

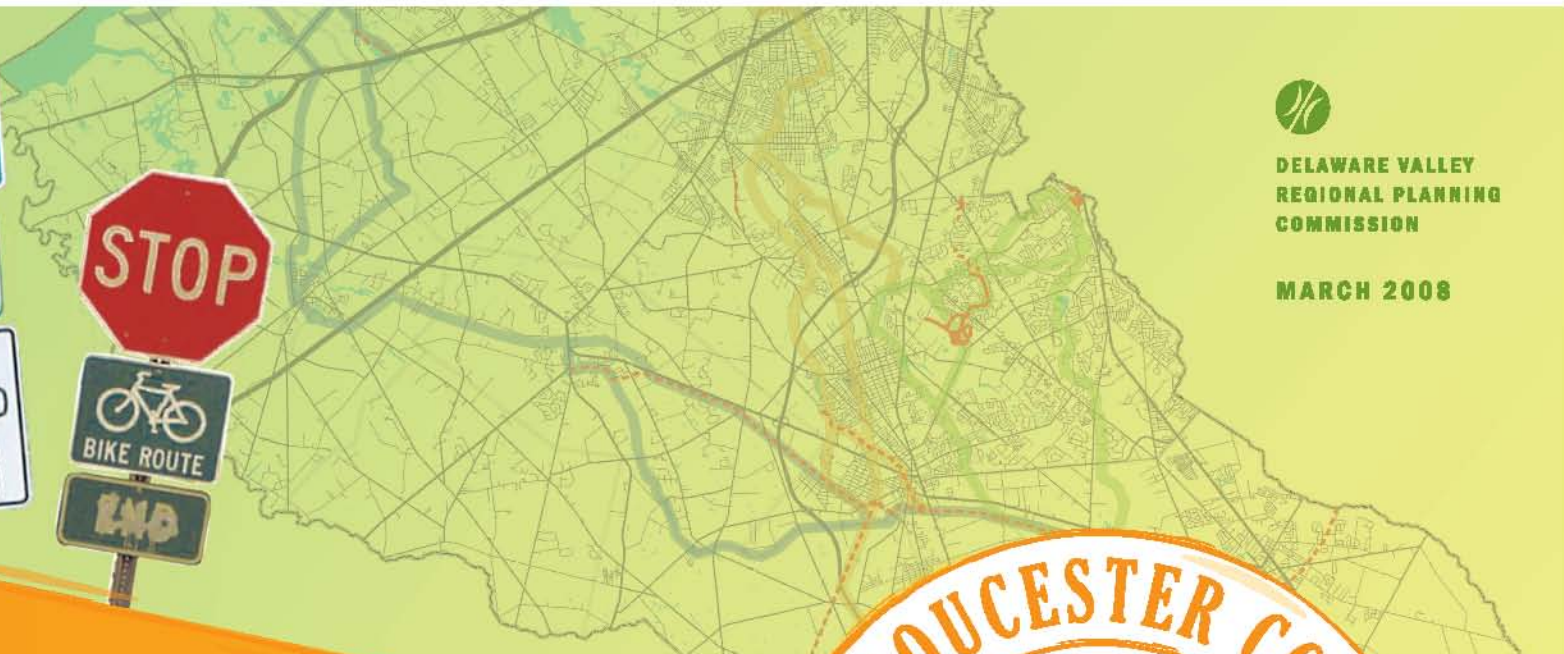


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DELAWARE VALLEY
REGIONAL PLANNING
COMMISSION

MARCH 2008





Delaware Valley Regional Planning Commission

Created in 1965, the Delaware Valley Regional Planning Commission (DVRPC) is an interstate, intercounty and intercity agency that provides continuing, comprehensive and coordinated planning to shape a vision for the future growth of the Delaware Valley region. The region includes Bucks, Chester, Delaware, and Montgomery counties, as well as the City of Philadelphia, in Pennsylvania; and Burlington, Camden, Gloucester and Mercer counties in New Jersey. DVRPC provides technical assistance and services; conducts high-priority studies that respond to the requests and demands of member state and local governments; fosters cooperation among various constituents to forge a consensus on diverse regional issues; determines and meets the needs of the private sector; and practices public outreach efforts to promote two-way communication and public awareness of regional issues and the Commission.

Our logo is adapted from the official DVRPC seal, and is designed as a stylized image of the Delaware Valley. The outer ring symbolizes the region as a whole, while the diagonal bar signifies the Delaware River. The two adjoining crescents represent the Commonwealth of Pennsylvania and the State of New Jersey.

DVRPC is funded by a variety of funding sources including federal grants from the U.S. Department of Transportation's Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), the Pennsylvania and New Jersey departments of transportation, as well as by DVRPC's state and local member governments. The authors, however, are solely responsible for its findings and conclusions, which may not represent the official views or policies of the funding agencies.

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Contents

Executive Summary	1
1. Introduction	2
Study purpose and scope	8
2. Inventory of Plans & Conditions	11
<i>Inventory of trail network development opportunities</i>	13
Existing, planned and proposed trails and bikeways	13
Potential trail alignments	14
Greenways	15
Bicycle-friendly county and state highways	15
<i>Location of demand for trails and bikeways</i>	20
Trip attractions	20
Crash history as an indicator of existing travel	20
Commuting	21
Matching supply and demand	22
3. Proposed Trail Network	24
Gloucester County Trail	27
Delaware Estuary Trail	37
Towns & Trains Trail	43
Little Ease Trail	53
4. Implementation	59
Appendix A: Bicycle facility planning and design	

List of Figures

Figure 1: 2030 Regional Trails Network, Southern New Jersey	13
Figure 2: Bicycle Level of Service on county roads	16
Figure 3: Prioritization of state highway network for pedestrian crossing improvements	22
Figure 4: Prioritization of state highway network for bicycling improvements	23
Figure 5: Future multi-use trails network – alignment opportunities	25
Figure 6: Interim bike routes	26
Figure 7: Trail development process	59

List of Tables

Table 1: Bicyclist-involved crashes, Gloucester County, 1997-2001, by municipality	20
Table 2: Bicyclist-involved crashes, Gloucester County, 1997-2001, by route	21
Table 3: Interim (short-term) route alignment, Gloucester County Trail	34
Table 4: Permanent alignment, Delaware River Route	41
Table 5: Interim (short-term) route alignment, Towns & Trains Trail	50
Table 6: RiverWinds Spur	51
Table 7: Interim (short-term) route alignment, Little Ease Trail	56
Table 8: Implementation: Gloucester County Trail	63
Table 9: Implementation: Little Ease Trail	63
Table 10: Implementation: Towns & Trains Trail	64

Executive Summary

DVRPC was asked by the Gloucester County Planning Division to examine opportunities for the creation of a county-wide network of routes for non-motorized travel serving important destinations including open spaces, recreational areas, employment centers, schools, transportation facilities, and existing trails. This report presents the results of that study, culminating with a sketch plan for a network of four cross-county routes:

- Gloucester County Trail, following an east-west alignment incorporating the existing Gloucester County rail-to-trail and the proposed Raccoon Creek greenway;
- Delaware Estuary Route, an on-road bike route linking communities along the Delaware River;
- Towns and Trains Trail, linking the county's oldest settlements from Woodbury to Glassboro and beyond; and
- Little Ease Trail, connecting the growing trail system of suburban Washington Township with natural areas to the south.

The network will be comprised of multi-use trails to the maximum extent possible, incorporating existing trails; disused, abandoned and active rail rights of way; utility easements, open space corridors, and highway rights of way, using shared roadways where needed to connect discontinuous trail segments and link nearby destinations. For each route, an interim alignment using existing roads and trails is recommended for immediate signing, to create a public identity; and potential off-road trail alignments are described. An implementation strategy and preliminary construction costs for each route are presented.

SECTION 1: INTRODUCTION AND SCOPE

Introduction

Suburban residents typically experience the place where they live from behind a windshield. In metropolitan suburbs like Gloucester County, the most memorable feature becomes the traffic congestion, followed closely by the roadside commercial landscape. Trails offer a different experience, another view of the places we inhabit, a discovery of the hidden, overlooked, and often beautiful sites within our midst.

Gloucester County offers much for an adventurous explorer: bucolic vistas of corn fields and peach orchards, giant industrial works and rusting relics, sweeping riverbluff views, the passing of large ships, Victorian towns, serene estuaries, forested wetlands, glimpses of wild turkey and whitetail deer, tea-colored lakes, Revolutionary War earthworks, and houses inhabited since the colonial era.

DVRPC was asked by the Gloucester County Planning Division to examine opportunities for the creation of a county-wide network of routes for non-motorized travel. This report presents the results of that study, culminating with a sketch plan for a network of four cross-county routes. The proposed route network will entice residents and visitors alike to explore the county's varied landscapes in an intimate way -- by bicycle and on foot.

The network will be comprised of multi-use trails to the maximum extent possible, incorporating existing trails; disused, abandoned and active rail rights of way; utility easements, open space corridors, and highway rights of way, using shared roadways where needed to connect discontinuous trail segments and link nearby destinations. For each route, an interim



Tourist information sign, National Park Source: DVRPC, 2005

alignment using existing roads and trails is recommended for immediate signing, to create a public identity; and potential off-road trail alignments are described. An implementation strategy and preliminary construction costs for each route are presented.

Multi-use trails are in essence, independent roadways intended exclusively for non-motorized travelers such as those on bicycle, roller-blade, foot, and sometimes horseback. Motorized traffic is prohibited, except where intersected with other roadways.

Trails are sometimes confused with *greenways*, or linear strips of preserved open space dedicated for recreation, natural resource protection, and wildlife habitat. Trails are often built within greenways, typically along stream floodplains; they may also be built along utility easements and abandoned railbeds. When a trail lies within a roadway right of way, it is separated from the roadway by a physical barrier, landscaping, or grass strip; for the most part, free of intersecting driveways; and has infrequent street crossings.

Multi-use trails, so-called because they are used via a variety of modes, are distinct from *bike lanes*, which, through pavement markings and signs on roadways open to motorized traffic, serve to channel roadway traffic and make the movement of bicyclists more predictable to motorists. *Bike routes* are essentially systems of navigational signage guiding bicyclists along a preferred route which may include trails, as well as, local streets and highways with or without bike lanes. *Bikeways*, a generic term referring to any traveled way intended for bicycles, include trails and all manner of roads, with or without bike lanes, signed as a bike route or not, where bicycling is permitted.



Trail marker logo
Source: MCPC, 2007



Trailside information, Perkiomen Trail, Montgomery Co., PA
Source: DVRPC, 2004

SECTION 1: INTRODUCTION AND SCOPE



Radnor Trail, Wayne, PA, on a weekday afternoon

Source: DVRPC, 2006

This report recommends both the development of trails and their incorporation into cross-county routes; and the development of interim routes using primarily existing roadways.

Gloucester County's request for this study reflects a growing interest in trail development in the DVRPC region, the state, and across the country. DVRPC's regional long-range plan proposes a trail network for the year 2030. The state has recently updated its policy-oriented State Trails Plan. The Greater Philadelphia Tourism Marketing Corporation has begun to market the region's outdoor recreation assets – with trails being a key component – in its “Think Outside” campaign.

Montgomery County, Pennsylvania, is the regional leader in trails development with a planned 160-mile countywide trails network, with the political backing to condemn land, when necessary, to get the job done. Thus far 34 miles of trails have been opened, and the county Planning Commission anticipates the opening of 28 additional miles in 2007¹. Some trails are very popular and at certain times become congested with users.

The timing of the release of this report is fortuitous, coinciding with a major initiative to market and develop trails regionally. Funded through a grant from the William Penn Foundation, the National Park Service and the Rails to Trails Conservancy have initiated an effort called the Camden Metro-Region Trail Strategy to raise public awareness and acceptance of trail development in Philadelphia's New Jersey suburbs. The project's scope also includes the identification and involvement of natural allies for

¹ Montgomery County Planning Commission web site, <http://trails.montcopa.org/trails/cwp/view,a,1481,q,35001.asp>, 8/30/06.

trail development, including professionals and leaders in tourism, economic development, public health, and transportation. The work will culminate in a regional trails vision and plan.

The market for trails. Bicycling is among the most popular forms of recreation. Hundreds of bicyclists can be counted passing a single point in one hour along the Wildwood boardwalk on a typical summer morning. Locally, more than 5,000 people of all ages gather at PATCO's Woodcrest station on the third Saturday in September to begin the two-day, 150-mile round-trip Multiple Sclerosis City to Shore bike ride to Ocean City. One can witness a steady stream of bicyclists doing laps around Cooper River Park in Cherry Hill, Camden County, on any afternoon with pleasant weather.

Vacation destinations, large event rides, and heavy use of locally popular routes are exceptional, however. Bicycling makes up a very small proportion of total travel within the study area, as it does typically in the suburban portions of major metropolitan areas nationwide.

Nationally, a mere 0.2 percent of utilitarian, non-recreational trips (primarily for commuting and shopping) are made by bicycle. Only 1.6 percent of all trips made for social or recreational purposes are by bike (1990 Nationwide Personal Transportation Study, US Department of Transportation).

Nearly 80 percent of adult Americans take at least one walk of five minutes or longer during the summer months, while fewer than 30 percent ride a bike, according to a public opinion survey by U.S. Department of Transportation.²

² The "National Survey of Pedestrian and Bicyclist Attitudes and Behaviors" involved phone interviews with more than 9,600 adults age 16 and older throughout the U.S. con-



Club ride, Woolwich Source: DVRPC, 2004



Sidewalk rider, Woodbury Source: DVRPC, 2001

SECTION 1: INTRODUCTION AND SCOPE



Child bicyclists, Monroe Bike Path

Source: DVRPC, 2001

The survey, conducted jointly by the Bureau of Transportation Statistics (BTS) and the National Highway Traffic Safety Administration (NHTSA) during the summer of 2002, provides a tentative answer for the disparity between the amount of bicycling and walking: only half of all adults are satisfied with their communities' designs for bicycling safety, whereas three out of four adults are satisfied with their communities' designs for pedestrian safety.

Survey respondents were asked to recommend changes to their communities for either bicycling or walking. Most persons suggested changes in bicycle and pedestrian facilities. For those recommending changes, 73 percent wanted new bicycle facilities, such as trails, bicycle lanes, and traffic signals, and 74 percent wanted pedestrian facilities including sidewalks, lighting, and crosswalks.

Bicyclists may be categorized according to three types: Advanced, Basic adult, and Child. Advanced bicyclists, although a minority of all bicyclists, account for most of the bicycle miles traveled but the fewest crashes. They may participate in club rides, sometimes over great distances. They are comfortable bicycling in traffic, operating as vehicle drivers. Typically able to maintain speeds of 15 to 20 m.p.h., they will take the most direct route to their destination, preferring streets and highways over trails.

The majority of adult bicyclists fall into the category called Basic. As casual or occasional riders, Basic riders are typically averse to, and some-

ducted during a 10-week period in the summer of 2002. Participants were asked if they took a walk or a bicycle ride during the previous 30 days. The margin of error for the survey is +/-1.5 percentage points. An electronic version of the report with more details is available at www.bicyclinginfo.org or www.walkinginfo.org.

times fearful of, operating in mixed traffic. Represented in this category are those who do not understand how to operate a bicycle as a vehicle, or choose not to do so. They shy away from busy, high speed roads, instead preferring residential streets and paths; but may use a more heavily traveled roadway if shoulders or bike lanes are present.

Child bicyclists, under the age of 12, have not yet acquired the physical, cognitive, and emotional maturity required to operate safely in traffic. Their riding is typically restricted to neighborhood streets, sidewalks, and trails.

Well-designed trails may attract all three types of rider. Typically, however, bicyclists make up only about one-fourth of trail traffic, with walkers and joggers comprising the majority.³

³ National Bicycle and Pedestrian Documentation Project, *Trends in Walking and Biking* (newsletter), October 2006.

Study purpose and scope

The purpose of this study is to produce a sketch plan for a network of trails and connecting bikeways, to serve as the basis for the development, with public input, of a trails plan for Gloucester County.

Developed in consideration of trip attractions, potentially feasible rights-of-way, natural features and roadway conditions, the sketch plan offers a conceptual network of four generalized trail corridors to be carried forward into public discussion and feasibility studies. For each corridor, an interim bike route using existing roadways and trails is recommended for immediate marking; and alternative off-road trail alignments are identified and described. Implementation costs are estimated at the programming level for both interim bike routes and long-term (permanent) trails.

Implementation actions are prioritized for each trail. While educated opinions are offered regarding the feasibility of certain trail alignments, a complete study of feasibility is beyond the scope of the project.

Inventory of Plans & Conditions

The trail network sketch plan is based on the linking of existing and proposed trails with potential trail alignments and bicycle-friendly roads. Therefore an inventory of existing conditions and plans was conducted, which included existing and planned bikeways and trails and potential trail alignments including greenways, highway and utility rights-of-way, and abandoned railroad rights-of-way. Bicycle-friendly state and county highways were identified through an evaluation of the entire county road network using the Bicycle Level of Service model.

Since bicyclists may be expected to use county roads to reach the trails, a general improvement in the bicycle-friendliness of county roads would increase trail use and decrease vehicle emissions from automobile trips to trailheads as well as to other destinations. An estimate of where the demand for bicycle trips is located would aid in prioritizing roads for bike lanes and shoulders. The results from three different methods of estimating bicycle demand are presented.

In addition, an inventory of destinations likely to attract trail users, including business districts, historic sites, parks, and recreation facilities, was conducted. These destinations are enumerated in the narratives for each proposed trail presented in Section 3.

