and pedestrian planning is critical for the creation of accessible networks along state-owned right of ways. FHI has provided statewide bicycle planning services in three states for specific bike/ped policy plans and in three others where bicycle and pedestrian travel is an important component of the overall statewide transportation plan. Our staff members bring a wealth of experience in evaluating and assessing the important policies that help incorporate bicycle and pedestrian travel into the state transportation system. We also possess the ability to apply the technology available to assess statewide needs, providing state agencies with the tools they need to identify and prioritize improvements.

Ordinance Review/Development

Land use regulation is one of the primary tools local governments have for promoting bicycle and pedestrian access in private developments within their jurisdictions, which help to create desirable communities. FHI has extensive experience applying our strong understanding of land use and zoning issues to planning for bicycle and pedestrian facilities. The range of expertise we offer includes analysis of existing regulations, development of model regulations, expert testimony, and assessment of the impacts of current zoning and other ordinances on future development patterns. Our skills in GIS enhance these analyses by providing spatial analysis and mapping functions that can be key for illustration, increasing the understanding of both decision makers and the public.

Bicycle and Pedestrian Design

FHI staff is conversant in published design guidelines and their application in various real-world situations. Our staff has provided design services for trails, roadway intersections, pedestrian improvements (bulb-outs, refuge islands), signing and striping, lighting and Americans with Disabilities Act (ADA) improvements. Past work has included preparing overviews of nationwide bicycle and pedestrian design guidelines for use by state transportation professionals. Our expertise enables us to provide design alternatives that meet published design criteria and are implementable under federal and state guidelines.



Contra-flow bikeway, College of William and Mary

Safety Reviews

A comprehensive understanding of local conditions helps in the formulation of a plan for improving the safety of all travel modes. Our staff has conducted a number of bicycle and pedestrian safety reviews for roadways of various classification, from neighborhood to principal arterial. Safety reviews have included assessment of crash data, signal timings, roadway geometry, and traffic operations. FHI has conducted various data collection activities to obtain necessary information, including videotaping, site observations, and field measurements. We have the ability to interpret data, confer with roadway design engineers, and interact with agencies and the public to help formulate safety improvement plans for all travel modes.

GIS and Other Technologies

GIS is an important technology for bicycle and pedestrian planning on several levels. Our GIS experience has included spatial and mapping analyses to determine expected travel demand, potential greenway corridors, bicycle level of service or capacity indexes, and to illustrate existing and planned network improvements. FHI also uses GIS technology to conduct visual impact assessments of infrastructure improvements on communities, including historic downtowns. Whether making maps or evaluating data, our products are oriented as decision making tools. FHI has gained increasing recognition for our expertise in websites and web-based technologies as an outlet for public interface and information exchange on bicycle and pedestrian projects, providing a better opportunity for interested parties to provide input to the planning process.

(Continued)

Bicycle and Pedestrian Planning



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Access to Transit



Analysis of transit access, No. Virginia

The key to successful transit is to provide seamless integration with the surrounding community. FHI brings together multidisciplinary expertise to help transportation agencies connect with communities. Our attention to the human experience and livability issues combined with our application of technical methodologies and public involvement brings excellence to project teams. Our traffic engineers are well versed in traffic calming and pedestrian accommodation, our transit operations specialists address parking needs, and our land use specialists craft zoning recommendations for improving circulation in the community. This multidisciplinary approach enhances a true multimodal view of facilitating access to transit.

Pedestrian Scale Lighting

Our engineering staff has the capability to assess existing or proposed lighting that can significantly improve safety for bicyclists and pedestrians. Our expertise includes both corridor level and site-specific lighting improvements. FHI maintains an up to date library of commercially available lighting equipment from numerous manufacturers and staff is familiar with standard practices relative to Illuminating Engineer Society and AASHTO guidelines. We are able to use industry standard photometric analysis software to effectively model alternative lighting configurations and illustrate those configurations specifically accommodating the needs of bicyclists and pedestrians.

Traffic Calming

Communities and neighborhoods around the country are struggling with high volumes or high speeds of automobile traffic that have created places unsafe for bicycling and walking. FHI has worked with neighborhoods, municipalities, and state transportation agencies to identify means by which to improve safety for all modes through application of traffic calming practices. We are familiar with state of the practice traffic calming measures and standards. We have led public outreach efforts, recommended specific improvements, and crafted local ordinances to optimize the design of more livable corridors and communities.

