

# Cumberland County Bike Trail Study

## Executive Summary

Bicycles and Bicycling are universal symbols of healthful living, caring for the environment, leisure activity, low cost and efficient modes of transportation, freedom and youth. This universal appeal causes bicycles to be used in numerous advertising commercials for all sorts of goods and services. Bicycles get your attention. They appeal to everyone. Communities that fully embrace bicycles and bicycling are among the most desirable places to live and can be vacation destinations for bicycle touring as well. Using bicycles improves a community's quality of life by 'slowing the pace', reducing air and noise pollution, increasing personal health and helping to make the community feel safer.

The Cumberland County Bike Trail Study provides a comprehensive review of actions, system improvements and programs that can help advance bicycling for local transportation and recreation uses as well as for attracting bicycle touring and events. The Bike Trail Study provides recommendations that integrate or expand bicycling into existing County efforts such as the County Ecotourism Plan, the County Transportation Master Plan and regional bicycle safety programs.

A central component of the Study is a mapping effort that evaluates 300 miles of County roadways for bicycle compatibility. A county bike route network is also recommended for many of those roads (on shoulders) along with suggested improvements to enhance the attraction and safety for bicycling. Several potential trail facility locations such as abandoned railroad corridors and other separate trail locations through State Wildlife Management Areas are offered.

Another central component of the Study is a number of suggested programmatic strategies for attracting bicycling to the County in various forms ranging from local and regional vacationing, ecotourism, bicycle races and charity bicycle rides. Features and services that attract bicyclists to an area, how the County might go about advertising its fine bicycling environment and references to other outside resources and organizations that could aid in the County's effort are presented.

Funding opportunities from all levels of government, commercial and nonprofit private sectors to noted resources and organizations are provided. The County may draw from these additional resources to advance multiple levels of bicycling involvement and leverage in-house County efforts.

The majority of Cumberland County's roads are favorable for bicycling by virtue of their wide shoulders or very low traffic volumes. Low cost enhancements in the form of signs and stenciling can serve to attract bicyclists to these roadways. The Study presents recommendations to this end. It also cites several NJDOT studies that provide in-depth bicycle compatibility evaluations and specific recommendations for bicycle improvements on several State highways through the County.

Cumberland County's proximity to popular shore communities (a manageable bicycling distance away from the shore crowds) could be promoted as a particularly attractive bicycling destination. Cumberland County's flat terrain, open spaces, low traffic roads, environmental, educational and historic attractions all serve to make Cumberland County an attractive destination for bicyclists. This Study provides a framework to advance and promote all of what Cumberland County has to offer bicycling transportation and recreation.



# I - Introduction

## A. Goals and Objectives of the Bike Trail Study

Bicycling has steadily increased in popularity as both a mode of transportation and a recreational activity over the past decade. While most of this growth has been in off-road/mountain biking, road bicycling has continued to grow. In recent reaction to this increased interest in bicycling, realizing that bicycling (and pedestrianism) are important activities to an improved quality of life, political forces and funding have responded in kind.

Forty years of land planning and transportation has been centered on the automobile. This has provided us with a vast network of good roads, but at the same time, it has made us dependent on traveling farther and farther distances. This Study is an outgrowth of the renewed interest in bicycling for transportation and recreation.

The following represents the County's initial goals and objectives for this Study:

- To identify roads throughout the County that can safely accommodate bicycle traffic in accordance with State and other standards.
- To explore the use of public lands for trail opportunities.
- To explore abandoned rail corridors for "Rail Trail" opportunities and to explore other utility rights-of-way for potential trail facilities.
- To integrate Cumberland County's effort with neighboring county and municipal bike plans.
- To identify bicycle parking needs and opportunities.

The following additional Goals and Objectives are provided to help frame the broader vision and potential impact of the study:

- To provide direction to proposed improvements aimed at making Cumberland County safer and more inviting to bicycling.
- To more formally legitimize bicycling as a recognized vehicle on the County level. This Report or portions hereof, are intended to be incorporated into the Transportation element of the County's Master Plan.
- Provide new and current information related to bicycle travel in Cumberland County.
- Integrate all existing and new bicycling information that can assist the decision making process in order to have Cumberland County develop into an attractive and inviting destination for bicyclists
- Provide a "bicycle element" to the County's Ecotourism Plan.
- Provide information that can assist in increasing the use of bicycles in the County for local transportation and recreation.
- Serve as a model for future bicycle planning efforts in the County

The primary element of this current Bike Trail Study is an extensive mapping effort that:

- Categorize a significant portion of the County roadway network as to its compatibility with safe and pleasurable bicycling
- Identifies desire lines for bicycle transportation



- Provides a basis for establishing and prioritizing bicycle routes
- Maps potential new bicycle trails

The map should also be able to form the basis of bicycle touring information materials for general public distribution.

A second principal element of this report is guidance on those features, amenities and enticements that could attract bicyclists to Cumberland County. In other words, this report provides answers to the question; “what do bicyclists like that will make them want to come to Cumberland County?”

Other elements of this report are outlined in the Table of Contents. They are geared toward providing a comprehensive framework to allow Cumberland County to move forward with enhancing the County for bicycling for local residents and attracting more bicyclists to enjoy their recreation within Cumberland County.

## B. Bicycle Planning Concepts

### θ Facilities

Types of “bicycle facilities” include:

- **Shared Lane** where no shoulder exists along a roadway and cyclists and motor vehicles share a common travel lane.
- **Bike Lane** where striping along (as in a shoulder) or within (as through intersections) a motor vehicle roadway.
- **Separate Shared Use Facility** separated from motorized traffic, where all sorts of users may be expected to recreate, such as bicyclists of all types, in-line skaters, joggers, walkers, etc.

These types of facilities are often referred to as “Class III, II, and I facilities”, respectively. Cumberland County has an exceptional network of bicycle compatible roadways (roads with wide shoulders), therefore these road shoulders should be expected to form the basis for the County’s bicycle route network.