The inventory was compiled from the following sources:

- New Jersey Statewide Bicycle and Pedestrian Master Plan Phase 2;
- DVRPC's Destination 2030 Regional Long Range Plan;
- DVRPC's 1997 Abandoned Railroad Inventory and Policy Plan;

New Jersey is a state where people choose to walk and bicycle; residents and visitors are able to conveniently walk and bicycle with confidence and a sense of security in every community; and both activities are a routine part of the transportation and recreation systems and support active, healthy life styles.

-- New Jersey State Bicycle & Pedestrian Master Plan Phase 2

SECTION 2: INVENTORY OF PLANS AND CONDITIONS

- County and municipal plans as inventoried by the Cross County Connection Transportation Management Association and the New Jersey Conservation Foundation;
- The New Jersey DOT statewide crash database;
- DVRPC's digital land base and roadway network and attribute data;
- DVRPC 2005 aerial orthophotography;
- The Gloucester County and various municipal web sites; and
- The New Jersey Conservation Foundation's statewide Green Infrastructure Assessment (also called "Garden State Greenways").

Inventory of trail network development opportunities

Existing, planned and proposed trails and bikeways. The most recent bicycle and pedestrian mobility plan for the southern New Jersey portion of the Delaware Valley region was published in 1997 as part of the year 2020 long range plan.⁴ That document contained an inventory of existing and proposed facilities; and while it defined a 2020 proposed bicycle network, it stopped short of specifying criteria for the design of the roadways included in the network. An extensive set of policies for promoting bicycling and walking, however, was prescribed.

Brief policy updates were included in the year 2025 and 2030⁵ regional long-range plans. These new policies reflect changes in Federal policy, the creation and update of state plans, the development of design guidelines, and the advancement of the state of the art of bicycle and pedestrian planning. They call for every roadway construction, reconstruction, and resurfacing project to be seen as an opportunity to redesign the facility for improved bicycle and pedestrian travel; and reference specific design criteria and guidance to be used in the scoping and design of these projects.

In addition, the current plan proposes a regional trails network (Figure 1, right) following, in part, a regional green space network

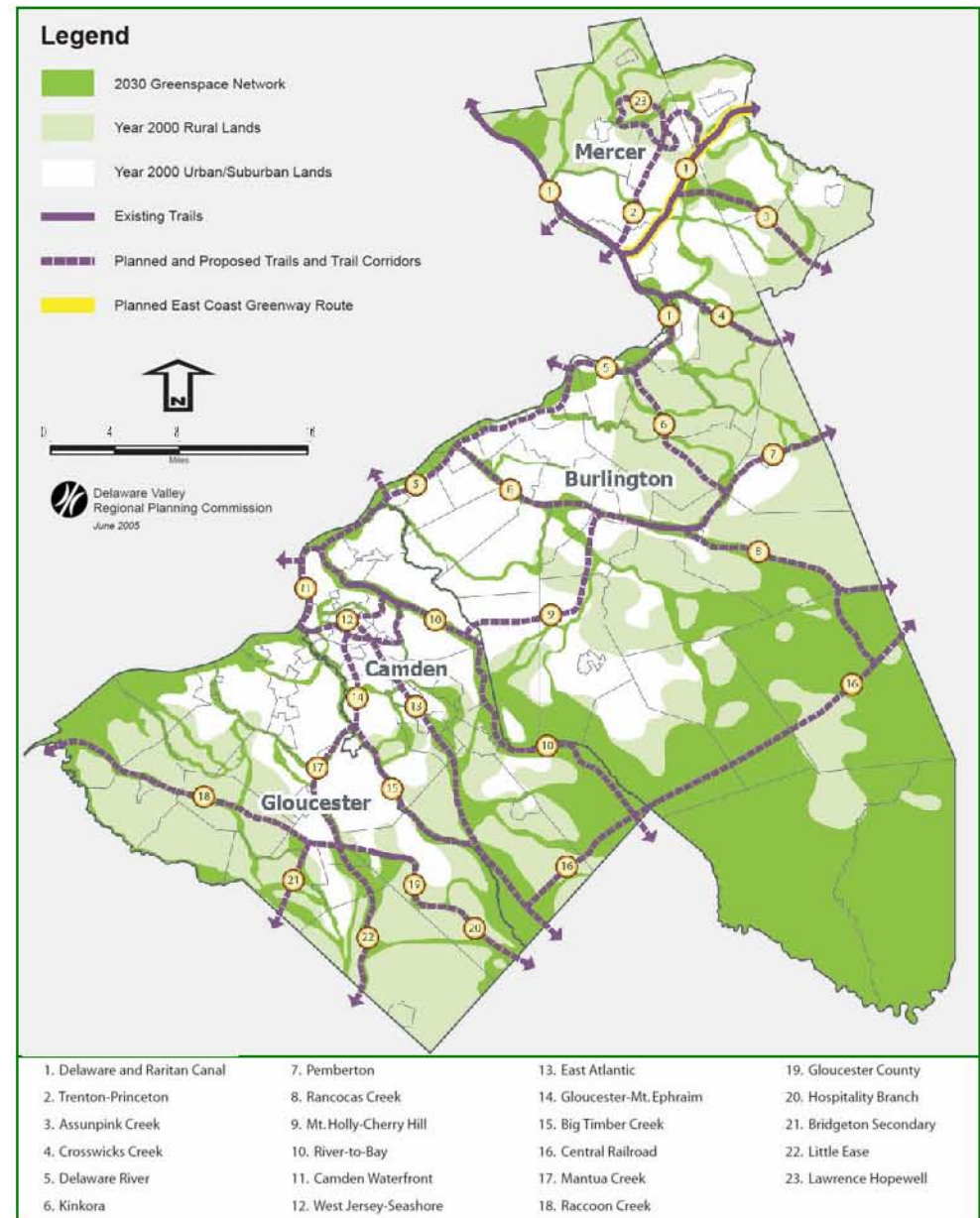


Figure 1: 2030 Regional Trails Network, Southern New Jersey Source: DVRPC, 2005

⁴ *Southern New Jersey Bicycle & Pedestrian Mobility Plan: An Element of the DVRPC Year 2020 Plan.* Philadelphia: Delaware Valley Regional Planning Commission, April 1997.

⁵ *Destination 2030: The Year 2030 Plan for the Delaware Valley.* Philadelphia: Delaware Valley Regional Planning Commission, 2006, pp. 43-46.

SECTION 2: INVENTORY OF PLANS AND CONDITIONS



Pipeline right-of-way adjacent to Turnpike, Deptford Source: DVRPC, 2006



Vineland Secondary Railroad right-of-way, Woodbury Heights
Source: DVRPC, 2006

and rural conservation lands. Proposed greenway trails in Gloucester County include:

- #15 Big Timber Creek;
- #17 Mantua Creek;
- #18 Raccoon Creek;
- #20 Hospitality Branch of Great Egg Harbor River;
- #21 Bridgeton Secondary (rail-trail); and
- #22 Little Ease Run.

An inventory of existing, planned and proposed bikeways was published by the Cross County Connection Transportation Management Association (CCCTMA) in June 2006.⁶ Project staff surveyed each of the county's 24 municipalities, as well as, county government in the fall of 2004. All of the governments responded. Where practical, existing and proposed trails identified in the inventory are incorporated in the sketch trail network plan.

Potential trail alignments. Appropriate features in DVRPC's digital land base were selected for further consideration as potential trail alignments, and mapped, including:

- Protected open space;
- Public and private recreational lands, including parks and golf courses;
- Wooded lands;
- Utility rights-of-way;
- Major highway rights of way, including the routes 42 and 55 expressways, I-295, and the New Jersey Turnpike; and
- Rail lines: active, inactive, and abandoned.

⁶ *Bicycle Facilities Inventory and Analysis: Gloucester County*. Marlton, NJ: Cross County Connection Transportation Management Association, June 2006.

DVRPC's 1997 *Abandoned Railroad Inventory & Policy Plan* was consulted to identify rail lines recommended for trail development.

Greenways. In 2004, the New Jersey Conservation Foundation presented the results of a sophisticated and extensive geospatial analysis of the state's land use; and a statewide, interconnected greenway system based on those results.⁷ All undeveloped lands were ranked along a complex set of criteria reflecting environmental values, connectivity, and feasibility. The resulting greenways network is presented as an online interactive map and in static pdfs of each county.⁸ A set of internet- and GIS-based planning tools is offered to help inform and coordinate the efforts of local municipalities and private citizens in preserving open space. The greenways map produced for Gloucester County as part of this effort was referenced to verify potential trail alignments.

Bicycle-friendly county and state highways. In order to quantify the quality of service provided to users of the transportation system, transportation engineers developed the *level of service* (LOS) concept. Primarily measures of user comfort, LOS indices have been developed for drivers, transit passengers, pedestrians, and, most recently, bicyclists.

Automobile LOS has principally been a measure of congestion, or more accurately, delay. Unlike motorists and their passengers, who travel surrounded by a reinforced steel box, many bicyclists feel

⁷ *New Jersey Green Infrastructure Assessment*. Far Hills, NJ: New Jersey Conservation Foundation, 2004.

⁸ <http://www.gardenstategreenways.org/county.htm>



Chestnut Branch greenway at Hollywood Dell, Pitman Source: DVRPC, 2006



Trail in freeway right-of-way: Pottstown Expressway (US 422) & Perkiomen Trail, Montgomery Co., PA Source: John Boyle, 2007

SECTION 2: INVENTORY OF PLANS AND CONDITIONS

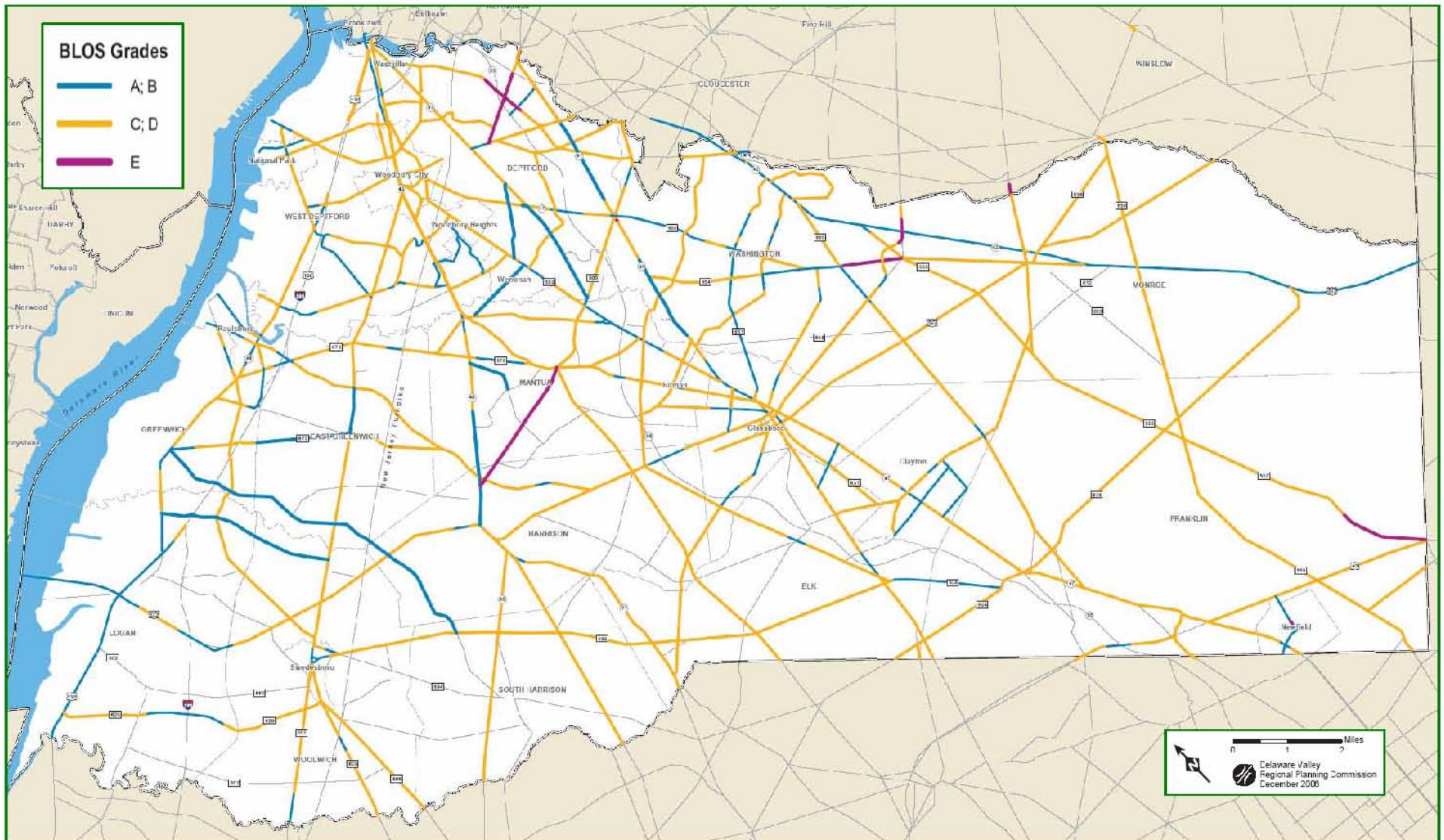


Figure 2: Bicycle Level of Service on county roads Source: DVRPC, 2006

vulnerable to injury in the event of a collision with a motor vehicle. This feeling of vulnerability intensifies with respect to traffic that the bicyclist cannot see and react to; specifically overtaking traffic. Therefore, one may say that bicyclist comfort is related to factors perceived by the bicyclist as affecting motorist opportunities to safely overtake the bicyclist. These factors include traffic volume, speed, lane configuration, curb lane width, presence and width of shoulder, and presence of a bike lane.

Another significant, although secondary, factor is pavement condition. Potholes, debris, and other problems associated with the riding surface may be the greatest cause of cyclist injuries.

The Bicycle Level of Service (BLOS) model, based on the real-time perceptions of bicyclists representing a cross-section of skill levels who were asked to rate their comfort level riding in a diverse sample of urban roadway conditions, has been developed.⁹ The model predicts how a typical bicyclist would rate a roadway based on a formula using objective measures of roadway geometry and operations typically kept by planning agencies including average annual daily traffic, roadway width, number of lanes, presence and width of shoulder, peak-to-daily traffic (K-factor) percentage of heavy vehicles, and speed limit.

A commercially available programmed spreadsheet was used to calculate BLOS on the state and county highways of the Congestion Management System (CMS) network. The model output is presented in Figure 2, opposite. The majority of Gloucester County's road mileage



Source: DVRPC, 2001

⁹ Landis, Bruce W. "Real Time Human Perceptions: Toward a Bicycle Level of Service." *Transportation Research Record 1578*, Transportation Research Board, Washington, DC, 1997.

SECTION 2: INVENTORY OF PLANS AND CONDITIONS

has a BLOS of C or D; however, a significant portion of the road network received an A or B, mostly due to a combination of low traffic volumes and the presence of a shoulder. Roads having a BLOS “E” include Almonesson and Clements Bridge roads in the vicinity of Deptford Mall; Hurfville and Berlin roads near Cross Keys; and Breakneck Road between Barnsboro and Mullica Hill.

Measures to improve BLOS should not be justified on the basis of improving safety for bicyclists. The safety effects of such improvements have never been systematically measured or quantified. Furthermore, it is unreasonable to expect these actions to be effective countermeasures to bicycle crashes: roughly three quarters of fatal car-bike crashes are caused by cyclist error.¹⁰ Evidence suggests that up to half of all crashes involving bicycles occur off of the arterial network, on collectors and local (residential access) streets, and primarily involve bicyclists aged 5 to 15 years.¹¹

Years of research on the effects of roadway design on motor vehicle crashes has made motor vehicle travel safer. In comparison, little research has been conducted on the effect of roadway configuration on bicyclist crash rates. Results of a recent study conducted in Florida indicate that the presence of shoulder stripe or bike lane stripe, with sufficient operating space to the right of the stripe for bicycles, increases the comfort level for both motorist and bicyclist in overtaking situations, while simultaneously decreasing the shy distance between

¹⁰*Traffic Safety Facts 1994: Pedalcyclists.* National Highway Traffic Safety Administration; Garder, Per. “Bicycle Accidents in Maine: An Analysis.” *Transportation Research Record* 1438.

¹¹Environmental Working Group, from Federal Highway Administration data.

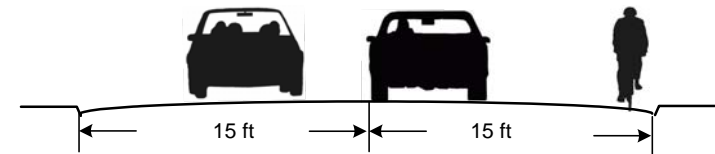
vehicles, reducing motorist incursions on the centerline, and encouraging the cyclist to travel further from the curb, thus increasing the bicyclist's visual presence on the roadway (See figure on right) .¹² With the passage of the Transportation Equity Act for the 21st Century (TEA-21), one may expect continued advances in bicycle transportation engineering knowledge.

In general, all rural highways should have a minimum four foot shoulder; all suburban arterials should be marked with five foot wide (minimum) bike lanes. On high-volume urban streets where limited space prohibits bike lanes, posted speeds should be 25 m.p.h. or less. Roadways should be evaluated for bike lane feasibility and, if feasible, redesigned and marked coincident with scheduled resurfacing or reconstruction.