Traffic and Pedestrian Flow Analysis

Our traffic engineering staff provides traffic analysis services for projects of varying scope. We have extensive experience analyzing high-volume pedestrian traffic in environments such as transit stations, resorts, college campuses, and highly urbanized central business districts or commercial corridors. Our expertise includes special consideration to the placement of crossings, ADA ramps, sidewalk offsets, channelization of pedestrians via physical features, and pedestrian signal timings. FHI's expertise with access management, traffic calming, and design of signing and pavement marking further enhances our capabilities in identifying and analyzing pedestrian safety issues.



Intersection analysis, Dewey Beach, Delaware

Corridor Planning

Corridor improvement projects often have a strong element involving the improvement or provision of bicycle and pedestrian infrastructure in areas where they were previously lacking or deficient. Our staff has worked on many planning projects for roadway and transit corridors that have included a focus on improving conditions for walking and bicycling. FHI has developed corridor management plans, access management plans, and bicycle and pedestrian access plans for corridor projects. FHI has also planned multiuse paths to be used as an alternative transportation mode in major automobile or transit corridors.

Representative Bicycle and Pedestrian Planning Projects

- Leesburg Pike Pedestrian Bridge Feasibility Study, VA
- Route 7 Pedestrian and Bicycle Trail, CT
- Statewide Bicycle Route Inventory, VA
- Landrum Drive Bikeway Study, VA
- Stamford Multimodal Transportation Center, CT
- MDOT Statewide Bicycle and Pedestrian Plan, MD
- Delaware Statewide Bicycle Facilities Plan, DE
- Economic Impact of Bicycling in Virginia, VA
- Little Creek Road Traffic Signal Optimization, VA
- Delaware Statewide Pedestrian Plan, DE
- Route 202 Corridor Management Plan, CT
- State Bicycle Plan, VA
- Southington Rails to Trails, CT
- Downtown Hartford Circulation Project, CT
- Richmond Bicycle/Pedestrian Study, VA
- Maryland Statewide Bicycle and Pedestrian Master Plan, MD
- Safe Routes to Schools, MD
- Bridgeport Intermodal Transportation Center, CT
- Dulles Corridor Rapid Transit Project Draft Environmental Impact Statement, VA
- Northern Virginia Bicycle and Trail Network Plan, VA
- Route 1 Beach Area Improvements, DE
- Hartland Three Corners Cultural Resource Review, VT
- Route 35 Corridor Planning Study, CT
- I-270 Multi-Modal Corridor Study, MD



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 Dover, DE 19903
 (302) 760-BIKE

Amy Wilburn, Chair

Bicycling in Delaware » Delaware Bike Laws

Delaware Legislation will Protect Cyclists and Pedestrians (posted to site August 4, 2003)

Abby Reichardt of Dover, DE, felt "betrayed" by the justice system when the driver of a truck that struck and killed her father had his charge reduced from criminally negligent homicide to careless driving, a misdemeanor offense with a potential maximum sentence of a \$115 fine and 30 days in prison. Her father, Warren G.H. Pritchett Jr., was struck from behind by a truck while bicycling along a rural road last November 20.

When she learned of the reduced charge, Reichert contacted every officeholder who could possibly help change the law. She was greatly assisted by Don Carbaugh, chairman of the Delaware Bicycle Council, an appointed body that advises the governor on bicycle-related issues. Recently, the Delaware State Senate passed HB190, the Warren G.H. Pritchett Jr. Act, which was signed by Governor Ruth Ann Minner, closing a gap in the Delaware legal code that had allowed some drivers to face little more than a reckless driving charge when involved in a crash, even if their actions caused the death of another person. The Act adds an unclassified misdemeanor to the state's traffic code, and provided a first-offense penalty of a maximum \$1,150 fine and 30 months imprisonment. For more detailed information see the original story in the Dover Post.

(Reprinted by permission from the League of American Bicyclist e-newsletter)

In 1995 the state legislature passed a helmet law which took effect April 1, 1996. This law requires all children under age 16 to wear a helmet while bicycling or in a trailer or child bicycle seat and establishes a bicycle helmet bank to provide free helmets to low income children who cannot afford to buy helmets. Other states have bicycling laws online.

Child Bicycle Helmet Law (HB 57)

Effective April 1, 1996 a person under sixteen years of age shall not operate, ride upon, or ride as a passenger any bicycle, unless that person is wearing a properly fitted and fastened bicycle helmets which meets or exceeds the ANSI Z90.4 bicycle helmet standard (or subsequent standard) or the Snell Memorial Foundation's 1984 Standard (or subsequent standard) for Protective Headgear for Use in Bicycling. This requirement shall apply to a person who rides upon a bicycle while in a restraining seat which is attached to the bicycle or in a trailer towed by the bicycle. This requirement applies at all times while a bicycle is being operated on any property open to the public or used by the public for pedestrian and vehicular purposes.