All roads are open to bicycle travel (except for limited access highways including toll roads). In New Jersey, even the interstate highway system is accessible to bicyclists as long as they obtain a free Permit from the NJ Department of Transportation through the office of the Bicycle and Pedestrian Advocate. It is therefore incumbent upon roadway purveyors to provide facilities that safely accommodate bicycle traffic just as they recognize the safety requirements of automobile traffic. The AASHTO Guide for the Development of Bicycle Facilities states: “*All highways, except those where cyclists are legally prohibited, should be designed and constructed under the assumption that they will be used by bicyclists. Bicycle safe design practices should be followed to avoid the necessity for costly subsequent improvements.*”<sup>1</sup>

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<sup>1</sup> *Guide to the Development of Bicycle Facilities*, American Association of State Highway Transportation Officials, 1999



A second notion rarely considered a planning concept is that *bicycles are vehicles*. According to state traffic law, bicycles are granted all of the rights and all of the responsibilities as other drivers when operated on the highway. This means that bicyclists must drive bicycles as they would any other vehicle on the roadways, subject to certain restrictions evident by their slower speed. They must follow “the rules of the road”. Primarily, bicycles must keep as far to the right as practicable. They may move to the left when avoiding debris, passing a slower vehicle or turning left. The reason for this is based in the uniform traffic law, which provides for one set of rules for all highway users. All wheeled vehicles follow the same rules and pedestrians follow rules established to promote the greatest safety of themselves as well as other highway users (including bicyclists). NJ Statutes Title 39 (Traffic Law) requires skateboarders and in-line skaters to also follow the rules of the road. Failure to observe traffic law while operating a bicycle is based in an almost total lack of traffic safety education, in elementary school through high school. For all the ubiquity of traffic and driving in our society, the amount of formal traffic education that is provided is sorely lacking.

This is an important bicycle facilities planning (and design) concept, because if the bicycle facilities do not guide the users to operate properly, the users of the facility may ultimately be directed to behave illegally and dangerously along the roadways, or upon entering or leaving the bike facility. Further, poor bike facility designs “train” users to practice dangerous and illegal cycling behavior on roadways when no bike facility exists. Just as roadways are scrupulously designed for one set of rules, so should bicycle-accessible facilities, particularly where separate facilities are provided and they encounter motor vehicle roadways.

The same concepts of vehicular rules and “training the users” on roadway bike facilities should govern the planning and design of separate facilities. Special attention should be paid where such facilities begin at or intersect with vehicular roadways. Here both motorists and separate facility users need to be notified through signing and striping on the roadways and the “trail” respectively. Transitions between separate facilities and roadways also deserve special attention in order to prevent the user from riding the wrong way on the road. One-way separate bike facilities should never be considered.

## θ Bike Facility Users

The type of individuals expected to use a particular facility is a concept that is frequently raised when planning bicycle facilities. There are a couple of different ways of classifying types of users, but the classification of users itself needs to be understood as to its purpose and its limitations in bicycle planning. This will be addressed after presenting one user classification system.

A common bicycle user classification method is to identify bicyclists as type **A, B and C**<sup>2</sup>.

- **Advanced** or experienced riders who travel longer distances (10 miles and more) by bicycle generally easily integrate with motor vehicle traffic. They typically (and correctly) operate their bicycles on the roadways as they would operate a motorized vehicle.
- **Basic** or less confident riders who use bicycles for short trips, perhaps fairly frequently. They may use roadways, but will generally avoid those roads with faster traffic and more trucks,

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<sup>2</sup> *Selecting Roadway Design Treatments to Accommodate Bicycles* (Publication No. FHWA-RD-92-073), Federal Highway Administration, January 1994



preferring instead to use neighborhood streets or shared use paths. They would also prefer to use designated facilities such as bike lanes or wide shoulders on busier streets.

- Children riding on their own or with their parents or Casual cyclists who prefer neighborhood streets and separate (from traffic) shared use facilities/pathways. Very young children (below the age of about 5) would be expected to ride exclusively on separate shared use pathways or (because of their age and size) sidewalks with parent close by.

Anticipating the users of a facility and then designing a facility to accommodate them is an approach which often results in facilities that are inadequate and under-used. Planning and design of bicycle facilities should be approached with the idea of implementing the best facility as can be provided in the given situation. Bike facilities that are integrated into roadways should include some bicycle-related signage at a minimum with striped bike lanes as may be needed in high traffic areas or desired to enhance a more rural situation (wide shoulders, for example).

### θ Facilities and Users - Summary

Separate (from traffic) facilities should be designed to accommodate all possible users from Advanced bicyclists to Children as well as in-line skaters, joggers, strollers/baby carriages and walkers/hikers. The approach to planning and design of a facility by “anticipating” that a limited type or group of users would be present on a facility tends to impart the view of a lower caliber facility. Facilities should be approached with the expectation that “if you build it, they will come.” Therefore, facilities need to be designed with the best practice available for the situation.

To sum up all of the components in a complete bicycle planning document, “**The Four E’s**” have often been cited:

- θ **Engineering** (and Planning)
- θ **Education**
- θ **Enforcement**
- θ **Encouragement**

Where:

- Engineering / Planning is self-evident.
- Bicycle (and more broadly, traffic safety) Education efforts should be addressed for younger as well as adult sectors of the population. Even the best of facilities can be used improperly or even dangerously.
- Enforcement of existing laws regarding operation of bicycles on the roadways needs to be taken seriously. Perhaps not punitively, but through positive reinforcement.
- Encouragement of use of bicycles and walking are favored as modes of transportation through the above “E’s” and through efforts to bring bicycle-related activities to local events and to the region.