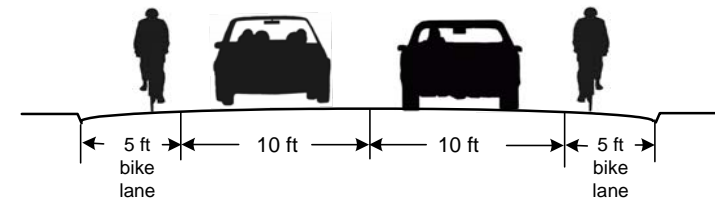
Improvements to roadway BLOS can be expected to increase bicycle travel in Gloucester County. However, the most significant opportunity to improve the safety of bicyclists and encourage bicycle use lies in improving the skills of bicyclists, making motorists aware of the presence of bicycles, and re-educating motorists on how to safely and properly interact with bicyclists on the road. In addition, as bicyclists become more skilled and confident, they will become more comfortable in a wider range of bicycling environments. It is imperative that motorist and bicyclist alike be educated as to the proper use of the improved roadways. Therefore, it is strongly recommended that the program of roadway improvements be implemented as a piece with a program of bicyclist and motorist education.

¹²Harkey, David L., P.E., et. al. *Evaluation of Shared-Use Facilities for Bicycles and Motor Vehicles*. Chapel Hill, NC: University of North Carolina Highway Safety Research Center, March 1996.

EXISTING:



PROPOSED:



Roads can be retrofitted for bike lanes often within the existing cartway. Bike lanes encourage bicyclists to operate in a safer position further from the curb while reducing motorist encroachment on the centerline, increasing comfort for both motorists and bicyclists.

Source: DVRPC, 2007

SECTION 2: INVENTORY OF PLANS AND CONDITIONS

Table 1: Bicyclist-involved crashes, Gloucester County, 1997-2001, by municipality

Municipality	Incidents
Deptford	24
Washington	24
Woodbury	18
Monroe	17
Pitman	13
Glassboro	11
Westville	9
Mantua	8
Franklin	7
Greenwich	7
West Deptford	7
Clayton	5
Paulsboro	4
National Park	3
Woolwich	3
Woodbury Heights	2
East Greenwich	1
Logan	1
Swedesboro	1

Source: NJDOT, 2004

Location of demand for trails and bikeways

Trip attractions. Destinations which could be expected to attract recreational bicyclists include parks, natural areas, pedestrian-oriented business districts, and historic sites. The locations of these leisure trip attractors were derived from the DVRPC land base and include regional, county, and local centers as defined in the regional long-range plan; printed and online maps, the County's web site, and municipal web sites. The greatest concentration of attractions lies along the National Park-Woodbury-Glassboro corridor.

There is currently no robust, empirically-derived demand model for bicycling; but that hasn't stopped many planners from attempting to devise one. Two such models intended as aids in prioritizing facilities for improvement or construction, are briefly described here.

Crash history as an indicator of existing travel. Bicycle counts have never been taken in Gloucester County, and were beyond the scope of this study. In lieu of bicycle counts, the geographic pattern of crashes between bicyclists and motor vehicles over time is the only data available upon which to infer where bicycling is most frequent. The New Jersey Department of Transportation maintains a database of reportable crashes coded from police reports submitted from local police departments. This database was queried for all crashes involving bicyclists in Gloucester County for the years 1997 through 2001. These data should not be interpreted as indicating dangerous locations for bicycling; risk can only be calculated relative to how much bicycling is occurring at a given location (exposure), which is unknown.

A total of 165 such crashes were recorded. The numbers of such crashes by municipality is presented in Table 1, preceding page; by route number, in Table 2, right.

The top four municipalities for incidents, which include Deptford, Washington, Woodbury, and Monroe, accounted for half of all incidents. These are the most populous of the county’s municipalities, are contiguous to each other, and lie along the County’s eastern border.

Only about 65 percent of crashes were identified with a particular route. Of the 37 state and county routes where incidents were recorded, the top three routes, State Highways 45 (Gateway Boulevard, Broad Street and Mantua Avenue) and 47 (Delsea Drive), and County Route 553, (which together comprise the county’s Woodbury-Glassboro “central corridor”) accounted for about one third of all crashes. Only nine routes, all listed in Table 2, reported more than two crashes.

Commuting. A study completed by Cross County Connection Transportation Management Association has prioritized proposed bikeways serving school and commuting trips. The CCCTMA report prioritized all planned and proposed facilities for funding using a point system based on census tract employment density and proximity to schools. Significantly, the CCCTMA report concluded that the highest priorities lie in the “Eastern Corridor” stretching from Westville through Monroe Township, coinciding with that part of the county where the most bicycle crashes occurred. Other corridors identified in the report as having significant commute potential are the Central Corridor, from Woodbury south to Elk Township and west to South Harrison Township; and the Western Corridor, extending from National Park to Logan and Woolwich townships. The prioritization of commuting

Table 2: Bicyclist-involved crashes, Gloucester County, 1997-2001, by route

Route	Name	Crashes
47	Delsea Dr	15
45	Gateway Blvd Broad St (Woodbury) Mantua Ave	13
553	Glassboro-Woodbury Rd Evergreen Ave Broadway	8
322	Various	7
534	Delaware St Cooper St Good Intent Rd	7
42	Black Horse Pike	5
44	Crown Point Rd Broad St (Paulsboro)	5
551	Kings Hwy	5
654	Hurffville-Cross Keys Rd	4

Source: NJDOT, 2004

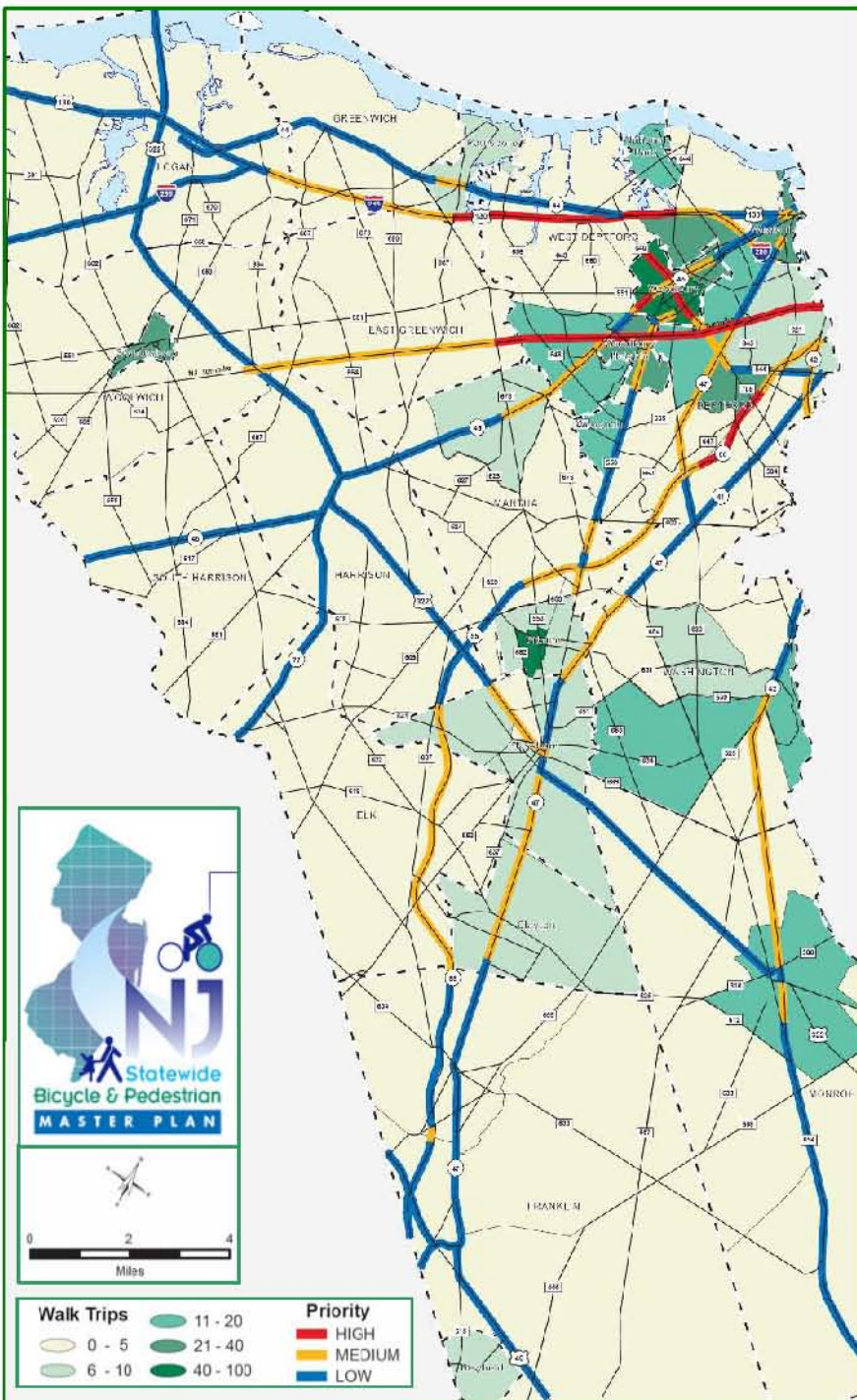


Figure 3: Prioritization of state highway network for pedestrian crossing improvements
 Source: NJDOT, 2004

corridors identified in the CCCTMA report appears to be supported by the crash data as an indication of where bicycle travel is currently concentrated.

Matching supply with demand. New Jersey's first statewide bicycle and pedestrian master plan, released in 1995, saw a major update in 2004. While Phase 1 focused on policies designed to achieve a vision for bicycling and walking, Phase 2 concentrates on facilities. This focus is the result of heightened interest in developing bicycle and pedestrian accommodations to the extent that funding requests for such projects far exceed available funds. Therefore, in fulfilling its primary goal of providing clear guidance on the most efficient and effective use of federal, state and local resources, Phase 2 prioritizes segments of the state highway system for bicycle and pedestrian treatments based on a model which attempts to match supply with demand.

In the NJDOT model, bicycle demand is principally a function of demographics and mode split, where a younger population, college students, a high transit mode split and numbers of current bicycle commuters contribute to demand. Pedestrian demand is derived from street network, population and employment density, and relative balance of land uses.

Suitability, or level of service, is measured by the Bicycle Compatibility Index (BCI), a competitor to the BLOS model developed by the Federal Highway Administration. Like BLOS, BCI is determined by roadway characteristics such as traffic speed and volume, presence of shoulders, or shoulder lane width. Pedestrian Suitability, defined as the ability of a person on foot to cross the roadway, factors in the speed and volume of traffic, the presence of a median refuge, and spacing of signalized crossings to determine overall delay from wait-

ing for a safe gap in traffic in which to cross. The NJDOT model outputs are illustrated in Figures 3 (preceding page) and 4 (right).¹³ Road segments were categorized as “high priority” for improvement where the suitability of the roadway is low and the demand, computed by census tract, is high.

Roads indicated by the NJDOT supply/demand model as high priority for bikeway improvements include CR 553/NJ 47 (Woodbury Avenue/Delsea Drive) from NJ 55 to US 322 through the downtowns of Pitman and Glassboro; and County Roads 706 and 544, Cooper Street and Clements Bridge Road, linking Thorofare and the Deptford Mall through downtown Woodbury. Roads having the highest priority for pedestrian crossing improvements are concentrated in Deptford, West Deptford, and Woodbury.

The NJDOT bicycle model also indicates portions the New Jersey Turnpike, Atlantic City Expressway, and the Route 42 Freeway are identified as high priority for bikeway improvements. Although bicycle travel is prohibited on those roadways, opportunities to create multi-use trails within the highway right-of-way may be present. The Route 55 freeway is open to bicycle travel on the highway shoulder.

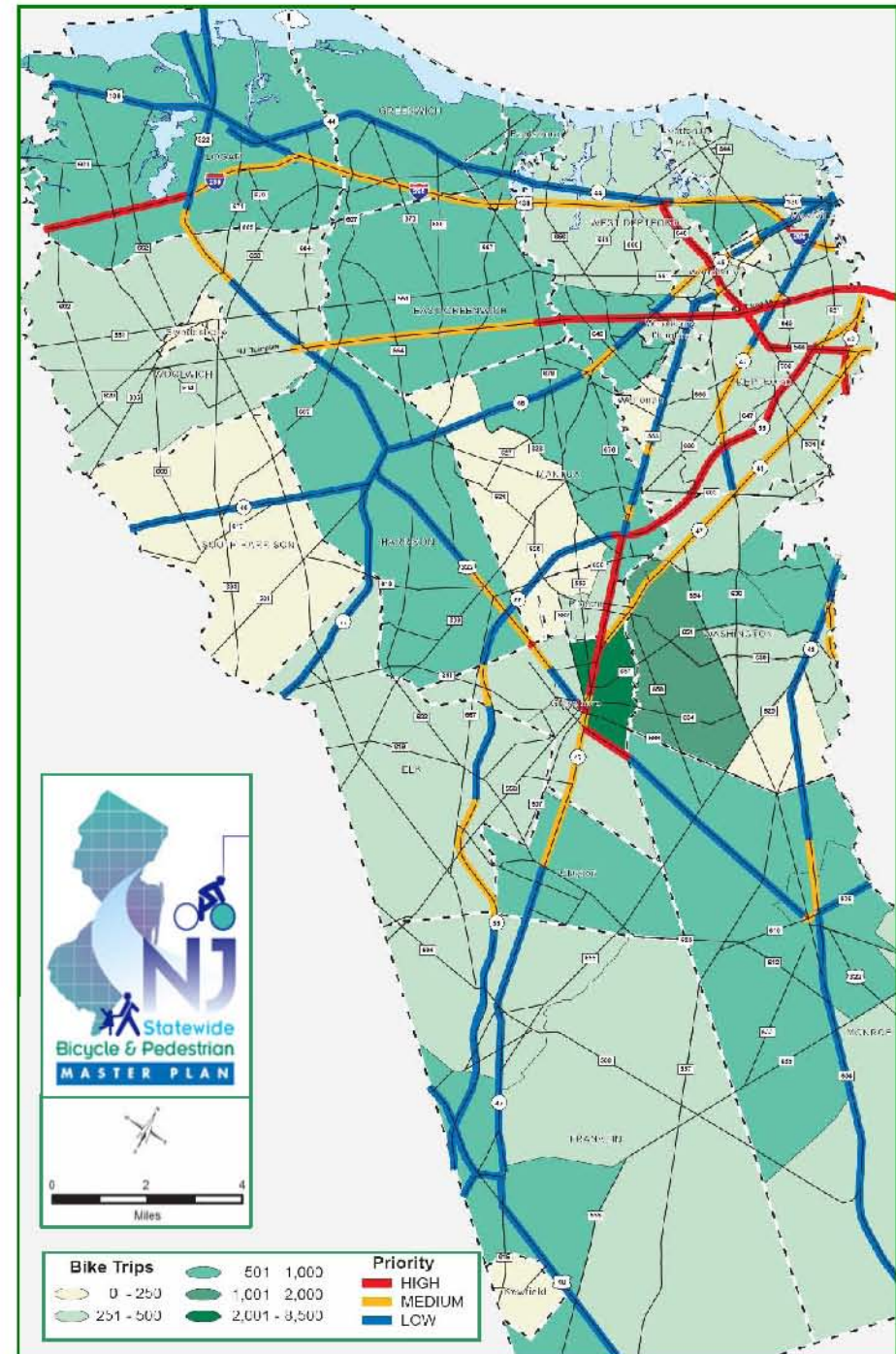


Figure 4: Prioritization of state highway network for bicycling improvements
Source: NJDOT, 2004

¹³ Methodology used to classify priority segments may be found in *NJ Statewide Bicycle/Pedestrian Master Plan – Phase 2, Final Report*, NJDOT and The RBA Group, June 2004, pp. 10-12.



Source: DVRPC, 2006

Proposed Trail Network

In the following pages a conceptual plan for a countywide trails network is presented. Following existing and proposed trails, stream corridors, public and private open space (including golf courses), and abandoned and active railroads, the proposed network connects the county’s historic towns with major parks and natural features along four principal corridors which generally align with the following features: the Delaware River, the Vineland Secondary Railroad, US 322, and Little Ease Run. These trails are tentatively named the Delaware Estuary Trail, the Towns & Trains Trail, the Gloucester County Trail, and the Little Ease Trail, respectively. With the sole exception of the Delaware Estuary Trail, potential alignments for multi-use trail facilities have been identified. These alignments are presented in Figure 5, Future multi-use trails network – alignment opportunities, on the following page.

Development of these trails will take many years to complete. In the interim marked bike routes using existing roads and trails are recommended based on their Bicycle Level of Service, directness, service to likely trip generators, and scenic values. The identified alignments of these routes are presented in Figure 6, Interim bike routes, on page 26. Identification of each of these routes through unique signage will, in addition to providing navigation, help to “brand” each route and the trail network as a whole in the public mind, developing anticipation for the completion of the permanent trails.

Detailed descriptions of each of the trail corridors are presented in turn. For each trail corridor, both the interim on-road and permanent off-road alignment alternatives are described; a short list of “next steps” is offered, and programming-level cost estimates are presented.