Any guardian who fails to cause his child to wear a bicycle helmet shall be fined for the first offense \$25, and for each subsequent offense \$50. The court may dismiss all charges if presented evidence that a violator has purchased or obtained a bicycle helmet meeting the standards mentioned above.

Bicycle Helmet Bank and Bicycle Safety Education Programs

The helmet law also led to the formation of a bicycle helmet bank to provide free helmets to children who cannot afford to buy helmets. Helmets are available through the public schools. For more information call 760-BIKE.

Also, the law called for expansion of the University of Delaware Cooperative Extension Service's BIPED safety education program. Now every elementary and middle school in the state is offered a program on bicycle safety presented by volunteers from area bicycle clubs and other

volunteers. For further information, contact Mark Manno in New Castle County at 831-8965. In Kent county please contact John Urban at (302) 697-4000 and in Sussex county please contact Ron Jester at (302) 856-7303 or Diaz Bonville.

Other Delaware Bicycling Laws:

1. Parents and guardians shall not authorize or permit violation of these laws by the child or ward.
2. Every person riding a bicycle shall have all the rights and responsibilities of a driver of any other vehicle.
3. No bicycle shall carry more persons than it was designed to carry, except an adult rider may carry a child securely attached in a back pack or sling.
4. A trailer or semitrailer may be securely attached to a bicycle.
5. Persons riding a bicycle, coaster, roller skates, sled or toy vehicle shall not cling to another vehicle upon the highway.
6. When traveling less than the normal speed of traffic a bicycle shall be ridden "as close as practicable" to the right-hand edge of the roadway except: a) When passing another bicycle or vehicle, b) When making a left-hand turn, c) When avoiding parked or slow moving vehicles, fixed or slow moving objects, animals, surface hazards, etc., or d) When the lane that is narrow for a bicycle and a vehicle to travel safely side by side within the lane.
7. Riding no more than two abreast is permitted only within a single lane and when not impeding the normal and reasonable movement of roadway traffic.
8. A person riding a bicycle shall have both hands available to operate the bicycle. At least one hand shall be kept on the handlebars at all times. A one-armed person may ride a bicycle and must use mechanical turn signals.
9. Left turns shall be permitted according to:
 - a. Normal motor vehicle type of left turn procedure
 - b. Approach the turn on the right edge of the roadway, cross the intersecting roadway, stop out of the way of traffic, yield to all vehicles and pedestrians, obey all traffic control devices and then proceed in new direction.
 - c. Special traffic control devices
10. The right arm may be used to signal right turns
11. Right and left turn signals shall be given not less than 100 feet from turn and while stopped waiting to turn. Such signals may be given intermittently, rather than continuously, if the hand giving the signals is needed to control the bicycle.
12. A person riding a bicycle on a sidewalk or in a crosswalk shall yield to pedestrians and give an audible signal before overtaking.
13. A person shall not ride a bicycle on a sidewalk or crosswalk when prohibited by official control devices.
14. A person riding a bicycle on a sidewalk, or pushing a bicycle across the road at a crosswalk shall have all the rights and responsibilities of a pedestrian.
15. A bicycle may be parked on a sidewalk except when prohibited by official control devices or when impeding the normal and reasonable movement of sidewalk traffic.
16. Bicycles may be parked where vehicle parking is allowed.
17. Bicycles may not be parked in such a way as to obstruct the movement of a legally parked motor vehicle.
18. A uniformed police officer may stop, inspect and test a bicycle that is suspected to be unsafe or to have improper equipment
19. When riding at night, a bicycle shall be equipped with a front, white light visible for at least 500 feet from a motor vehicle with lawful low beam head lamps.
20. Every bicycle shall be fitted with a rear, red reflector visible for at least 600 feet from a motor vehicle with lawful low beam head lamps.
21. When riding at night, a bicycle shall be equipped with reflective material visible from both sides for at least 600 feet, or a lighted lamp visible from both sides for at least 500 feet, from a motor vehicle with lawful low beam head lamps.
22. A bicycle and its rider may be equipped with additional lights and reflectors.
23. Every bicycle shall be equipped with brakes that are capable of stopping the bicycle within 25 feet from a speed of 10 mph on dry, clean level pavement.
24. Every bicycle sold at retail shall have a permanent identification number stamped or cast on its frame.
25. A person riding a bicycle shall not wear ear plugs in both ears or a headset covering both

ears.

26. A person who is hard of hearing may wear a hearing aid while riding a bicycle

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