### C. Bridgeton, Millville, Vineland and State Highways

The scope of the County Bike Trail Study is planning for County wide bicycle circulation. This Study does not address bicycle circulation within Cumberland County’s three major population centers; Bridgeton, Millville and Vineland. This is a significant omission to bicycle planning in the



County, but in practical terms these local planning efforts require attention and detail beyond the scope of the Study. The level of detailed examination of bicycle circulation in each city warrants separate circulation plans and site-specific design considerations.

Additional studies for the cities would look at local bicycle use primarily as modes of transportation over relatively short distances (around 5 miles and less). They would designate specific routes and locations for bikeways and provide many preliminary site-specific design (striping and signing plan) recommendations. This current study looks at bicycle access over cross-county distances of 24 to 30 miles or inter-city distances of 6 to 12 miles. Local bicycle planning for Bridgeton, Millville and Vineland would look at existing bicycle travel patterns and seek to advance those corridors with appropriate bicycle facilities as well as identify new routes. It would provide suggestions for low cost improvements / enhancements that would transform opportunities of existing conditions in order to favor or encourage bicycle travel.

State Highways are subject to NJDOT jurisdiction and were not evaluated as part of this Study. In recent years, the NJDOT has undertaken the most aggressive efforts in its history to address bicyclist (and pedestrian) access to the state highway system. This effort has resulted in numerous investigations/studies of many highways, looking at bicycle and pedestrian compatibility or lack thereof, and offering recommendations to rectify deficiencies so as to better accommodate these users. Several studies sponsored by the NJDOT have looked at highways in Cumberland, notably, Route 49 and the Routes 47 and 55 interchange and Cumberland Mall access.

These NJDOT reports and memoranda provide detailed study and recommendations to enhance the conditions for bicycling (and walking) at specific sites in Cumberland County. Similar to the necessary level of detail of local bicycle plans, these studies go far beyond the scope of countywide bicycle circulation and therefore are, advantageously, a few steps ahead of the planning process.

By incorporating key recommendations and by referencing the DOT reports in this Study, the County can adopt the DOT recommendations into its own planning and improvement process. Further, Cumberland County should hold the NJDOT accountable for implementing the recommended improvements as soon as possible. Adoption of this Countywide Bike Trail Study / bicycle circulation plan by the County should help prompt the DOT to move forward with the recommended improvements. The greatest advantage to improving state highways for bicycle (and pedestrian) travel is that the cost for such improvements would be borne by the State.



## II. Cumberland County Bikeway Plan

### A. Roadways

Roadways provide the most extensive network of transportation facilities second to none. They provide virtual door-to-door access to all destinations and in many cases link to drive-through service facilities. All roads are open to bicycles in New Jersey (excepting limited access highways). In Cumberland County all roads are open to bicycle travel. Even state highway 55, which by design appears to be a limited access Interstate highway, is actually available to bicycle travel. Given Route 55's wide shoulders, lack of intersections and driveways, it is very suitable and safe for bicycling although its paved surface is somewhat rougher than it should be for good bicycling.

While all roads are open to bicycle travel, not all roads are particularly suitable or "compatible" for bicycling. Basic factors that determine bicycle compatibility of a roadway include pavement (shoulders and/or vehicle lanes) width, traffic speed and traffic volume. The most important factor of these variables is pavement width. Bicycle compatibility of a roadway necessitates that there be adequate width for both motor vehicle and bicycle traffic to travel in the same direction without changing lanes to pass. In most cases, a roadway's failure to be compatible with bicycling is because there is insufficient space for the bicycle to occupy without requiring a motorist to cross into the oncoming lane in order to safely pass the bicyclist.

The good news in Cumberland County is that many of the County roads are constructed with wide, smooth shoulders that are suitable for bicycle travel. Motor vehicle travel is unencumbered when there are bicyclists present. In most areas of Cumberland County where the roads are not equipped with shoulders and travel lanes are too narrow for shared use, current traffic volumes are so low that the roads are not at all uncomfortable for bicycling and indeed may be even more pleasant for bicycling than higher volume roads with wide shoulders. Most of the existing published routes follow roads of this type, but by strict NJDOT Guideline criteria, these roads are not bicycle compatible.<sup>1</sup>

#### Roadway Mapping of Bicycle Compatibility

Appendix III presents the collected data and results of evaluating nearly 300 miles of County Roadways for bicycle compatibility. The evaluation criteria for bicycle compatibility used in this Study is based on Table 1, *Bicycle Compatible Roadway Pavement Widths of NJDOT Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines*, April, 1996. These are *minimum* bicycle compatible criteria adopted by the NJDOT based on experience and documentation from across the US. The evaluation criteria from Table 1 is embedded into the spreadsheet as a program in order to yield the TRUE or FALSE result indicated on the printed sheets. The Data for these evaluations were obtained from the following sources:

- Field measurements of pavement widths
- Field observation of posted speed limits

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<sup>1</sup> See Appendix II – Published Bike Routes which cross-references resources listed in the Bibliography and on the Bike Trail Study Maps.



- Current (since 1998) comprehensive traffic volume data provided by the Office of the Cumberland County Engineer.

A digitized copy of the evaluation spreadsheet is provided to the County as part of this Study. The spreadsheet can be used to evaluate any other roadways for bicycle compatibility that have not been evaluated for this Study. Further, the spreadsheet may be used to determine what improvements would yield bike compatibility of the roadway.

It is important to note that several types of hazards or constraints to bicycle traffic were not included in the evaluations:

- Pavement conditions, although the vast majority of observed roads in the County were in good repair.
- Influence of roadway intersections on bicycle traffic. Intersections configured with lane striping to accommodate vehicle turns, commonly fail to consider bicycle traffic.
- Stream flow or other type of non-bicycle safe drainage inlet grates
- The presence of debris (sand, gravel, glass, trash, etc.) on the roadways.
- Railroad crossings – especially tracks that cross roadways skewed diagonally – are particularly hazardous to bicyclists.