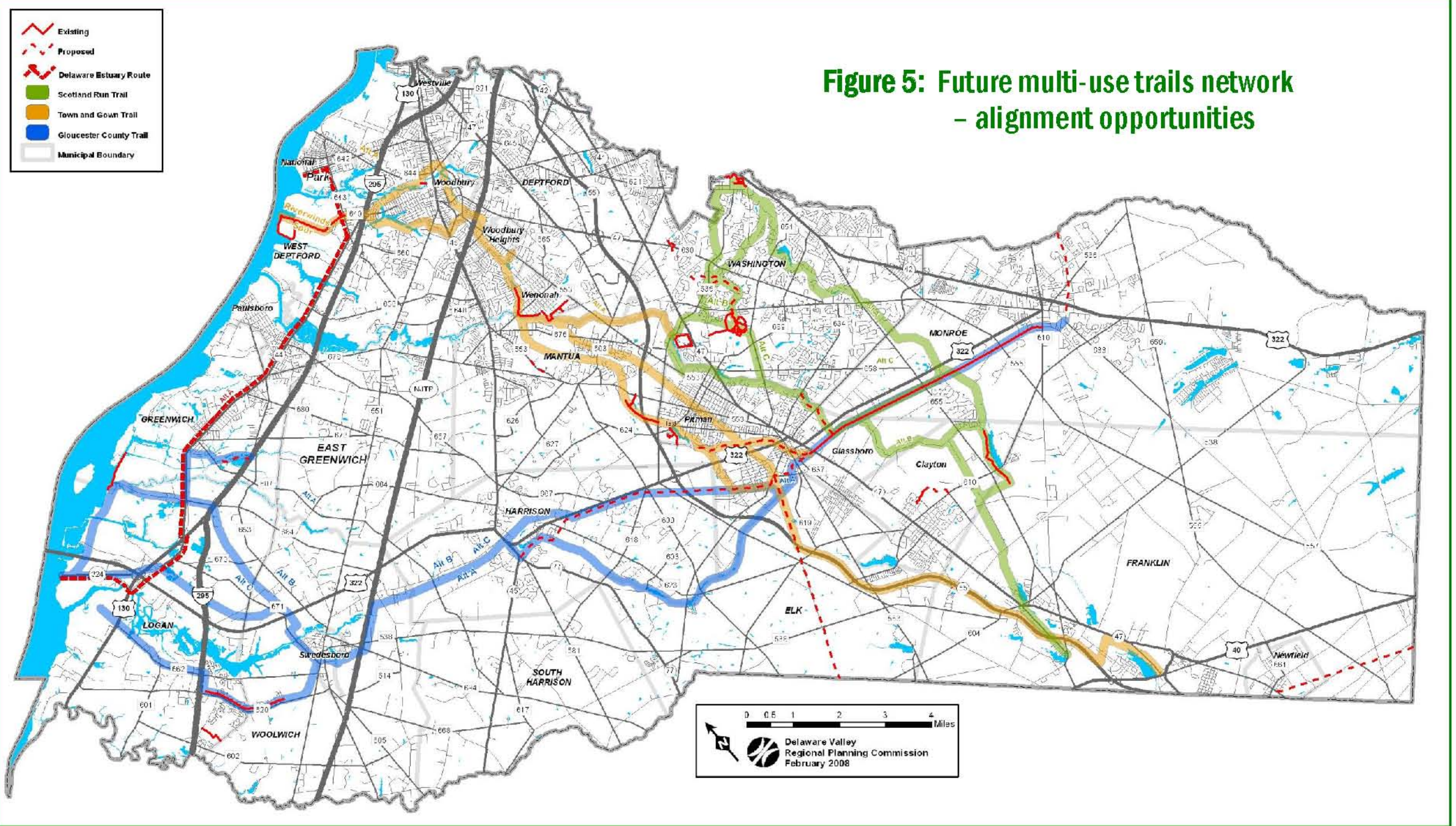
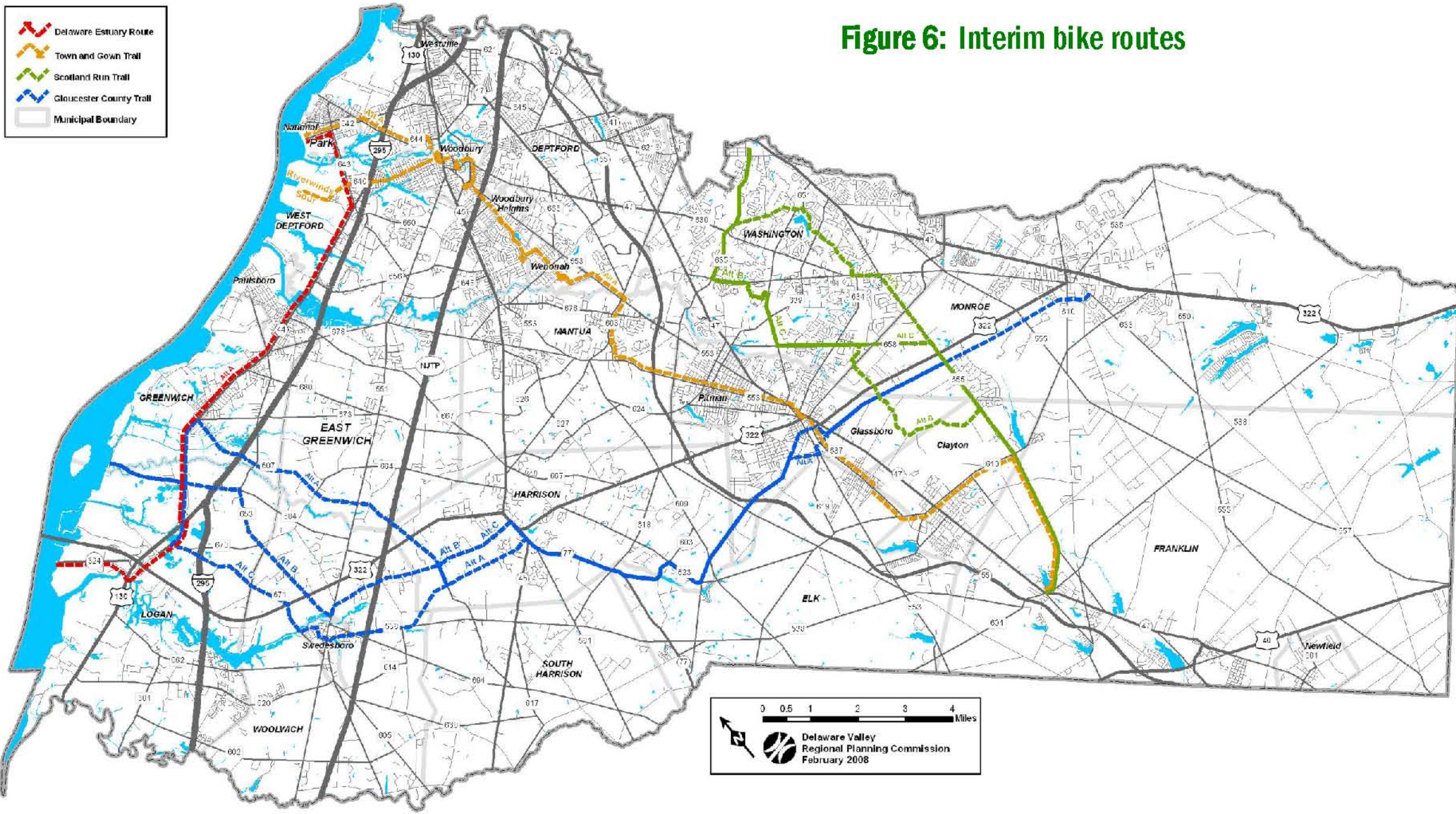


Figure 5: Future multi-use trails network – alignment opportunities

Figure 6: Interim bike routes

- Delaware Estuary Route
- Town and Gown Trail
- Scotland Run Trail
- Gloucester County Trail
- Municipal Boundary



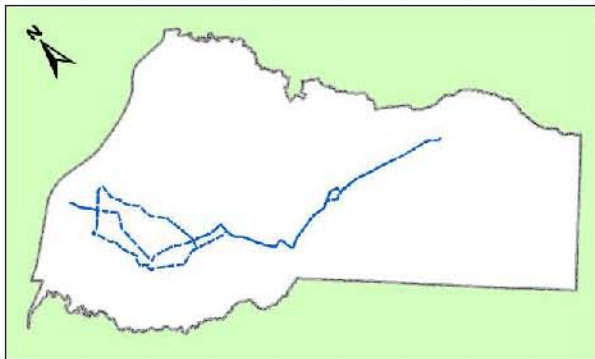


Monroe Township Bike Path, Williamstown [Source: DVRPC, 2004](#)

Gloucester County Trail

The Gloucester County Trail is destined to become the county's premier multi-use trail. The trail will extend nearly 28 miles on an independent alignment running east to west along abandoned rail beds, stream banks, and road rights-of-way from Williamstown to either Floodgate Park on the Delaware River in Greenwich Township or the proposed Delaware River Equestrian, Agricultural and Marine (DREAM) County Park at the mouth of Raccoon Creek in Logan Township, passing through the historic towns of Glassboro, Mullica Hill, and Swedesboro along the way.

The easternmost quarter of the alignment, from Williamstown to Glassboro, is either completed or nearly so, with a 10-foot wide asphalt surface along a seven-mile stretch of abandoned rail right-of-way. An interim marked route follows some of the county's most scenic back roads. The trail and interim route will allow users to experience the diversity of the County's traditional landscapes: farmland, forest, estuary, and small towns; while passing near the county's fastest-growing areas.



Interim route alignments Source: DVRPC, 2008



Victorian architecture, Swedesboro Source: DVRPC, 2006

SECTION 3: PROPOSED TRAIL NETWORK



Kings Highway, Swedesboro Source: DVRPC, 2006



The Old Swedes Inn Source: DVRPC, 2006

Principal destinations

- ❖ Williamstown business district
- ❖ Glassboro business district
- ❖ Mullica Hill village
- ❖ Swedesboro village
- ❖ Church Street Recreational Fields, Williamstown
- ❖ Rowan State University
- ❖ Glassboro Wildlife Management Area
- ❖ Active recreation sites in Williamstown and Glassboro
- ❖ Floodgate Park
- ❖ Williamstown High School
- ❖ Pureland Industrial Park

Historic attractions

Swedesboro

- ❖ **The Governor Stratton House**, c. 1794. *East side of Kings Highway, just north of Raccoon Creek.* Here, Charles Creighton Stratton, first governor elected under the 1844 State Constitution, spent his entire life. Private.
- ❖ **Hatton House**, *935 Kings Highway.* Built in the mid-18th century by one of the most reviled men in South Jersey --John Hatton, known as His Majesty's "Collector of Customs for the Crown." Under this title Hatton tried to enforce the hated Stamp Act, collected revenues and attempted to stop the illicit trade and smuggling then rampant throughout South Jersey. Private.
- ❖ **Old Ford Hotel**, *306 Kings Highway.* Its earliest recorded use was "dry goods store" in 1800; licensed as a tavern in 1806. Private.
- ❖ **The Old Swedes Inn**, *301 Kings Highway.* Originally licensed as a stagecoach-stop tavern in the mid-1700's, is of 'peg' construction with no nails supporting its massive wooden beams.
- ❖ **Trinity Episcopal Church (Old Swedes)**, c. 1784, *Kings Highway (County Road 551) south of the Raccoon Creek.* Oldest deeded church property in the County and the first Lutheran congregation in New Jersey. A log church was built on the site in 1703. The congregation became Episcopalian in 1786 after the Swedish government stopped sending ministers to America.
- ❖ **The Pisant House**, c. 1725, *Northeast side of Raccoon Creek about one block from the bridge.* Private.

Mullica Hill

- ❖ **Ellis House**, *44 South Main Street*. Private.
- ❖ **Mullica Hill Friends Meeting House**, c. 1806. *Main Street*.
- ❖ **Old Town Hall**, c. 1871. *South Main Street*. Built by a private stock company, the building is a noteworthy example of mid-Victorian architecture.
- ❖ **Spicer House**, c. early eighteenth century. *76 South Main Street*.
- ❖ **William Mullica House**, *Main Street*. Named for youngest son of Eric Mullica, founder of Mullica Hill in the late 1600's. Private.

Elsewhere

- ❖ **Adams Meeting House**, c. 1793. *Northeast corner of Oak Grove Road and Stone Meeting House Road, halfway between Bridgeport and Swedesboro*. Oldest Methodist Church building in Gloucester County.
- ❖ **Grand Sprute Plantation**, c. 1756, and **Mortonson-Schorn Log Cabin**. *On a side road off Rt. 322, 2 miles west of the intersection of U.S. 322 and County Road 551, Woolwich Township*. Grand Sprute Plantation is an old brick farm house used as a trading post by both Native Americans and European settlers. One of the oldest original log cabins of early Swedish-Finnish architecture in the US was built by Morton Mortonson, the grandfather of John Morton, signer of the Declaration of Independence. Prior to and during the Civil War, the cabin was used as a station for the Underground Railroad. Private.
- ❖ **Iredell House No. 2**, c. 1793. *East of the bridge over Raccoon Creek, Ewan*. Built by Thomas for his second wife, Rebecca, its distinctive chimney design is claimed to be one of only three found in the US. The initials T.A.R. on the front peak facing the road are believed to stand for the names of the three Iredell children -- Thomas, Ann, and Rebecca. Private.



Coffeehouse, live music, Mullica Hill [Source: DVRPC, 2006](#)



Iredell House # 2, Ewan [Source: DVRPC, 2006](#)

SECTION 3: PROPOSED TRAIL NETWORK



Levee trail, Floodgate Park, Greenwich Twp. Source: DVRPC, 2005



Monroe Township Bike Path Source: DVRPC, 2001

Public libraries

- ❖ Glassboro: *2 Center Ave.*
- ❖ Monroe Township: *320 S. Main, Williamstown.*
- ❖ Swedesboro: *442 Kings Hwy.*

Segment 1: Williamstown – Glassboro

An asphalt trail known as the Monroe Township Bike Path has been completed 6 ¼ miles from Blue Bell Road (County Route 633) to Delsea Drive (NJ 47) in Glassboro. The entire segment utilizes the abandoned Williamstown Branch of the former Pennsylvania – Reading Seashore Line, passing through the Glassboro Fish and Wildlife Management Area. The existing trail parallels US Route 322 approximately ¼ mile to the south, passing behind houses on Cornus Court off of Fries Mill Road. This route will serve as the permanent alignment.

Segment 2: Glassboro – Mullica Hill

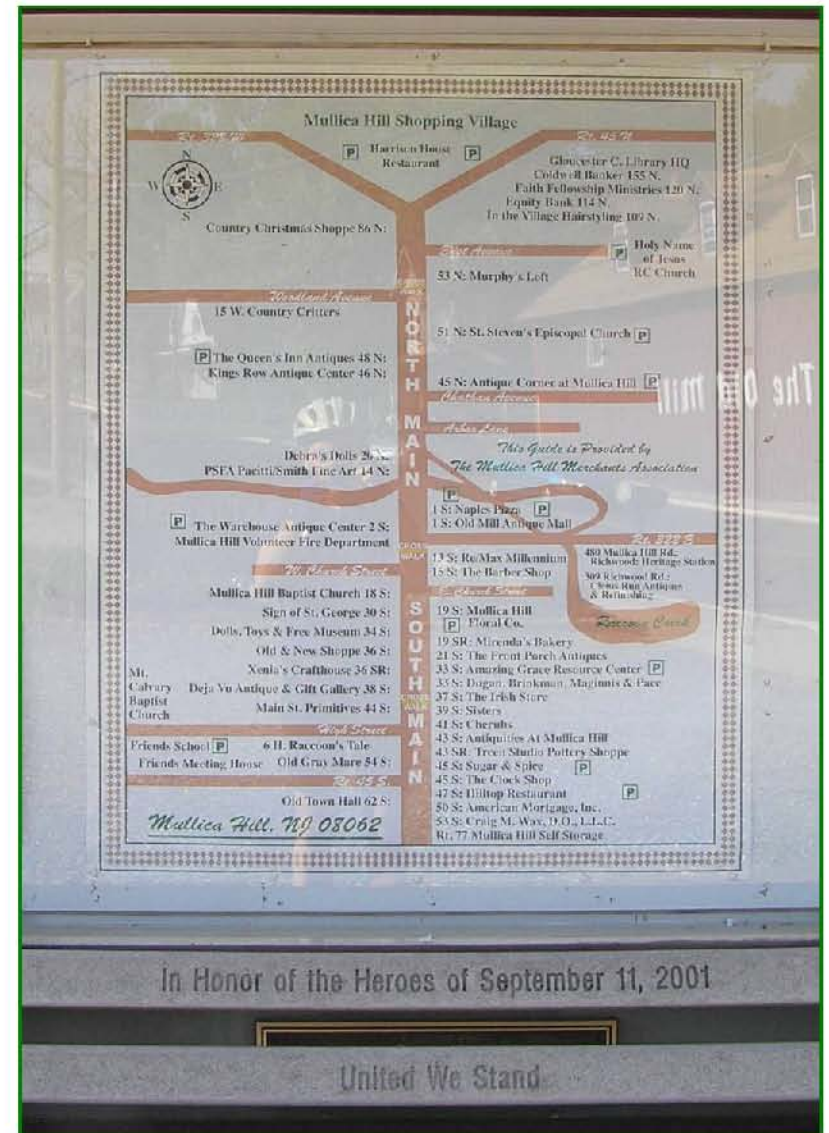
Short-term alignment and alternatives

A low-volume roadway route with average or superior bicycle level of service has been identified. The route passes through picturesque farmland and the historic village of Ewan, where a general store may be found.

Long-term alignment and alternatives

Two potential off-road alignments exist. The Williamstown Branch line right-of-way appears to have reverted to private uses or non-trail public recreation; however, the former rail alignment appears to have remained clear of manmade obstructions from Delsea Drive (NJ 47) to NJ 55, passing through public ballfields and the Owens Illinois plant property on Sewell Street. The former alignment is still identifiable from the east side of Richwood-Aura Road (County Road 667) along farm tractor lanes and residential rear-lot property lines to Shady Lane in Harrison Township, after which it becomes obscured by a peach orchard and residential properties. An unobstructed power line right-of-way commences at the rear of a residential property fronting US 322 just to the east of Sherwin Road, and continues to Bridgeton Pike (NJ 45) north of the US 322 junction in Mullica Hill, intersecting with the proposed Raccoon Creek greenway.

The second alignment follows the North Branch of the Raccoon Creek for the entire distance. This stream corridor has been proposed as a greenway in the Harrison Township Open Space and Recreation Plan.



Visitor information, Mullica Hill Source: DVRPC, 2006

SECTION 3: PROPOSED TRAIL NETWORK

Segment 3: Mullica Hill – Swedesboro

Short-term alignment and alternatives

A potential on-road alignment has been identified, described from east to west, following Woodland Avenue, Mullica Hill Creek Road, Tomlin Station Road, Mullica Hill-Swedesboro Road and Swedesboro-Franklinville Road.

Lined with large, recently-built luxury homes and intersected by streets providing access to such homes, this route flanks the proposed greenway closely, first to the north and then to the south. The area served by these roads is undergoing rapid residential development.

Long-term alignment and alternatives

The Raccoon Creek stream corridor connects Mullica Hill with Swedesboro. This corridor has been identified as worthy of preservation as a greenway by both DVRPC, on behalf of the townships of Harrison and Woolwich, and the New Jersey Conservation Foundation, as part of a potential statewide network of greenways. A steep bluff defines the corridor's southern edge. A superficial assessment indicates that the most suitable trail alignment would be along the top of the stream's lower north bluff.

From the New Jersey Turnpike to its confluence with the Delaware River, Raccoon Creek is a tidal estuary. Constrained by wetlands adjoining residential property, opportunity for trail development along the stream corridor vanishes.

Segment 4: Swedesboro – Delaware River

Short-term alignment and alternatives

Three suitable roadway alternatives traverse the scenic farmland and marshland between Swedesboro and two potential Delaware River destinations: Floodgate Park, or a proposed new County park to be situated at the mouth of Raccoon Creek. The three routes are:

1. High Hill Road (County Route 662) and US 130. High Hill Road is a proposed bike route in the Logan Township Open Space and Recreation Plan (2004).
2. Locke Avenue and Oak Grove Road (County Route 671) and Crown Point Road (NJ 44). CR 671 passes through a NJDEP Natural Heritage Priority Site (Grand Sprute Run) and a Farmland Preservation Area before connecting with the proposed NJ 44 bikeway. This route is the preferred alternative.
3. Swedesboro-Paulsboro Road (County Route 653), Repaupo Road (County Road 684) and Floodgate Road. The most direct route between Swedesboro and Floodgate Park. Eastbound, difficult left turn from Kings Highway (County Road 551) to Swedesboro-Paulsboro Road.

The trail could be formally extended at Floodgate Park north atop the levee for about one mile along the Delaware River and Aunt Debs Ditch, terminating at Sand Ditch.

Long-term alignment and alternatives

The land between Swedesboro and the river through Woolwich Township is constrained by preserved farmland and wetlands. The remaining land may be subject to rapid development in the coming years. This development may offer opportunities for trail right-of-way acquisition.



Picturesque view from Floodgate Road Source: DVRPC, 2006



Center Square Road sidepath, Woolwich Twp. Source: DVRPC, 2007

SECTION 3: PROPOSED TRAIL NETWORK

Table 3: Interim (short-term) route alignment, Gloucester County Trail

Road	Action	Miles
Monroe Twp Bike Path & Blue Bell Rd, Williamstown	BEGIN	
Monroe Twp Bike Path	WEST	3.5
Gloucester Co Trail	STRAIGHT	3.5
NJ 47 Delsea Dr	LEFT	0.1
Grove St	RIGHT	0.2
Williams Rd, Glassboro	RIGHT	0.38
High St	LEFT	0.41
Ellis St/Ellis Mill Rd	LEFT	4
Clems Run	RIGHT	0.84
Main St	LEFT	0.42
Ewan Rd	BEAR RIGHT	0.78
NJ 77 Bridgeton Pike	STRAIGHT	2.07
NJ 45 S Main St	STRAIGHT	0.75
Woodland Ave	LEFT	1.7
CR 607 Tomlin Station Rd	RIGHT	0.4
High St	RIGHT	1.1
CR 538 Franklinville Rd	RIGHT	1.2
CR 666 Franklin St/Lake Ave	STRAIGHT	0.6
CR 551 Kings Hwy	RIGHT	0.1
Railroad Ave	LEFT	0.1
Third St	RIGHT	0.1
Broad St	LEFT	0.3
CR 671 Locke Ave/Oak Grove Rd	RIGHT	3.44
NJ 44 Crown Point Rd	RIGHT	1.5
Flood Gate Road	LEFT	1.5
Delaware River	END	28.79

Source: DVRPC, 2007

One alignment alternative would use an existing three-quarter-mile developer-built sidepath along Center Square Road which could be extended nearly two miles in open right-of-way along Center Square Road and I-295 to High Hill Road.

Priorities

As an off-road, multi-use trail, one quarter of the distance of the proposed alignment is completed. Opportunities exist to bring the remainder off-road using part of a former rail right-of-way, a utility right-of-way, a riparian corridor, and developer dedications. Feasibility studies are required to determine precise alignment alternatives and costs.

Development is occurring rapidly between Mullica Hill and Swedesboro, and has begun to accelerate between Glassboro and Mullica Hill. Feasibility studies should be done soon, before trail development opportunities are lost to development.

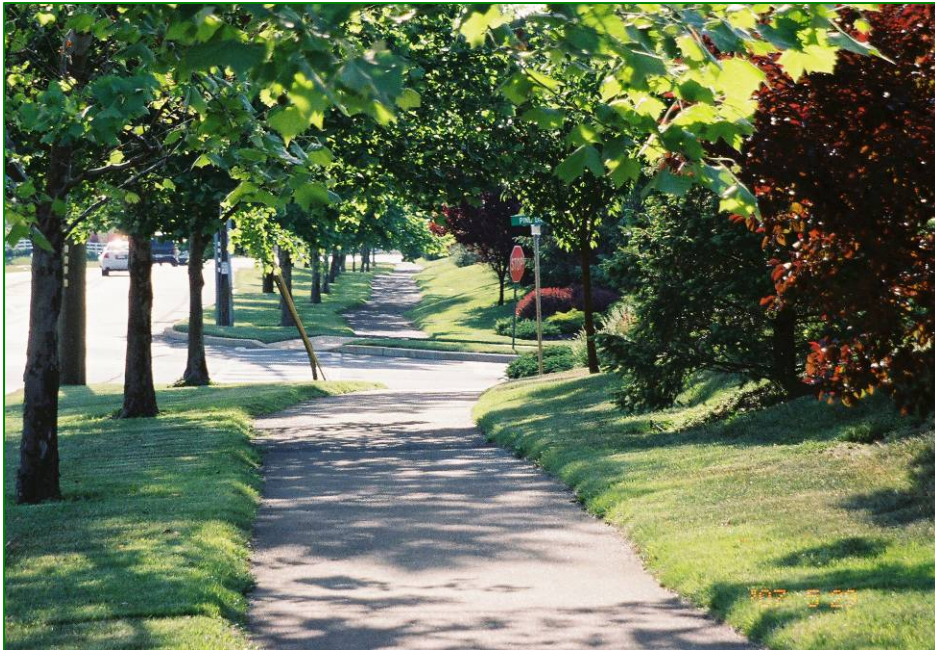
In the meantime, the proposed on-road route provides a pleasant and scenic experience for road cyclists. An attractive route marking system should be developed and installed. A distinctive logo for the trail signage will create a “brand” useful in developing support for an off-road trail.

Priorities for development of the Gloucester County Trail are, in order:

- 1. Develop route signage system, and sign interim route;**
- 2. Study trail feasibility of Mullica Hill to Swedesboro (Raccoon Creek Greenway) segment;**
- 3. Study trail feasibility of Glassboro to Mullica Hill segment; and**
- 4. Work with Woolwich and Logan townships to establish a trail alignment to be implemented as development occurs.**

Estimated costs

Design and construction costs to extend the multi-use trail from Glassboro to Swedesboro are on the order of \$6-8 million. Costs for signing the interim (short-term) route, including re-signing the Monroe Township trail, are estimated at \$90 to \$100 thousand.¹⁴



Center Square Road sidepath, Woolwich Twp. Source: DVRPC, 2007

¹⁴ Estimate derived from an on-line bicycle facilities cost estimation tool found at <http://www.bicyclinginfo.org/bikecost/index.cfm>. Multi-use trail costs calculated assuming that the costs would occur in 2010. Signage costs for the interim route assumed a construction year of 2008.



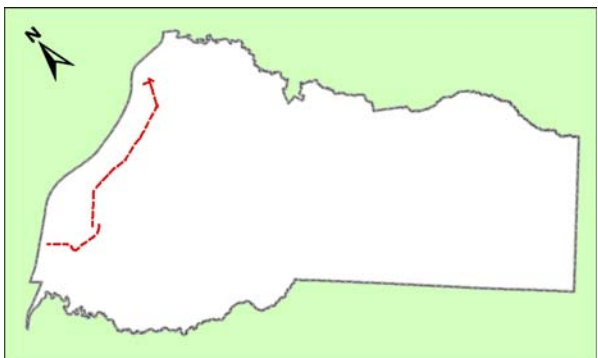
Watching a passing cruise ship, Red Bank National Historic Park [Source: DVRPC, 2006](#)

Delaware Estuary Route

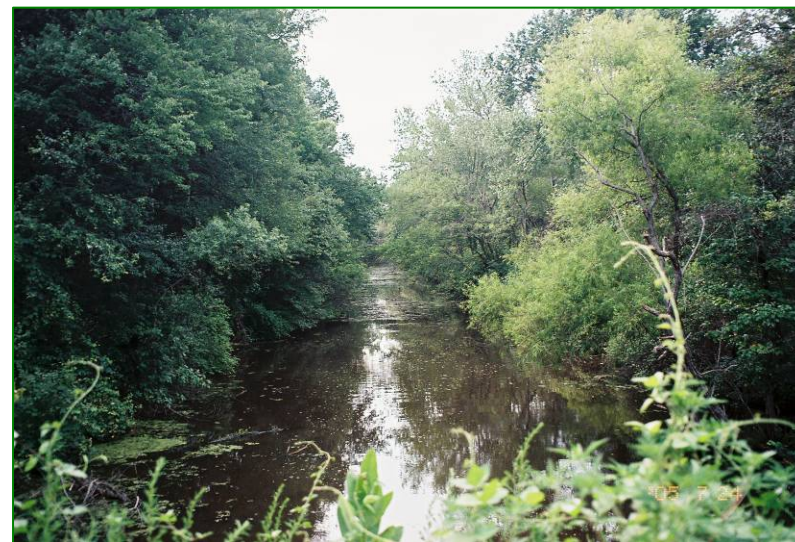
Save for a few special places, Gloucester County's Delaware River waterfront remains inaccessible to the public, guarded by heavy industry, private homes, and tidal wetlands. These features make a riverbank pathway infeasible. However, the river and its estuarine tributaries are the locus of much history and natural beauty, ideally explored by bicycle along relatively quiet streets and shouldered highways.

The Delaware Estuary Route will link the towns of National Park, Paulsboro, Gibbstown, and Bridgeport, the Red Bank Battlefield, and a proposed County park on the Raccoon Creek near its confluence with the Delaware, principally along NJ Route 44, a bicycle-friendly road with shoulders and relatively low traffic volumes.

Picturesque views of tidal wetlands are a special experience along this route. Riverfront sites near the trail include RiverWinds Recreation Center, via the new West Deptford trail, and Flood Gate Park via Flood Gate Road, a proposed part of the Gloucester County Trail.



Permanent route alignment Source: DVRPC, 2008



Scenic view of Repaupo Creek from NJ Route 44, Logan and Greenwich townships
Source: DVRPC, 2005

SECTION 3: PROPOSED TRAIL NETWORK



Red Bank Battlefield National Historic Site Source: DVRPC, 2006



Downtown Paulsboro Source: DVRPC, 2006

Principal destinations

- ❖ Downtown National Park
- ❖ Downtown Paulsboro
- ❖ Downtown Gibbstown
- ❖ Downtown Bridgeport

Historic attractions

Paulsboro

- ❖ **Fort Billings' Site** on Delaware River. A granite monument marks the location of Fort Billings, built during the Revolution to prevent the British fleet from communicating with Philadelphia. The land for this fort was the first land purchase of the U.S. government, deeded July 5, 1776.
- ❖ **The Gill House** (Private) ca. 1800. *West side of Broad Street.*
- ❖ **The Paul House** ca. 17th – 19th C. *212 East Broad Street.*
- ❖ **Nothnagle Log Cabin** ca. early 17th C. *Near intersection of Broad Street, Paulsboro and the Paulsboro-Swedestown Road, Greenwich Township.* Oldest log cabin in the U.S.

National Park

- ❖ **Red Bank Battlefield.** *On Delaware River.* The Pennsylvania Council of Safety (Revolutionary War) erected Fort Mercer here to guard the river approach to Philadelphia from the British. The Hessians under Count von Donop attacked in 1777, but were defeated.
- ❖ **James Whitall, Jr. House** ca. 1766. *Grove and Lakehurst Ave.* Private.
- ❖ **James and Ann Whitall House**, ca. 1748. *100 Hessian Avenue.* The builder's wife, Ann Whitall, was a sister of John Cooper, a member of the Continental Congress in 1776. The house was caught up in the attack on Fort Mercer at Red Bank in October, 1777. Tradition states that Whitall continued to spin yarn while the battle raged outside, and afterward nursed the injured Hessians. Private.

Public libraries

- ❖ **Gibbstown Municipal Department Public Library** *Swedesboro Rd., Gibbstown*
- ❖ **Gill Memorial Library** *Broad St., Paulsboro*
- ❖ **West Deptford Public Library, South Jersey Environmental Information Center** *Grove Ave. & Crown Point Rd., Thorofare*



James and Ann Whitall House [Source: DVRPC, 2006](#)

SECTION 3: PROPOSED TRAIL NETWORK



Grove Street (CR 643), National Park Source: DVRPC, 2006



NJ 44 just east of Paulsboro Source: DVRPC, 2006

Opportunities and constraints

The opportunity for a continuous multi-use trail along the bank of the Delaware River is all but precluded by existing land uses and environmental constraints. Sun, BP, and Mobil own and operate oil refineries and associated marine terminals fronting the river in Paulsboro; a DuPont chemical plant occupies the waterfront in Gibbstown. Private residential properties abut the waterfront in Paulsboro. The remaining undeveloped land is largely tidal wetlands. The Penn's Grove Secondary, an active freight line serving industrial customers along the corridor, has insufficient right-of-way for consideration of rail-with-trail. However, a detailed feasibility study may reveal an opportunity for a riverfront trail downstream (west) of Sand Ditch along levees in Greenwich and Logan townships.

For bicyclists, an acceptable on-road route is found using Grove Avenue and NJ Route 44 (known variously as Crown Point Road and Broad Street). Traffic volume ranges from moderate in the vicinity of Paulsboro, to light between Gibbstown and Bridgeport. Shoulders exist along most of the route's length, and sidewalks are found in the settled areas including Thorofare, Paulsboro, Gibbstown, and Bridgeport. The Bicycle Level of Service ranges from B to C. Bike lanes may be feasible along this route through re-striping the roadway.

Estimated costs

Re-striping the route for bike lanes is estimated to cost between \$50 and \$75 thousand. Route signage will cost between \$10 and \$15 thousand.

Table 4: Permanent alignment, Delaware River Route

Road	Action	Miles
Red Bank Battlefield Park	BEGIN	
Hessian Ave (CR 642)	EAST	0.50
S Grove Ave (CR 643)	RIGHT	1.60
Crown Point Rd/Broad St/Main St (NJ 44)	RIGHT	11.33
Island Rd	RIGHT	0.50
Old Ferry Rd	LEFT	1.50
Delaware River	END	15.43

Source: DVRPC, 2008



Old Ferry Road (abandoned), Logan Twp. Source: DVRPC, 2006



Source: DVRPC, 2006

Towns and Trains Trail

In the 19th Century, a railroad was built to haul produce and other raw materials from the south Jersey countryside to Camden and Philadelphia, sprouting a line of towns along its path -- Clayton, Glassboro, Pitman, Sewell, and Wenonah – while accelerating the growth of Woodbury, the county seat. The Towns and Trains Trail connects these walkable Victorian and Colonial settlements, which are still home to a large portion of the County’s population, with the Delaware River, the county’s only university, peach orchards, and lakes on the edge of the Pinelands wilderness. Users will find the route richly layered in history.

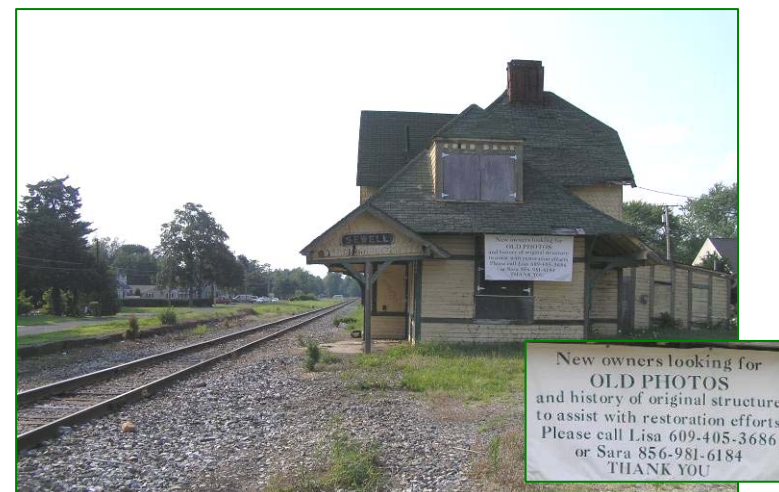
The eventual alignment of the multi-use trail will utilize the existing West Deptford Bike Path at RiverWinds, riparian open space and existing and proposed trails along the Woodbury, Mantua and Chestnut Branch creeks, or excess right of way along the Vineland Secondary railroad; the abandoned Bridgeton Secondary alignment, and the NJ Route 55 right-of-way. The trail will branch at Woodbury toward the river, terminating at West Deptford Community Center and at Red Bank Battlefield Park; while terminating in the south at Franklinville Lake or Malaga Lake.