These point hazards and constraints were not included in the evaluations, nor in the mapping. If they were to be included in the mapping, they would be identified as red (non-bicycle compatible) segments or spot points. Correcting these conditions would be necessary prior to formally establishing the bike routes.

The NJDOT Table 1. bicycle compatible criteria are very specific. While many roadways with very low traffic volumes are attractive and appear suitable for bicycle travel, they do not meet the compatible criteria, indicated as red on the Study Map. This does not mean however, that these roads should prohibit bicycle traffic. The results of this study identify those roads that are not bicycle compatible and provide recommendations for improving the “bicycleability” of those roads using accepted, standard means. For example, “*Share the Road*” signs placed at one-half or one-quarter mile intervals is one low cost way that can enhance awareness and legitimacy (and presumably safety) of bicycle traffic on narrow rural roads.

Intersections present a unique set of parameters to bicyclists that vary considerably depending upon location. Designing bicycle compatibility into intersections requires a detailed assessment for each intersection, separately. As with the level of detail required in evaluating bike routes within the county’s three cities, this detail of identifying every spot constraint on County roadways is beyond the scope of this Study. The investigations and recommendations of this Study do not examine intersections as a rule, but some examples of non-bicycle compatible intersections as well as suggested mitigation techniques are presented at various points throughout this report.

## 1. State Highways

Five highways under the jurisdiction of the NJDOT (Routes 47, 49, 55, 56 and 77) are located in and/or traverse Cumberland County. East-West Route 49 fully bisects the County and links two of



the three major cities, Bridgeton and Millville. North-South Route 47 links Vineland and Millville. Both highways cross the southeast portion of the Cumberland County line at Atlantic and Cape May counties. Route 47 is a primary link to Cumberland County with the NJ Turnpike, Interstate 295 and the Camden/Philadelphia region. Route 55 was constructed as a Rte.47 bypass around Vineland and Millville. Although Route 55 appears to be an Interstate highway by design, its status as a state roadway makes it fully accessible to bicycle traffic. In fact, the South Jersey Wheelmen (SJW) bicycle club convinced the NJDOT to remove or erase the “Bicycles Prohibited” signs from the entry ramps to Route 55 according to a SJW representative at a County meeting held for this Bike Trail Study.

Two NJDOT studies regarding bicycle compatibility of state highways in Cumberland County include the Route 55/Route 47 and Cumberland Mall area.<sup>2,3</sup> By reference to these two documents, the recommendations for improving bicycling conditions cited therein should be adopted by Cumberland County as part of this Bike Trail Study.

Route 49 links Cumberland County to Salem city / Salem County and the Delaware Memorial Bridge at Wilmington, DE. In Millville, Route 49 connects with Route 47, providing the most direct link with the southern portion of Cape May County. The NJDOT has conducted a substantial bicycle and pedestrian compatibility study of Route 49<sup>4</sup>. That document contains a series of studies that provide detailed analysis and recommendations for improving conditions for bicycling at key locations along the Route 49 corridor from Fort Mott to the City of Millville. Three studies included therein refer to locations in Cumberland County: The Borough of Shiloh, the City of Bridgeton, and the City of Millville.<sup>5,6,7</sup> By reference to these documents, the recommendations for improving bicycling conditions cited therein should be adopted by Cumberland County as part of this Bike Trail Study. It should be noted that the NJDOT has placed improvements for Routes 47 and 49, including bicycle compatibility provisions, on a fast track.

As stated in the Introduction to this Study, improvements to state highways for bicycle (and pedestrian) accessibility would necessarily be paid for by the State. It would therefore be to the County’s advantage to move on the NJDOT, the SJTPO, MPO’s and other official transportation entities to get the improvements listed in the NJDOT capital improvement program pipeline.

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<sup>2</sup> Lehr & Associates, Inc., Memo to NJDOT Bicycle and Pedestrian Advocate William Feldman, Re: Route 47/55 Section 10-D

<sup>3</sup> Lehr & Associates, Inc. Memo to NJDOT Bicycle and Pedestrian Advocate William Feldman, Re: Route 47 and 55 Interchange, Reconstruction of the Cumberland Mall driveway intersection with Route 47.

<sup>4</sup> NJ Department of Transportation, by: Lehr & Associates, Inc., Frederic R. Harris, Inc., *Route 49 Bicycle and Pedestrian Compatibility Analysis*, Conceptual Development Report, January 25, 1999.

<sup>5</sup> Lehr & Associates, Inc., Frederic R. Harris, Inc., for NJDOT, Concept Development Report, Route 49 Bicycle and Pedestrian Compatibility Analysis, Borough of Shiloh - Final Draft, January 25, 1999.

<sup>6</sup> Lehr & Associates, Inc., Frederic R. Harris, Inc., for NJDOT, *Concept Development Report, Route 49 Bicycle and Pedestrian Compatibility Analysis, City of Bridgeton, Including Bridge over Cohansey River – Final Draft*, January 25, 1999.

<sup>7</sup> Lehr & Associates, Inc., Frederic R. Harris, Inc., for NJDOT, *Concept Development Report, Route 49 Bicycle and Pedestrian Compatibility Analysis, City of Millville, Including Bridge over Maurice River – Final Draft*, January 25, 1999.



The Roadway Bicycle Compatibility mapping layer for this Study depicts all segments of state highways in a separate green color code implying, as indicated in the DOT reports, that the state highways are mostly bicycle compatible. The maps do not indicate the segments where bicycle constraints are identified or improvements are called for in the DOT reports.