Interim route alignments Source: DVRPC, 2008



Stewart Lake Park, Woodbury Source: DVRPC, 2006



Sewell Train Station, Vineland Secondary Railroad Source: DVRPC, 2006

SECTION 3: PROPOSED TRAIL NETWORK



West Deptford Community Center Source: DVRPC, 2004



Source: DVRPC, 2006

Principal destinations

- ❖ RiverWinds
- ❖ Downtown Woodbury
- ❖ Stewart Park
- ❖ Chestnut Branch Park
- ❖ Ceres Park
- ❖ Hollywood Dell
- ❖ Betty Park
- ❖ Alcyon Park
- ❖ Downtown Pitman
- ❖ Downtown Glassboro
- ❖ Rowan University
- ❖ Downtown Clayton
- ❖ Franklinville Lake
- ❖ Malaga Lake

Historic attractions

National Park

- ❖ **Red Bank Battlefield.** *On Delaware River.* The Pennsylvania Council of Safety erected Fort Mercer here to guard the river approach to Philadelphia from the British.
- ❖ **James Whitall, Jr. House** ca.1766. *Grove and Lakehurst Ave.* Private.
- ❖ **James and Ann Whitall House**, ca. 1748. *100 Hessian Avenue.* The builder's wife, Ann Whitall, was a sister of John Cooper, a member of the Continental Congress in 1776. Legend has it that during the attack on Fort Mercer in October, 1777, Whitall spun yarn here while the battle raged outside, and afterward nursed the injured Hessians. Private.

Woodbury

- ❖ **Chew House** Ca. late 18th C. *436 East Barber Ave., Private.*
- ❖ **Deptford Free School Building** Ca. 1774, *33 Delaware Street.* Originally built by Quakers as a one-story school, now the eastern-most section of City Hall.
- ❖ **Franklin House** Ca. 1765, *44 North Broad Street, private.* Oldest house in Woodbury.
- ❖ **General French House** ca. 1766. *136 South Broad Street, Private.* Once owned by a General in the Confederate Army. Samuel Gibbs French, though born in Mullica Hill, chose to fight on the side of the Confederacy.
- ❖ **Hunter-Lawrence House** ca. 1765. *58 North Broad Street.* Home of James Lawrence whose words, "Don't give up the ship," while mortally wounded 1813 on the deck of his Navy ship, have become famous. Now an 18-room museum open to the public.

- ❖ **Mickle House** ca. 1796, *SE corner of Delaware and Jackson Streets*, Private.
- ❖ **Mickle-Summerill House** ca 18th C. *30 North Broad Street*, Private
- ❖ **Myrtle Grove House** ca. 1803, *138 Delaware Street*, Private
- ❖ **Low-Cowan House** ca. 1770 *SW corner of Delaware and Horace Streets*, Private
- ❖ **Parish-Moore House** ca. early 19th century, *127 North Broad Street*, Private
- ❖ **Pillar-Barracks House** ca. 1806. *46-48 East Barber Avenue*, Private
- ❖ **Presbyterian Church at Woodbury** ca. 1834, *Corner S. Broad Street and W. Centre Street*
- ❖ **Tatum-Griscom House** ca. 1745, *Rugby Place*, private.
- ❖ **Wilkin's Inn or Paul Hotel**, ca. 1737, *111 North Broad Street*, private. Oldest inn in Gloucester County in continual operation.
- ❖ **Woodbury Friends Meeting House** ca. 1715, *North Broad Street*. Used as a hospital by the Hessians during the 1777 battle of Red Bank.

Woodbury Heights

- ❖ **La Pann House** ca. late 18th C., *407 Oak Street*. Private.

West Deptford Township

- ❖ **Cooper-Griscom House** ca. 1740s, *Griscom Lane in Greenfields Village*, private.
- ❖ **Knight Farm House** ca. early 19th C., *775 Salem Ave opposite Princeton Ave.*, Private.

Deptford Township

- ❖ **Benjamin Clark House** ca. late 18th C., *E side Woodbury-Glassboro Road*, private. Because of Clark's patriotic activities during the Revolutionary War, his home was raided several times by the British.
- ❖ **Nathan Ward House** ca. 1791, *Poplar Ave.*, Private.



County Courthouse, Woodbury Source: DVRPC, 2006

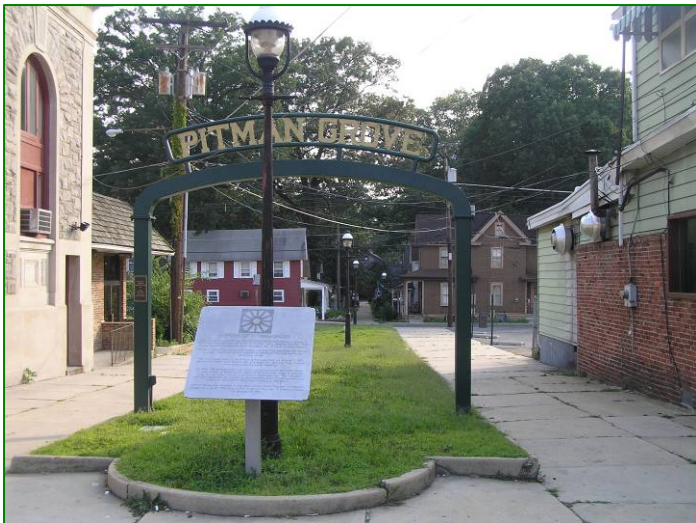


Veterans Park, adjacent to Vineland Secondary railroad, Woodbury Heights Source: DVRPC, 2006

SECTION 3: PROPOSED TRAIL NETWORK



Wenonah Park Source: DVRPC, 2006



Historic Pitman Grove Source: DVRPC, 2006

Wenonah

- ❖ **Stone House Inn** ca. 1773, *100 South West Avenue*, Private. Patriot meeting place.

Sewell

- ❖ **The Jesse Chew House**, Ca. 1772, *Mantua-Sewell Road, near the railroad bridge*, Private.

Pitman

- ❖ **Alcyon Lake** *Holly Ave.* Once the site of an Indian village.
- ❖ **Jessup-Lodge House** Ca. 1796, *SW corner Delsea Drive and Pitman Avenue*, Private.
- ❖ **Pitman Grove Camp Meeting**, Ca. 1871, *bounded by North, East, South, and West Avenues*. Named for Rev. Charles Pitman, a powerful camp meeting preacher of his day, founded in 1871 by a small group of Methodist ministers. Narrow walkways lined with visitor cottages radiate from a large auditorium, the focal point of the religious activity.

Glassboro

- ❖ **Stanger (Episcopal) Burial Ground**, *Main Street*. Final resting place of Glassboro's founding family and other early settlers. Some graves are marked with rough field stones without name or date.
- ❖ **Franklin Inn (Franklin House Hotel)**, Ca. 1790s, *Main and West Streets*, Private. Site of Glassboro's first tavern, built in the early 1770's. Hotel built by Col. Thomas Heston, who entertained the famous Gloucester Fox Hunting Club.
- ❖ **Hollybush Whitney Mansion**, Ca. 1849, *Whitney Avenue*. Handsome Victorian home built of locally-quarried sandstone by Thomas and Samuel Whitney, owners of the Whitney Glass Works. President Lyndon Johnson and Soviet Premier Alexi Kosygin held their famed summit here in June 1967.
- ❖ **St. Thomas Episcopal Church and Burial Ground**, Ca. 1846, *Main Street at Focer Street*
- ❖ **Whitney-Capie House**, Ca. 1860s, *29 West Street*, Private.

Clayton

- **Clevengor Brothers Glass Works, East Linden and Vine Streets,** Last of the area's old time glassblowers. Private.

Franklinville

- **Franklinville Inn, Ca. early 19th C., N.J. 47 and CR 538,** Private. Once a well-known stagecoach stop.

Public libraries

- **Franklin Township Public Library, Delsea Dr. S., Franklinville**
- **Glassboro Public Library, 2 Center Ave., Glassboro**
- **Gloucester County Historical Society Library, 17 Hunter St., Woodbury**
- **James H. Johnson Memorial Library, 670 Poplar Ave., Deptford**
- **McCowan Memorial Library, 45 Pitman Ave., Pitman**
- **Wenonah Public Library, Mantua & Clinton Aves., Wenonah**
- **West Deptford Public Library, South Jersey Environmental Information Center, Grove Ave. & Crown Point Rd., Thorofare**
- **Woodbury Free Public Library, 33 Delaware Street, Woodbury**

Trailhead parking, Hollywood Dell, Pitman Source: DVRPC, 2006

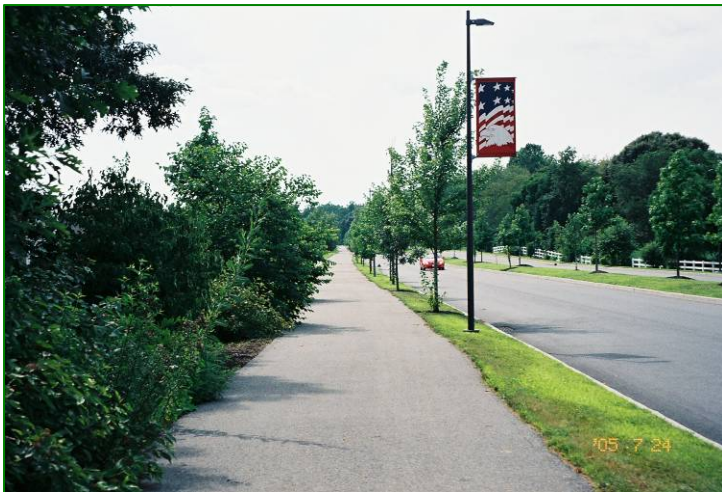


SECTION 3: PROPOSED TRAIL NETWORK



Judith E. Zaehring Bridge over Woodbury Creek, Woodbury

Source: DVRPC, 2006



West Deptford Bike Path Source: DVRPC, 2005

Segment 1: Red Bank Battlefield Park to Woodbury

Short-term alignment and alternatives

The route will use Hessian Avenue and Red Bank Avenue, shared roadways that are acceptable to most adult riders. Within the city of Woodbury, the route will take smaller streets, crossing the Woodbury Creek using a footbridge on the Woodbury High School property.

Long-term permanent alignment and alternatives

Although a wooded buffer exists between the south bank of Woodbury Creek and adjacent residences, it is relatively narrow in places, posing a challenge for garnering support for a trail.

Segment 1 Spur: West Deptford Community Center to Woodbury

Short-term alignment and alternatives

The route will utilize the existing 1.5 mile sidepath extending from the Community Center to Grove Street; and then follow Delaware Avenue, a shared roadway acceptable to most adult riders, into Woodbury.

Long-term permanent alignment and alternatives

Wooded open space, flanked by residential developments, exists along both banks of Matthews Branch, a tidal creek bordering Woodbury to the south. A connection with the Hester Branch skirting the city to the east may be possible through public recreation lands, residual undeveloped land, and local streets.

A more promising alignment lies along the south bank of Woodbury Creek, where a large proportion of the land is public park.

Segment 2: Woodbury to Glassboro

Short-term alignment and alternatives

The route will use local residential streets primarily.

Long-term permanent alignment and alternatives

Two principal alignment alternatives are identified, the principal being possible excess rail right-of-way along the Vineland Secondary railroad. This alignment provides the most direct route. The rail line is currently being considered for commuter service.

If rail-with-trail proves infeasible, an alternative alignment closely parallel to and west of the rail alignment follows residual open space and parkland along the Wenonah Run, Mantua Creek, and Chestnut Branch stream corridors. Paved and unpaved trails exist along a portion of this alignment, connecting Ceres Park in Mantua Township with Alcyon Park in Pitman Borough, passing underneath Route 55. An extension of the trail into Glassboro is planned by the Glassboro Economic Development Council.



Unpaved trail under Route 55 along Chestnut Branch, Mantua Twp.

Source: DVRPC, 2006

SECTION 3: PROPOSED TRAIL NETWORK

Table 5: Interim (short-term) route alignment, Town & Trains Trail

Road	Action	Miles	MP
Red Bank Battlefield Park	BEGIN		
Hessian Ave	EAST	1.1	1.1
Red Bank Ave	RIGHT	1.4	2.5
Frances Ave	RIGHT	0.1	2.6
Recreation facility pathway	STRAIGHT	0.1	2.7
Wood St	RIGHT	0.2	2.9
Delaware St	LEFT	0.05	2.95
Harrison St	RIGHT	0.2	3.15
W Centre St	LEFT	0.3	3.45
Railroad Ave (CR 133)	RIGHT	0.2	3.65
S Barber Ave (CR 649)	LEFT	0.3	3.95
S Evergreen Ave (CR 650)	RIGHT	0.1	4.05
Gantt Ave	LEFT	0.1	4.15
N West Jersey Ave	RIGHT	0.8	4.95
Princeton Blvd	LEFT	1.1	6.05
Ogden Rd/W Maple Ave	LEFT	0.3	6.35
N Clinton Ave	RIGHT	0.7	7.05
E Pine St	LEFT	0.1	7.15
S Marion Ave/Bark Bridge Rd	RIGHT	0.6	7.75
Glassboro Rd (CR 553)	RIGHT	0.7	8.45
Center St (CR 603)	RIGHT	0.9	9.35
New St (CR 629)	LEFT	0.3	9.65
Main St (CR 553A)/CR 553 ALT/N Main St (CR 553)	LEFT	4.1	13.75
State St	SLIGHT LEFT	0.1	13.85
Academy St	SLIGHT RIGHT	1.9	15.75
Fair View Ave (CR 637)	SLIGHT LEFT	0.9	16.65
Clayton Aura Rd/W Academy St (CR 610)	LEFT	2.9	19.55
Fries Mill Rd	RIGHT	2.2	21.75
Blackwood Ave	RIGHT	0.8	22.55
Coles Mill Rd	RIGHT	0.1	22.65
Franklinville Lake	END	22.65	

Source: DVRPC, 2008

Segment 3: Glassboro to Franklinville and Malaga

Short-term alignment and alternatives

The route would proceed southward along county roads through the village of Sewell, then proceed south on Broadway through Pitman, then primarily Main and Academy streets to just outside of Clayton.

Long-term permanent alignment and alternatives

The trail will proceed south from Glassboro along the abandoned Bridge-ton Secondary rail line which remains intact and unobstructed. The trail would then turn south using the east side of the Route 55 right-of-way, and along short connectors to Franklinville and Malaga lakes.

Table 6: RiverWinds Spur

Road	Action	Miles	MP
RiverWinds Park	BEGIN		
West Deptford Bike Path	EAST	1.3	
Delaware St	STRAIGHT	2	1.3
Harrison St/Alternate A	END SPUR	3.3	3.3

Source: DVRPC, 2008

Priorities and estimated costs

Priorities for the development of the Towns and Trains Trail are, in order:

1. **Develop route signage system, and sign interim (short-term) route. Stripe bike lanes where appropriate and feasible; and**
2. **Commission a feasibility study for the entire off-road trail.**

Costs for implementing the on-road route are estimated at \$28,000. Estimated construction costs for the off-road multi-use trail range from \$8 to 14 million.



Walking trail, Alcyon Park, Pitman [Source: DVRPC, 2006](#)



Scotland Run County Park, Clayton [Source: DVRPC, 2006](#)

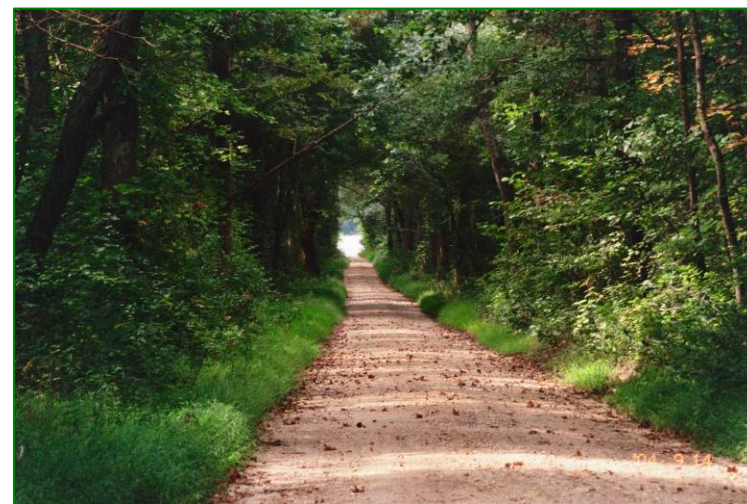
Little Ease Trail

The Little Ease Trail is named for the stream it will principally follow. This trail corridor is the least-defined of the four, extending through rapidly suburbanizing areas, rural areas, and ecologically-sensitive protected open space. Unlike the other trails, the Little Ease Trail does not pass through any of the county's historic towns. Consequently, it will provide access to fewer historic resources than the other trails and relatively more access to natural areas and active recreation.

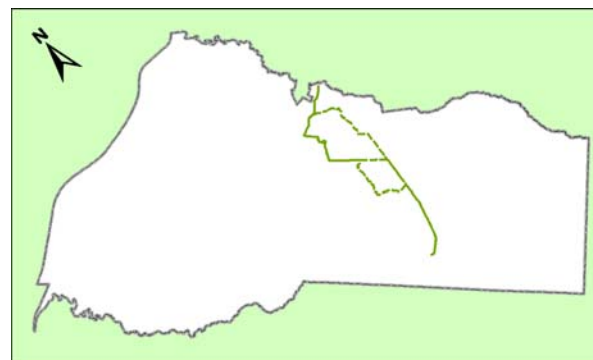
The corridor's suburban northern half presents a diffuse set of opportunities more characteristic of a trail network than a single linear trail. The trail is anticipated to link existing parks along stream corridors, building upon Washington Township's trails plan, the most extensive of any of the county's municipalities.

The trail will bisect the existing Monroe Township/Gloucester County Trail, providing access from Glassboro, Monroe, and Willamstown to rapidly growing Washington Township (and its huge municipal park complex) to the north, and Scotland Run Park to the south, while providing access to the trail from rapidly growing Washington Township and Turnersville. The Little Ease Trail will continue into Camden County to the north, connecting with the proposed trail along the alignment of the former Gloucester – Mt. Ephraim Branch of the Pennsylvania – Reading Seashore Lines.

Wetlands to the south and residential development to the north pose formidable constraints to trail development. Trail development within the Glassboro Wildlife Management Area must be carefully considered against a possible danger to trail users posed by hunting activities.



State Game Trail, Glassboro Wildlife Management Area, Clayton
Source: DVRPC, 2004



Interim route alignments Source: DVRPC, 2008

SECTION 3: PROPOSED TRAIL NETWORK



Fishing Pier, Scotland Run County Park, Clayton Source: DVRPC, 2006

Principal destinations

- ❖ Grenloch Lake Park
- ❖ Quay Park
- ❖ Washington Lake Park
- ❖ Bethel Mill County Park
- ❖ Glassboro Wildlife Management Area
- ❖ Scotland Run County Park
- ❖ Franklinville Lake Park
- ❖ Cross Keys Industrial Park
- ❖ Monroe Business Park
- ❖ Alamo Industrial Park
- ❖ Little Ease Park

Historic attractions

- ❖ **The Charles Quay Farm House** Ca. late 18th C. *Hurffville-Cross Keys Road, Washington Township.* Constructed with cedar clapboards; much of the interior is in its original state. Several Indian sites have been found on the 80-acre tract; a boundary marker is dated 1731. Current owner Charles Quay established one of the nation's largest private collections of antique farm implements and memorabilia. Private.
- ❖ **George Morgan House** ca. 1779. *Egg Harbor Road, 1 mi. east of Fairview Corners, Washington Township.* Private.
- ❖ **Bethel Methodist Church** ca. 1882. *Route 47, Hurffville* The third of successive church sanctuaries, the first dating back to the 1760s and established by an Irish immigrant.
- ❖ **Thomas W. Hurff Home (Haines Dairy Farm House)** ca. 1841. *Route 47 and Hurffville-Cross Keys Road, Hurffville.* The house still boasts the original handblown glass windows and woodwork that was hewn by hand axes right on the spot. A fine example of early 1840's architecture. Private.

Public libraries

- **Margaret E. Heggan Public Library** *208 E. Holly Ave., Hurffville*
- **Franklin Township Public Library** *Delsea Dr. S., Franklinville*

Segment 1: Grenloch Lake Park to Gloucester County Trail

Short-term alignment and alternatives

Three on-road interim routes have been identified, each beginning at Grenloch Lake Park near the Camden County line in Washington Township, and terminating on Fries Mill Road and intersecting with the Gloucester County Trail. Alternate A makes the most use of local residential streets in Washington Township, passing Bell's Lake; then uses Egg Harbor Road and Fries Mill Road, each a heavily traveled arterial but with adequate shoulders for bicycling. Alternates B and C go to Washington Lake Park via Hurffville-Grenloch Road and Hurffville-Cross Keys Road; then use the park trails to Greentree Road (a road with adequate shoulders), and then Pitman-Downer Road. Alternative B leaves Pitman-Downer Road and tracks south along a series of streets, taking a slight jog on Glassboro-Williamstown Road (US 322) to Moore Avenue, which enters the Glassboro Fish and Wildlife Management Area. From there, a series of turns on unpaved roads take the route to Fries Mill Road. Alternate C continues on Pitman-Downer Road to Fries Mill Road, and turns south, intersecting with the Gloucester County Trail.

Long-term permanent alignment and alternatives

Several options may exist for bringing the trail off-road through Washington Township. Most of the township's parks and open spaces are situated along stream corridors: Bells Lake Run, Duffield Run, Porch Branch, Mantua Creek. In addition, a sidepath may be feasible along a portion of Fries Mill Road. A trail network exists within Washington Lake Park, which the Township plans to extend to Quay Park at the intersection of Hurffville-Grenloch Road and Egg Harbor Road. A more detailed feasibility study is required to determine the best route through the township which makes the most of the opportunities at hand.



Trail, Washington Lake Park, Washington Twp. Source: DVRPC, 2006

SECTION 3: PROPOSED TRAIL NETWORK

Table 7: Interim (short-term) route alignment, Little Ease Trail

Alt A	Action	Miles
Grenloch Lake Park	BEGIN	
Park Ave/Hurffville-Grenloch Rd	WEST	1.51
Hurffville Rd	LEFT	1.4
Greentree Rd (CR 651)	LEFT	0.1
Greenview Dr	RIGHT	0.1
Bells Lake Rd/Dr	RIGHT	2.4
Hurffville-Cross Keys Rd (CR 654)	LEFT	0.5
Fries Mill Rd (CR 655)	RIGHT	6.9
Blackwood Ave (CR 657)	RIGHT	0.8
Coles Mill Rd (CR 538)	RIGHT	0.1
Franklinville Lake	END	13.81
Alt B	Action	Miles
Grenloch Lake Park	BEGIN	
Park Ave/Hurffville-Grenloch Rd	WEST	3.2
Hurffville-Cross Keys Rd	LEFT	0.8
Washington Lake Park Trail	RIGHT	1
Greentree Rd (CR 651)	RIGHT	0.9
Pitman-Downer Rd (CR 658)	LEFT	1.7
Derby Dr	RIGHT	0.3
Belmont Blvd	RIGHT	0.1
Glassboro-Cross Keys Rd	RIGHT	0.2
Flanagan Ave	LEFT	0.6
Moore Ave	STRAIGHT	1.3
Carpenter Ave	STRAIGHT	1.2
Whitney Ave	STRAIGHT	0.4
Fries Mill Rd (CR 655)	RIGHT	3.4
Blackwood Ave (CR 657)	RIGHT	0.8
Coles Mill Rd (CR 538)	RIGHT	0.1
Franklinville Lake	END	15.2

(continued next page)

Segment 2: Gloucester County Trail to Franklinville Lake Park

Short-term alignment and alternatives

The route proceeds south through rural areas using Fries Mill Road to Blackwood Avenue and Coles Mill Road, terminating at Franklinville Lake Park.

Long-term permanent alignment and alternatives

From its headwaters near Cross Keys Airport, Scotland Run flows south through Monroe Township into Franklin Township. Its riparian corridor, proposed as a greenway in the regional long-range plan, is characterized by forested wetlands, with much in public ownership. One alternative would follow this stream south from Glassboro-Cross Keys Road possibly alongside Cross Keys Industrial Airport Park, Scotland Run Golf Course, and Monroe Business Park, and utilize an existing trail through Scotland Run County Park.

A second alternative route would use roads through the Glassboro Wildlife Management Area to reach a trail which would be constructed along Little Ease Run, as yet an undeveloped riparian corridor parallel and to the west of Scotland Run, to Franklinville Lake.

Priorities and estimated costs

Priorities for the development of the Little Ease Trail are, in order:

1. **Develop a route signage system, and sign an interim route. Selecting a route which serves Washington Lake Park will help generate public support for eventual off-road trail development. Stripe bike lanes where appropriate and feasible;**
2. **Assist Washington Township in the implementation of its trail network plan. The most urgent need in this regard is the generation of public support for the trails;**
3. **Work with DVRPC and the townships of Washington, Monroe and Franklin to develop and implement a plan to establish greenways along Scotland Run and Little Ease Run; and**
4. **Commission a feasibility study for a multi-use trail connecting the Washington Township trail network with Franklinville Lake Park, evaluating the alternatives suggested in this report.**

Costs for signing the interim route are estimated at \$11,000. The construction cost for the permanent off-road multi-use trail is on the order of \$12.5 million.

Table 7: Interim (short-term) route alignment, Little Ease Trail
(continued from previous page)

Alt C	Action	Miles
Grenloch Lake Park	BEGIN	
Park Ave/Hurffville-Grenloch Rd	WEST	3.2
Hurffville-Cross Keys Rd	LEFT	0.8
Washington Lake Park Trail	RIGHT	1
Greentree Rd (CR 651)	RIGHT	0.9
Pitman-Downer Rd (CR 658)	LEFT	3.2
Fries Mill Rd (CR 655)	RIGHT	5
Blackwood Ave (CR 657)	RIGHT	0.8
Coles Mill Rd (CR 538)	RIGHT	0.1
Franklinville Lake	END	14.2

Source: DVRPC, 2008



Trail, Scotland Run County Park, Clayton Source: DVRPC, 2006



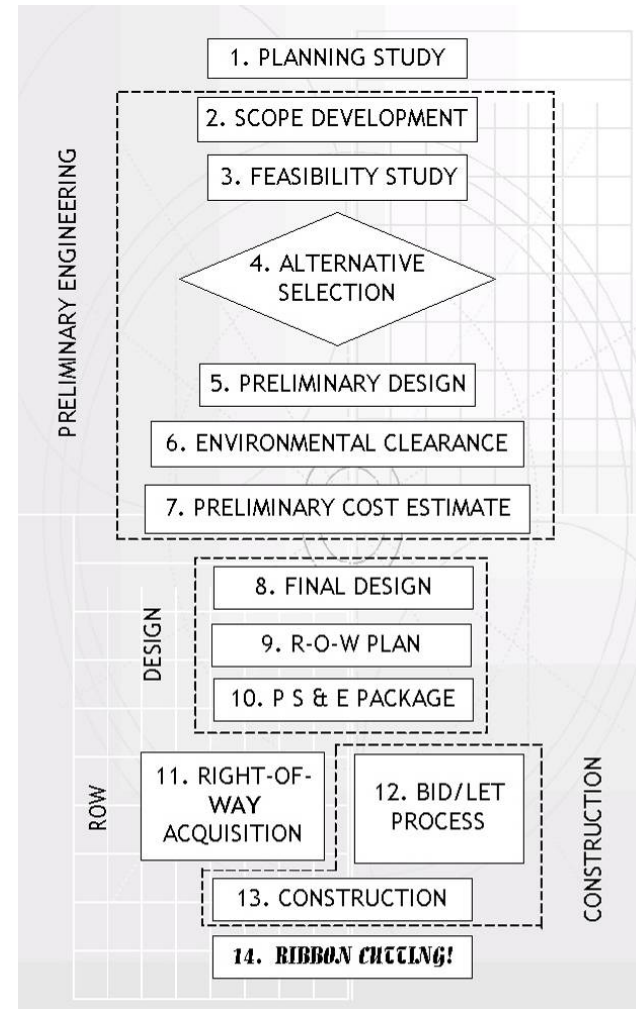
Implementation

This study offers a broad vision of a trails network for Gloucester County. Turning this vision into reality is an ambitious undertaking, requiring the endorsement and support of county and municipal governments, key stakeholders and the public. The details of location and design are yet to come; planners will not be able to answer how this vision will affect a particular homeowner’s property. Nonetheless, the vision is compelling, and it is important to communicate it to the public at this early stage.

In 1997, the Gloucester County Board of Chosen Freeholders adopted an open space and farmland preservation plan founded on a vision which includes a county-wide network of trails, bike paths, and nature walks along the stream corridors connecting a set of five to six regional parks. This report points the way toward realization of that vision. In formally resolving to adopt the recommendations of this study in whole or in part the Board serves notice to Planning Department staff to proceed with implementation.

Figure 7 at right illustrates schematically the trail development process. This study is represented by the box at the top of the chart, labeled “1. Planning Study.” The tasks which follow must be completed for each of the four proposed trails. Public involvement in each of the steps – preliminary engineering, design, right-of-way acquisition and construction -- is critical to the success of each trail project. Consultants should be selected which have a demonstrated track record in engaging the public in trail development projects. The Pennsylvania Department of Conservation and Natural Resources has developed a useful set of guides for

Figure 7: Trail development process



Source: DVRPC, 2008

SECTION 4: IMPLEMENTATION



Trail with active rail, Madison, WI Source: DVRPC, 2006



Trail through wildlife management area, Madison, WI Source: DVRPC, 2006

greenways and trails development, including guidance on consultant selection and a model RFP and scope of work, downloadable from its web site.¹⁵

Tables 8, 9, and 10, on pages 63 and 64, outline the status and next steps for each segment of the three proposed multi-use trails. Construction costs for the finished trail are presented for each segment. These costs were estimated using an online calculator¹⁶ based on an empirically-derived cost-benefit model developed by a research team led by the University of Minnesota.¹⁷

These costs are intended for programming purposes only. Costs will be refined at each stage of the trail development process, as design details materialize.

Stakeholders for the Gloucester County Trails Network, of course, include elected officials whose jurisdictions (the county and municipalities) will be affected by the Network, and their professional planning, engineering and management executive staff. Other stakeholders have control of land which might be needed for trail right-of-way, including rail rights-of-way, utility rights-of-way, golf courses, and possibly the Glassboro Wildlife Management Area; therefore, executives of Atlantic City

¹⁵ <http://www.pagreenways.org/toolboxdocuments.htm>, accessed 12/13/06.

¹⁶ <http://www.bicyclinginfo.org/bikecost/>

¹⁷ Krizek, Kevin J. et al., *NCHRP Report 552, Guidelines for Analysis of Investments in Bicycle Facilities*. Washington, DC: Transportation Research Board, 2006.

Electric, PATCO, Norfolk Southern Railroad, the New Jersey Department of Environmental Protection, the County Parks Commission, and public and private golf courses must be involved.

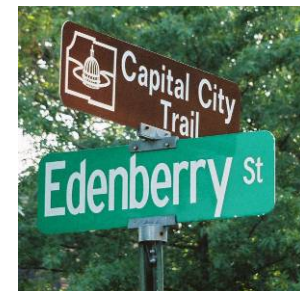
The public is the most important stakeholder. Before a county trails plan is formally adopted, the input of all stakeholders must be sought. A well-planned and well-executed public involvement process will ensure that all voices are heard. Without it, implementation will fail.

Trail planners' stories of difficulties negotiating with reluctant landowners are legion. Legal liability concerns top the list of reasons why a landowner cannot allow a trail easement. For every seeming obstacle to trail implementation, however, there are dozens of examples from across the country where trail implementers have successfully overcome them. A wealth of experience in building trails along active rail lines¹⁸ and even the margins of golf courses¹⁹ has been documented.

Unpreserved, developable land represents an important opportunity to establish trail alignments in Gloucester County. To take advantage of this, municipalities must establish trail routes and linkages through the

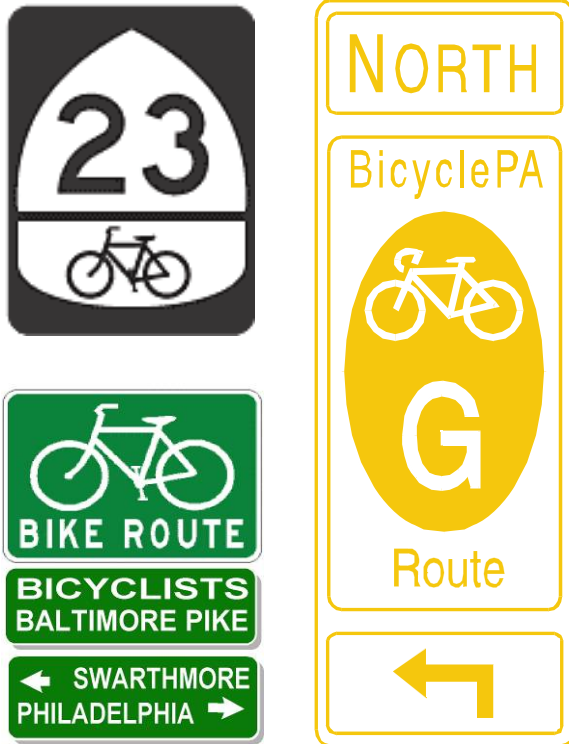
¹⁸ Smithers, Richard et al., *Rails-with-Trails: Design, Management and Operating Characteristics of 61 Trails Along Active Railroads*. Rails to Trails Conservancy and National Park Service, November 2000; see also Birk, Mia, et al., *Rails-with-Trails: Lessons Learned: Literature Review, Current Practices, Conclusions*. Washington, DC: US Department of Transportation, August 2002.

¹⁹ Alta Planning + Design, *Trails and Golf Courses: Best Practices on Design and Management*. July 2005.



Trail markers with logos Sources: East Coast Greenway Alliance, 2008; MCPC, 2008; Delaware Co. Planning Dept., 2006; DVRPC, 2006

SECTION 4: IMPLEMENTATION



Standard bike route markers

Sources: DVRPC, 2001; NCUTCD, PennDOT, 2008

municipal master plan and official map. Municipalities may amend the development code to require developers to include the trail in their development plans or otherwise pay for trail development.