## 2. Published Routes

- a. Numerous guidebooks exist which provide maps and descriptions of pre-selected routes that the authors found to be inviting or attractive for bicycling. Many contain particular destinations which cyclists may find interesting. Those rides are of varying lengths and of varying terrains (although in Cumberland County there are few sizeable hills) travel through areas with relatively high volumes of traffic. Published bike ride routes are virtually exclusively for recreational purposes. The published route references are included in the Bibliography and Appendix II

For this study, we have selected a number of these routes and plotted them on a separate *Published Routes* mapping layer. A copy of this map is included in the back of this report. We attempted to provide available routes that covered as many areas of the County as possible. This Study does not attempt to, nor is it intended to be all-inclusive of all published routes. Owing to the exclusive recreational nature of published bike routes, they would not be expected to fulfill bicycle transportation (commuting, utilitarian) needs of the local population. Presentation of these published routes as part of this study is not to be intended as sanctioning the roads or facilities for bicycle suitability or compatibility by *Bikeways Engineering, Inc.* or by the County of Cumberland. The published bike routes are identified in this study for informational purposes only.

- b. One significant route that is currently in the planning stages by NJDOT is the **High Point to Cape May Bicycle Touring Route**. This is an effort born in part from Governor Whitman's initiative to establish 1,000 to 2,000 miles of bike facilities within 5 to 10 years. A primary objective of the High Point to Cape May route is to establish a central-state "spine" route, from which local and regional connector routes can branch out. The final selected alignment of the main route does not cross into Cumberland County, instead keeping to the east. As well, the route does not enter Camden, Gloucester or Salem Counties nor many other counties in the North. But this state DOT initiative should be capitalized upon by Cumberland County for linking spur route(s) from / to it in order to advance bicycle touring / ecotourism visitation. The DOT has recently acknowledged the need to provide assistance to other Counties (Cumberland in particular) in linking with the main route. Such assistance would likely include planning and development funding as well as the associated advertising through the Department's WWWeb page, and materials distribution agency, including the State Office of Tourism.

During development of the High Point to Cape May route, a westerly alternative route was considered that did traverse into Camden, Gloucester and Cumberland counties, entering Cumberland County from the area of Parvin State Park. The route was identified by Glenn Koerner and Art Shalik of the South Jersey Wheelmen bicycle club. Formal identification and establishment of this loop through Cumberland County as a



spur or alternate route to the main High Point to Cape May bike route would have to be coordinated with the counties of Atlantic, Camden and Gloucester in order for the loop to be complete. For this reason, it has not been included on the mapping for this Study. However, this spur Route development should be pursued by the County (with other Counties) in light of recent DOT acknowledgment for development assistance and its potential for inviting bicyclists and the resulting economic benefit from State advertising of the Route.

There is also the possibility of establishing an alternative spur route from the High Point to Cape May spine into Cumberland County direct from Atlantic County along Cumberland County route 552 and continuing to Cape May via County Route 347 and state highway 47. Neither of these routes were mapped specifically for this study. However, the roads that have been evaluated can be used to help identify a suitable High Point spur route or loop. This effort would necessarily have to be coordinated with Cape May County. Cape May County has pursued and implemented a number of bicycle facility projects. It may be presumed that coordination with Cape May on bicycle projects would be fruitful.

## **B. Separate Trails**

### **1. Rail Trail Opportunities**

Abandoned Railroad corridors are most often very attractive and favorable for use as bike trails or multi-use recreational facilities. Once developed, they are almost universally very popular with bicyclists, inline skaters (on paved surfaces only) and many passive recreational activities. Because of their popularity, property owners may be wary of having such a facility be developed near their homes or businesses. Experience has shown, however, that in all parts of the country recreational rail trail facilities most often prove to be beneficial to nearby property values. Just as easy access to roadways, highways, sidewalks, transit, parks and schools increases the value of property, a rail trail facility provides a safe and attractive recreational facility for local residents to use. Numerous business successes (ice cream, deli's, etc.) throughout the country owe a dramatic increase in sales to rail trail user patronage.

It is the policy of Cumberland County and the Planning Department to work with adjacent owners to obtain their support and/or agreement before any active planning or development of any abandoned rail corridor would begin.

Cumberland County has several abandoned Rail corridors that are under various ownerships. Other former railroad ROW's have been purchased by or reverted to adjacent property owners. The following is a review of identified abandoned rail corridors. Information was supplied by the County Planning Department based on examination of Tax Maps and land ownership records. It should be noted that the ownership of rail corridors is a dynamic process since there are usually many adjacent owners involved and many different types of deed conditions from owner to owner. Any rail corridors that may be viewed as possible candidates for recreational/non-motorized transportation development would require a detailed analysis (deed searches) on each parcel in order to positively identify ownership and ownership conditions. Abandoned rail corridors that are



comprised of few contiguously owned parcels may be more attractive from an acquisition perspective, having fewer owners with which to negotiate. Corridors involving numerous fragmented parcels under different ownerships may be expected to take years of work to obtain either ownership or deeded right of entry for the rail trail facility and users. In these case(s), the facility should be particularly attractive and/or useful as a rail trail facility by providing a pleasant experience away from traffic or fulfill a particular travel need connecting desirable destinations. Portions of some corridors were investigated in the field and are described below.

Primary identification of abandoned rail corridors was obtained from bibliography reference **III, 9**. New Jersey Conservation Foundation, *New Jersey Rails to Trails – Linear Recreation for Abandoned Railroad Rights-of-Way*, 1980. The following numbering system is from that study.

50. Formerly abandoned Seabrook Farms Branch of the Central Railroad of NJ north of Bridgeton has reverted to adjacent property owners north of Parsonage Road, Seabrook. South of Parsonage Road it has been placed back into service by the Winchester & Western RR.

51, 52. Central RR of NJ Vineland Branch in Hopewell Township – Parts have been sold to adjacent property owners and parts are still in tact. Within the City of Bridgeton, the ROW is owned by the City. This corridor should be examined for viability as a trail facility to serve northeast Bridgeton.