Establishing an identity for the trail network. Public support for the trail network will grow to the degree that people know about it, understand it, and appreciate the opportunities it presents. Beyond the public involvement process, a public identity for the trails network should be established through a consistent route signage system to be installed as each section of the network is opened. A professionally designed logo can help establish trail identity while evoking a unique sense of place (see illustrations on the previous page).

The implementation of the interim on-road routes recommended in this report over the near term will quickly establish the trail network in the public mind, and may build momentum for the construction of multi-use trails.

Table 8: Implementation: Gloucester County Trail

Segment begin	Segment end	Alt	Description	Mi.	Status	Next step	Construction cost estimate, 2010
Flood Gate Park	Crown Point Rd (NJ 44)	A	Shared Road	1.5	Existing	Sign as trail	\$0
DREAM Park (proposed)	NJ Turnpike	B	Shared roads, I-295 right-of-way, Center Square Road sidepath, stream corridors SE of Swedesboro	6.5	ROW available along Center Square Rd & I-295. Paved trail currently extends 0.7 mi along Center Square Rd.	Complete trail along available ROW. Study feasibility of greenway trail around Swedesboro SE side past Narraticon Lake	\$7,000,000
Crown Point Rd (NJ 44)	NJ Turnpike	A	Greenway, alignment through future development	6.5	Undeveloped private land	Amend municipal plan & land development ordinance	\$7,700,000
NJ Turnpike	Mullica Hill	A	Raccoon Creek greenway	4	Greenway (undeveloped private land) adopted in regional, municipal plans	Implement greenway; study trail feasibility	\$2,520,000
Mullica Hill	Glassboro	A	Utility easement, reclaimed Williamstown Branch rail alignment	7.5	Mostly undeveloped private land	Study trail feasibility	\$6,420,000
Mullica Hill	Glassboro	B	Raccoon Creek & Clems Run greenways; utility easement into Glassboro WMA	10	Greenway (undeveloped private land) adopted in regional, municipal plans	Implement greenway; study trail feasibility	\$7,700,000
Glassboro	Williamstown	A	Gloucester County Trail; Monroe Twp. Bike Path	7	Paved trail open for use	Install trail system signage	\$220,000

Source: DVRPC, 2008

Table 9: Implementation: Little Ease Trail

Segment begin	Segment end	Alt	Description	Mi.	Status	Next steps	Construction cost estimate, 2010
Grenloch	Gloucester Co Trail	A	Bells Lake Branch, Wedgwood CC, Porch Run, Mantua Creek greenways; Gloucester Co. Tr.	10	Greenways in DVRPC regional open space plan	Adopt municipal greenways plan; study trail feasibility	\$4,000,000
Grenloch	Gloucester Co Trail	B	Bells Lake Branch greenway; Fries Mill Road sidepath; Scotland Run GC; Scotland Run greenway	9	Greenways in DVRPC regional open space plan	Adopt municipal greenways plan; study trail feasibility	\$5,100,000
Gloucester Co Trail	Franklinville Lake	A	Scotland Run greenway; powerline ROW	6	Greenway in DVRPC regional open space plan	Adopt municipal greenways plan; study trail feasibility	\$3,400,000
Gloucester Co Trail	Franklinville Lake	B	Glassboro WMA roads; Little Ease Run greenway	6	WMA is protected open space. Greenway in DVRPC regional open space plan	Adopt municipal greenways plan; study trail feasibility	\$3,000,000

Source: DVRPC, 2008

SECTION 4: IMPLEMENTATION

Table 10: Implementation: Towns and Trains Trail

Segment begin	Segment end	Alt	Description	Mi.	Status	Next steps	Construction cost estimate, 2010
West Deptford Rec Center	Woodbury	A	RiverWinds Drive sidepath; Delaware Street shared roadway	3	Existing facility	Sign as trail; evaluate road for bike lanes	\$0
Riverwinds Rec Center	Woodbury	B	RiverWinds Drive sidepath; Matthews Branch greenway	3	Non-continuous private woodland; public recreation; private golf course	Study trail feasibility	\$1,810,000
Woodbury	Wenonah	A	Woodbury Creek, Hester Branch greenways; Vineland Secondary rail-with-trail	4	Greenway mostly public parks; active freight line with possible future commuter service	Study trail feasibility	\$4,060,000
Woodbury	Wenonah	B	Stewart Lake greenway, NJ Turnpike ROW trail, greenway trail through open lands roughly bounded on the east by Delsea Dr. and Cattell Rd.	4.5	Public parks, private undeveloped upland forest; in DVRPC regional open space plan	Adopt municipal greenway	\$4,720,000
Wenonah	Glassboro	A	Vineland Secondary rail-with-trail	6	Active private freight line; possible future commuter service	Study trail feasibility	\$4,720,000
Wenonah	Glassboro	B	Chestnut Branch greenway; existing trails through Ceres, Hollywood, and Alcyon parks	6.5	Greenway in DVRPC regional open space plan	Adopt municipal greenway	\$5,920,000
Glassboro	Franklinville	A	Bridgeton Secondary rail-to-trail; NJ 55 ROW trail	7	Railroad ROW reverted, alignment remains intact; state highway ROW	Study trail feasibility	\$3,520,000
Glassboro	Malaga	B	Bridgeton Secondary rail-to-trail; NJ 55 ROW trail	12	Railroad ROW reverted, alignment remains intact; state highway ROW	Study trail feasibility	\$5,984,000

Source: DVRPC, 2008

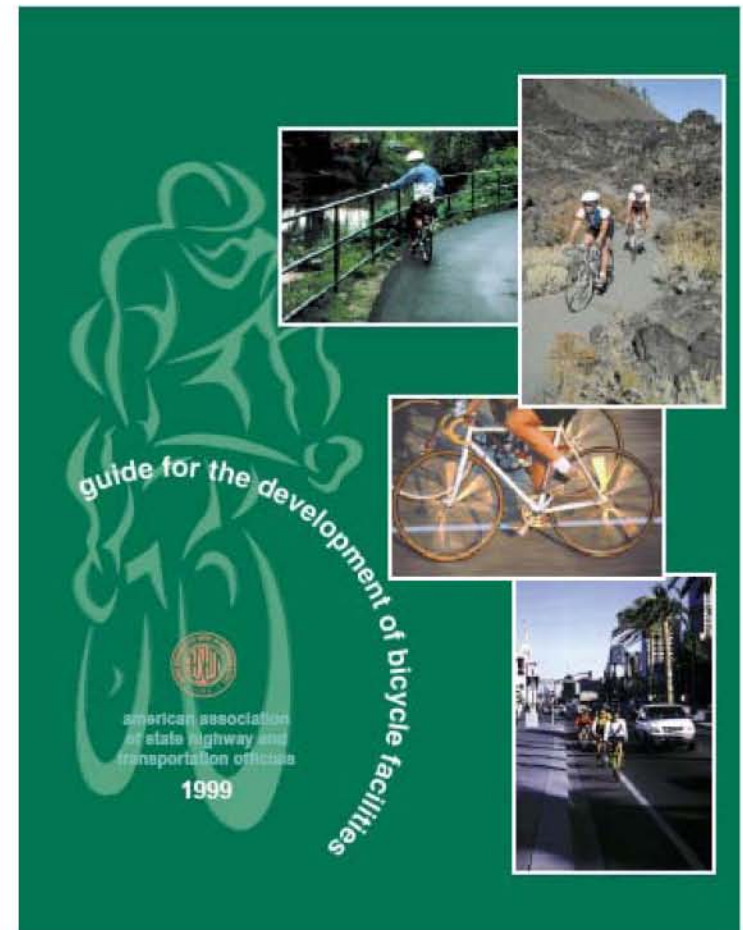
Appendix A:
Bicycle facility planning and design

Appendix A: Bicycle facility planning and design

Recent years have seen the development and refinement of standards and guidelines for bicycle facilities. The *Guide to the Development of Bicycle Facilities*, published by the American Association of State Highway and Transportation Officials (AASHTO) and updated in 1999 remains the principal reference. The *Manual on Uniform Traffic Control Devices* (MUTCD) has also been updated recently to reflect current practice. New Jersey DOT published its own design guidance, *Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines* (April 1996), largely based upon earlier versions of AASHTO Guide and MUTCD. NJDOT is in the process of updating its highway design manual to reflect current bikeway design practice. Likewise, the AASHTO *Policy on Geometric Design of Highways and Streets* (the “green book”) is undergoing a similar revision.

The operation of bicycles is covered under the state’s vehicle code. With several important exceptions (regarding licensing of driver and vehicle, and inspection of vehicles), bicyclists are governed by the same rules as motor vehicle drivers, including operation on the right side of the road, stopping, yielding, safe passing distance, and roadway position. Motorists are required to yield to a bicyclist in identical situations requiring the motorist to yield to another motorist. Motorists and bicyclists alike must yield to pedestrians.

The design of safe bicycle facilities is always based on the fact that the bicycle is considered a vehicle. Facilities that require, encourage, or lead bicyclists to contravene the rules of the road – such as failure to stop or yield at intersections (including driveways), or ride against traffic – are



more dangerous than no facility at all, and expose the roadway agency to legal liability. The best protection against damages and injury is a facility designed according to accepted guidelines and standards. Because most engineers are not familiar with current practice in this specialty, it is important that due diligence be exercised.

Facility types

There are several different types of bicycle facilities. Many engineers, news reporters, public officials, and lay people use the term “bike path” imprecisely in reference to any type of bicycle facility. It is important to learn the terminology. The definitions below are taken from the *AASHTO Guide for the Development of Bicycle Facilities* (1999).

The generic term “bicycle facilities” denotes improvements and provisions made by public agencies to accommodate or encourage bicycling, including parking and storage facilities, and shared roadways not specifically designated for bicycle use.

Bikeway is a generic term for any road, street, path, or way which in some manner is specifically designated for bicycle travel, regardless of whether such facilities are designated for the exclusive use of bicycles or are to be shared with other transportation modes.

A *shared-use path* (also called a *multi-use trail*) is a bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared-use paths will be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users in addition to bicyclists. (A shared-use path parallel and adjacent to a roadway, and usually within the highway right-of-way, is called a *sidepath*).



Sidepath Source: DVRPC, 2007

A *bicycle lane*, or *bike lane*, is a portion of a roadway which has been designated by striping, signing, and pavement markings for the preferential or exclusive use of bicyclists. Bike lanes are intended to delineate the right-of-way assigned to bicyclists and motorists and to provide for more predictable movements by each. They typically should not be applied to low-volume, low-speed streets and roads where most bicyclists can already ride comfortably.

A *shared roadway* is a roadway which is open to both bicycle and motor vehicle travel. This may be an existing roadway, street with wide curb lanes, or road with paved shoulders. Most bicycle travel occurs on such roads. In many instances no improvements are necessary to make bicycling on such roads more convenient or comfortable.

A *signed shared roadway* (signed *bike route*) is a shared roadway which has been designated by signing as a preferred route for bicycle use.

A *bicycle route system* is a system of bikeways designated by the jurisdiction having authority with appropriate directional and informational route markers, with or without specific bicycle route numbers. Bike routes should establish a continuous routing, but may be a combination of any and all types of bikeways.

AASHTO warnings about sidepaths

The AASHTO Guide warns against two-way shared use paths located immediately adjacent to a roadway. The arguments presented bear repeating here:

1. Unless separated, they require one direction of bicycle traffic to ride against motor vehicle traffic, contrary to normal rules of the road;



Bike lane Source: DVRPC, 2001



Shared roadway Source: DVRPC, 2001



Improperly designed bikeway



Source: DVRPC, 2001

2. When the path ends, bicyclists going against traffic will tend to continue to travel on the wrong side of the street. Likewise, bicyclists approaching a shared-use path often travel on the wrong side of the street in getting to the path. Wrong-way travel by bicyclists is a major cause of bicycle/automobile crashes and should be discouraged at every opportunity;
3. At intersections, motorists entering or crossing the roadway often will not notice bicyclists approaching from their right, as they are not expecting contra-flow vehicles. Motorists turning to exit the roadway may likewise fail to notice the bicyclist. Even bicyclists coming from the left often go unnoticed, especially when sight distances are limited;
4. Signs posted for roadway users are backwards for contra-flow bike traffic; therefore these cyclists are unable to read the information without stopping and turning around;
5. When the available right-of-way is too narrow to accommodate all highway and shared-use path features, it may be prudent to consider a reduction of the existing or proposed widths of the various highway (and bikeway) cross-sectional elements (i.e., lane and shoulder widths, etc.). However, any reduction to less than AASHTO Green Book (or other applicable) design criteria must be supported by a documented engineering analysis;
6. Many bicyclists will use the roadway instead of the shared use path because they have found the roadway to be more convenient, better maintained, or safer. Bicyclists using the roadway may be harassed by some motorists who feel that in all cases, bicyclists should be on the adjacent path;

7. Although the shared-use path should be given the same priority through intersections as the parallel highway, motorists falsely expect bicyclists to stop or yield at all cross-streets and driveways. Efforts to require or encourage bicyclists to yield or stop at each cross-street and driveway are inappropriate and frequently ignored by bicyclists;
8. Stopped cross-street motor vehicle traffic or vehicles exiting side streets or driveways may block the path crossing; and
9. Because of the proximity of motor vehicle traffic to opposing bicycle traffic, barriers are often necessary to keep motor vehicles out of shared use paths and bicyclists out of traffic lanes. These barriers can represent an obstruction to bicyclists and motorists, can complicate maintenance of the facility, and can cause other problems as well.

For the above reasons, other types of bikeways are likely to be better suited to accommodate bicycle traffic along highway corridors, depending upon traffic conditions. Shared-use paths should not be considered a substitute for street improvements even when the path is located adjacent to the highway, because many bicyclists will find it less convenient to ride on these paths compared with the streets, particularly for utility trips.

AASHTO warnings about sidewalks as bikeways

The section of the AASHTO guide cited above refers to paths specifically intended for bicycle use. The AASHTO guide also warns against the designation of sidewalks as bicycle routes:



Acceptable designs for bike lane intersection approaches



Source: John Boyle, 2003

- Sidewalks generally are not acceptable for bicycling. However, in a few limited situations, such as on long and narrow bridges and where bicyclists are incidental or infrequent users, the sidewalk can serve as an alternate facility... (p. 8-9);
- It is important to recognize that the development of extremely wide sidewalks does not necessarily add to the safety of sidewalk bicycle travel, since wide sidewalks encourage higher speed bicycle use and increase potential for conflicts with motor vehicles at intersections, as well as with pedestrians and fixed objects.... (p. 20); and
- Sidewalks are typically designed for pedestrian speeds and maneuverability and are not safe for higher speed bicycle use. Conflicts are common between pedestrians traveling at low speeds (exiting stores, parked cars, etc.) and bicyclists, as are conflicts with fixed objects (e.g., parking meters, utility poles, sign posts, bus benches, trees, fire hydrants, mail boxes, etc.) (p. 58).

Parking

Bicycle parking is an often-overlooked component in plans and programs to create bicycle facilities. Yet without a secure and convenient place to park at one's destination, the bicycle trip becomes impractical. More frequently, insufficient thought is given to the design and location of bicycle parking, resulting in little-used facilities which lack both security and convenience.

Bike racks should be placed as close to the building entrance as possible without obstructing pedestrian movement. Preference should be given to sheltered locations to protect bikes from the elements and from bird droppings.

A properly designed rack supports a bicycle in two places, and permits easy locking of the bicycle frame to the rack with the popular “U” lock. Racks that do not work, unless parking is supervised by an attendant, are the commonly used “dishrack” (or “schoolyard rack”) and a design variant called the “toast” rack. These designs support only a part of either wheel, leaving the bicycles open to theft or vandalism. The design of the “wave” rack is also flawed in that if used as intended support bikes at only one spot.

A basic, effective and increasingly popular rack is called the “inverted U.” It supports two bikes. The “A” rack is a variant of this design. Art, playfulness and whimsy have all been incorporated into bike racks that still meet the basic design requirements stated above.

Bicycle lockers provide a level of security and protection unmatched by racks. Their most common application is at commuter rail stations, where they are typically leased on a monthly or yearly basis. Lockers have not been installed anywhere in the study area. One of the largest bike locker installations in the U.S. is at the Princeton Junction rail station on New Jersey Transit’s Northeast Corridor line. The Greater Mercer Transportation Management Association manages locker leasing and maintenance. There is currently a waiting list to lease the lockers.

A growing number of municipalities are writing bicycle parking requirements into their zoning and development codes.



Bicycle parking: utilitarian (above) and fanciful (below)



Sources: DVRPC, 2002; John Boyle, 2005

Gloucester County Multi-Use Trails Network Study

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Date Published: March 2008

Geographic Area Covered: Gloucester County, New Jersey

Key words: multi-use trails, bikeways, greenways

Abstract: This report presents the results of a study of opportunities to create a county-wide network of routes for non-motorized travel serving important destinations including recreational areas, employment centers, schools, transportation facilities, and existing trails, culminating with a sketch plan for a network of four cross-county routes.

Comprised of multi-use trails to the maximum extent possible, the network will incorporate existing trails; disused, abandoned and active rail rights-of-way; utility easements, open space corridors, and highway rights-of-way, using shared roadways where needed to connect discontinuous trail segments and link nearby destinations. For each route, an interim alignment using existing roads and trails is recommended for immediate signing, to create a public identity; and potential off-road trail alignments are described. An implementation strategy and preliminary construction costs for each route are presented.

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