55. Central RR of NJ Maurice River Branch – Commercial Township. The approximately 3 mile long corridor is owned principally by Commercial Township from Warren Street/Yock Wock Road, Port Norris to near Dividing Creek-Mauricetown Road (CR 676). At CR 676 it appears to be in private ownership (See photographs). It intersects Parsons Lane approximately ½ mile from Yock Wock Road and crosses James Moore Road (CR 614) 2 miles from Port Norris (see Photographs). The utility of developing this facility would be based mostly on local interest. Its Port Norris terminus would suggest a fair amount of use by local residents. By not having another destination at the other end reduces the utility of the investment as a transportation element. However, as a recreational facility, it may be an attractive local asset. A natural material (non-paved) surface could reduce the cost of improvement and yield an attractive facility. Care should be taken to locate and erect barriers that would positively exclude motorized vehicles, particularly motor bikes.

56. Pennsylvania-Reading Seashore Line Maurice River Branch – Maurice River Township. Most all of the former ROW is currently used by streets or roadways through Leesburg and Dorchester. The southern section beginning at Matts Landing forms a dike which passes northward through characteristically pleasant salt marsh. The northern section from Dorchester to Port Elizabeth has many attractive features (marshland, stream crossings) but crosses two major roads, namely CR 670 and State highway 47, both of which have traffic volumes of between 5,000 and 10,000 vehicles per day. Trail user actuated signalized crossings would be advisable in these locations should development be pursued. The wooden bridge abutments crossing the Muskee Creek would require significant repair or replacement.



57. Pennsylvania-Reading Seashore Line – Millville Branch, West Jersey & Seashore Railroad Company. This Abandoned rail corridor carries the greatest promise for near-term development as a recreational facility in the County. The majority of the abandoned portion of the corridor has been purchased by the State of New Jersey from Approximately Weatherby Road in Cumberland County through Belleplain State Forest to Woodbine in Cape May County. Several remaining small parcels are actively being pursued for purchase/right of access by NJDEP.

Plans are underway to develop the entire corridor south to Cape May Courthouse. The significance of this corridor to Cumberland County is not so much that developed as a facility it would provide access to the shore attractions, but rather, that it would provide a short (by bicycling standards) 15 mile trip to less crowded, quieter and slower-paced attractions and camping in the Mauricetown area and a little further distance to Millville.

North of Weatherby Road, approximately 0.75 mile is owned fee simple by the State of New Jersey and managed by the Division of Fish, Game and Wildlife. The corridor terminates in the WHIBCO sand & gravel Port Elizabeth Plant. South of Weatherby Road, the corridor is managed by the Division of Parks and Forestry State Park Service. A map produced by the Department entitled *Belleplain State Forest Trail Map*, identifies the section between Weatherby Road and Hunters Mill Road as open to non-motorized use only. From Hunters Mill Road to Woodbine, the trail is open to “street-legal” motor vehicles and non-motorized use.

The current condition of the entire corridor within Cumberland County is unimproved. Track rail has been removed, however much of the former rail bed is significantly overgrown with trees and contains many old track ties. The corridor is generally accessible via narrow trails along side of the rail bed or on the rail bed for short sections (See photographs in the Appendix). In some cases, the trail may be located outside of the ROW boundary.

Both sections of the Seashore Line Trail corridor in Cumberland County (North and South of Hunters Mill Road) is heavily used by motorized vehicles. As mentioned, motorized vehicle use is illegal north of Hunters Mill Road. It was reported by both Fish and Game personnel and Parks and Forestry personnel that off-road motor vehicle activity in the area of Weatherby Road is significant. Sand and gravel pits provide an irresistible attraction to both street legal as well as illegal ATV’s (all terrain vehicles). This was observed in the field as evidenced by numerous paths entering from the roadway over barrier soil piles. Parks personnel estimate that hundreds of off-road motor enthusiasts congregate in the area on weekends during summer months. Two fatalities due to ATV use in the private sand and gravel pits have been reported in recent months. Enforcement efforts are ongoing in order to provide some control over this illegal invasion of motorized recreation.

Improvement of the rail bed into a smooth trail (either paved or surfaced with a natural aggregate material) may serve to make the trail less appealing to motorized vehicle users who seek the challenge of navigating obstacles on more “natural” wooded trails. Trail improvement would also open access to enforcement vehicles and personnel.



A crushed stone Parking area is planned for the Trailhead /intersection at Weatherby Road according to the Division of Parks and Forestry.

53. Pennsylvania-Reading Seashore Line – Newfield Branch. Although this abandoned rail corridor does not enter into Cumberland County, its proximity to Vineland makes it a corridor of significant interest. According to the Atlantic City Press (May 13, 2000), the first 7.8 miles from Egg Harbor Township to Mays Landing proposes to have several sections completed by the spring of 2001. The overall plan is to complete a 23-mile cross-Atlantic County trail to Buena Vista Township. This would put the facility within approximately 4 miles of the Cumberland County/Vineland border, following CR 540 to Richland, Atlantic County.

Cumberland County should consider improving CR 540 (most of it currently does not meet bicycle compatible guidelines) and working with Atlantic County to complete bicycle compatible improvements in order to link the rail corridor with Vineland via CR 540.

Of special note is the Pennsylvania-Reading Seashore Line Bridgeton Secondary branch from Bridgeton to Glassboro. This corridor would be a valuable link to a potential extensive network reaching Gloucester, eastern Camden Burlington and Ocean Counties.<sup>8</sup> Only a small portion of this corridor has been improved in Glassboro and little, if any, has been developed in other counties. In Gloucester County, the corridor encounters an interruption with Route 55 reportedly requiring an overpass. Even with a major interruption at the Route 55 crossing, conversion of the right-of-way to a trail is recommended.<sup>9</sup> The great potential as a bicycle transportation corridor and a valuable recreation facility evident in this corridor warrants further investigation and community support by Cumberland County and surrounding communities.

## **2. Other Separate Trail Opportunities**

### **a. Wildlife Management Areas**

In addition to abandoned railroad corridors, trail opportunities separated from traffic exist on public lands in Cumberland County. The NJDEP Division of Fish and Wildlife manages several Wildlife Management Areas (WMA's), in Cumberland County. The Union Lake, Peaslee and Edward G. Bevan WMA's are among those that are located inland and are subject to consideration for separate trail development.

WMA Management in Cumberland County is open to consideration of limited recreational trail construction on WMA's. The WMA's have a number of existing sand / dirt roads that might form the basis of a few trails that could provide links to roadways or other trails. The Division is not open

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<sup>8</sup> Delaware Regional Planning Commission, *Abandoned Railroad Inventory and Policy Plan, Final Report*, September, 1977

<sup>9</sup> NJ Department of Environmental Protection, Division of Parks and Forestry, Office of Lands Management, *New Jersey Trails Plan*, January 1996



to creation of new trails over long sections of forest, nor is it open to allowing significant portions of their dirt roads to be paved.

One example of a possible new paved trail open for consideration would be an interconnection between Hesstown Road (CR 644) and Cannon Range Road off of CR 522. This interconnection would utilize a portion of a network of existing dirt roads and construction of a new short section of trail/road.

Precedent does exist for bicycle and pedestrian trails sponsored by counties and municipalities where all or a portion of the ROW passes through State game lands.

The Division would consider such construction and public access under a number of conditions:

1. Coordination with State Officials -- Early communication with state officials at the supervisory level (for the management unit) *in addition to* discussions with officials responsible for system-wide management and policy (the Trenton office).
2. Memoranda of Understanding -- Generally, State officials recommend that the planned trail be memorialized through a Memorandum of Understanding that details management, maintenance and construction obligations, signage, trailhead access etc. The MOU may include maps of preferred ROW, construction documents and environmental permitting.
3. Liability – At this time the State does not require local trail sponsors to accept liability for damages that occur to State property (real, personal), or for tort claims entered against the State of New Jersey while using trails across State game lands. Moreover, local governments are not required to indemnify the State against any claims filed for damages or tortuous activities. Of course, this does not preclude the possibility that a local government sponsor would be named (and would have to defend itself) against such a lawsuit in the future. Rather, the State has not placed conditions governing the liability of local sponsors who co-locate a trail.
4. Operation and Maintenance Expenses – The cost and maintenance of trail improvements should be borne 100% by the local trail sponsor. The Division of Fish and Wildlife does not have a budget allocation for trail development, maintenance or enforcement. All trails should be maintained and enforced (as necessary) by the local trail sponsor(s).
6. Hunting Activities – Most State WMAs are open to hunting during part of the year and this accommodation is unlikely to change in the event of a planned recreational use trail. With respect to conflicts of use occasioned by hunting, the State holds the position: “User Be On Notice, User Beware, and User Travel at Your Own Risk.”
7. Construction of any paved pathways would be required to accommodate Division vehicles for fire protection, maintenance and patrolling. Ten ft. wide would be a suggested minimum width.
8. Appropriate secure barriers might be erected to exclude prohibited vehicle access yet allow authorized access. However, this practice is subject to consideration. Instead of assuming the



need for barriers at the outset of construction, they should be used only after all other efforts have been tried in the face of an actual problem of undesirable or unauthorized access.

First, barriers should be used only when a real need is demonstrated. Second, enforcement efforts should be fully utilized before physical barriers are installed.

Even when barriers are used, they are often vandalized and laid to waste after the expense of purchase and installation is realized. People who are intent on gaining illegal access to a trail may create an additional access route circumventing the barrier, even if the barrier has substantial fencing extending well beyond the barrier to the ROW line.

### **b. Utility Corridors**

Gas line and electric utility ROW's sometimes present favorable options for separate recreational trails. Typically however, these corridors exist through easements associated with numerous different property owners and varying agreement nuances. Occasionally, a utility ROW will be owned fee simple. In this case, if the corridor represents a location that is desirable from a bicycle transportation perspective – such as linking a major business, industrial or commercial center with residential center – then it may be desirable to pursue negotiations with the utility company for the purpose of establishing a recreational/bicycle trail facility in that corridor.

Precedent has been established for public access trail facilities in utility corridors in New Jersey. Most notably, Atlantic City Electric (ACE) is currently working with Atlantic County to establish a bike trail in a fee simple owned ROW. The power line corridor mapping provided by ACE / Conectiv in response to inquiry for this Cumberland County Bike Trail Study included only the higher voltage *transmission* lines. Additional consideration and effort could be pursued to examine mapping of the more local power *distribution* system corridors. These corridors may provide additional opportunities for recreational trails.

### **C. Cumberland County Bicycle Circulation – Suggested County Bike Routes**

A mapping layer entitled *Suggested Bike Routes* was prepared for this Study, a copy of which is included in the back of this Report. The roadways selected for these routes are primarily those roads that were identified as bicycle compatible (see I. Roadways, above) with some non-bicycle compatible segments selected in order to complete route interconnections (CR 610 into Cedar Lake is one example). State highways were also included in the Bike Route system. Route selection criteria necessarily must consider bicycle transportation between residential, commercial and retail planning zones. Certified Economic Empowerment Zones shown on the Study maps include these zones residential and business zone areas. Proposed bicycle routes provide either direct access, or pass close to these zones, thereby enhancing and encouraging potential bicycle travel between these zones.

The Route selection criteria also sought to provide ample interconnections between Bridgeton, Millville and Vineland, as well as access routes leading into Cumberland County. County Routes 553, 555 and 610 are less bicycle transportation oriented and oriented more bicycle touring/ecotourism/club rides owing to their more remote location within the County, yet providing



necessary bicycle route connectivity between the smaller towns of Fairton, Cedarville, Newport, Dividing Creek, Port Norris, Port Elizabeth, Dorchester, Leesburg and others.

As cited above, the level of detail required in evaluating bike routes within the county's three cities, as well as such a level of detail as identifying every spot constraint on County roadways is beyond the scope of this Study. Prior to implementing any of the Suggested Bike Routes, each road should be inventoried for spot hazards and constraints, including intersections. The hazards should either be corrected or otherwise mitigated with warnings (signing, striping, etc.) through careful design on a case-by-case basis. Some corrective measures are mentioned along with a picture of the hazard in Appendix V. Photographs. It should be noted that admirably, Cumberland County is relatively free of bicycle-sensitive hazards. Based on an informal estimation from the field reconnaissance performed for this study, railroad crossings account for the largest number of bicycle constraints.

Various corrective / enhancing measures have been identified and summarized in the NJDOT Conceptual Development Reports – Route 49 Bicycle and Pedestrian Compatibility Analyses (see footnotes 4 through 7 above) and NJDOT Memoranda regarding Routes 47 and 55 (footnotes 2,3 above). While those reports are specific to the referenced highways and locations, many of the bicycle compatible mitigating recommendations can be applied in many other locations. A number of mitigating techniques are summarized as follows:

- Restripe road markings to provide narrower vehicle lanes and wider shoulders
- Provide bike lane striping or “hybrid” lane stenciling as may be appropriate
- Restripe intersections to accommodate and guide bicycle traffic
- Remove railroad tracks where facility has been abandoned
- Pave over railroad tracks where facility is abandoned or out of service
- Provide compressible flangeway fillers at railroad crossings
- Pave driveways to the edge of the right of way line to reduce gravel scatter on road/shoulder
- Replace hazardous drainage inlet grates with bicycle safe grates
- Raise manhole and/or drainage inlet castings to become flush with finished pavement surface
- Provide hazard markings as interim mitigation
- Install “Share the Road” signs
- Increase periodic mechanical sweeping of roadways or shoulders in areas where gravel and debris collects as a result of storm runoff.

Many other sources that contain bicycle compatible design recommendations and techniques are listed in the Bibliography of this report.

#### **D. Transit Access**

Access to transit for bicyclists expands the distance that might not otherwise be coverable strictly by bike. The transit system also benefits from providing access for bicyclists (and their bicycles) by increasing the capture corridor beyond that of pedestrians.

Appendix VII. provides a table of NJ Transit Bus to Cumberland County. NJ Transit should be contacted for up-to-date information on schedules once a traveler's origin and destination is established.



### III - Trail Use Considerations

Use of recreational trails separated from traffic should be determined by community consensus. Recreational “trails” are typically used by the population that lives within a short distance (½ mile or so) of the trail. Therefore, the local community should determine the types of uses the trail should accommodate and the trails should then be planned and designed to maximize the suitability of desired users and minimize user conflicts. Cumberland County policy would exclude and motorized use, including snowmobiles, from County-owned facilities.

The types of desired/permitted uses would determine what kind of surface material that the trail should be constructed of. Paved surfaces are not suitable for equestrian use. Natural materials (sand/stone aggregate) are not well suited for narrow tire road bikes nor are they conducive for inline skating. Knowing this, surface materials can also be used to attract or discourage certain types of uses.

Seasonal uses should also be considered for trails. Cross-country skiing is often a popular wintertime activity on non-motorized accessible trails. Should the trail is deemed a transportation (commuter) route, snow removal may be desirable so as to keep the facility passable throughout the winter.

Trail user etiquette typically adheres to the following “yield rules”: Cyclists yield to pedestrians and both yield to equestrians. The faster users typically yield to slower ones. The following sign is nearly universal on multi-use trails where all identified users may be present to help control right-of-way:



The following trail use regulations should also be considered<sup>1</sup>:

- Stay to the right except when passing
- Travel at a reasonable speed in a consistent and predictable manner
- Always look ahead and behind before passing
- Pass slower traffic on their left; yield to oncoming traffic when passing
- Give a clear warning signal before passing
- Keep all pets on a short leash
- As a courtesy to trail neighbors, refrain from loitering near adjacent homes
- Move off the trail when stopped to allow others to pass
- Yield to other users when entering and crossing the trail
- Alcoholic beverages and illegal drugs are not permitted on the trail
- Firearms, fireworks and fires are not permitted on the trail – Though as noted in another section of this Study, Wildlife Management Areas purposefully would allow hunting on lands surrounding the trail, and users should therefore be aware of this during certain seasons.
- All trail users should use a light and reflectors after dusk and before dawn. Alternatively, trails might be closed during specific times, such as from midnight to 6:00 a.m.

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<sup>1</sup> Ryan, Karen Lee, Rails-to-Trails Conservancy, *Trails for the Twenty-First Century, Planning, Design, and Management Manual for Multi-Use Trails*, Island Press, Washington DC, 1993



## IV - Bicycling Tourism and Ecotourism

### A. Bicycle Tourists

Advancing bicycling tourism, as with any promotional campaign requires that the advertiser knows something about the audience they are trying to attract. The following information, concepts, opinion and suggestions provide insights and impetus that can be translated into successful organizational and outreach efforts to attract bicycle touring to Cumberland County.

A recent survey by Adventure Cycling Association (ACA)<sup>1</sup> yielded the following revealing facts:

- ❖ Out of 440 respondents, 57% were NOT an active member of a local cycling club.
- ❖ Out of 438 respondents, 82% were male.
- ❖ Out of 436 respondents, The following % of indicated age distribution was documented:

<u>Age Range</u>	<u>% of Respondents</u>
20-29	2.29
30-39	12.39
40-49	33.03
50-59	35.09
60-69	14.22
70-79	1.38
80-89	0.23
No answer	1.38

This information could be interpreted in a number of ways, though only time will tell as to the factuality of the following trend:

- Middle-aged men (ages 40-60) and presumably financially established, are the largest sector of the population that seek out long distance bicycle tours (of the type that ACA promotes) in the US.
- Whether this is indicative of the specific group who grew up bicycling as youths and as young adults and will reduce the amount of bicycling as they age, or whether it is an overall demographic core group that will remain more or less constant over time, remains to be seen.

Numerous competing factors in a changing society stand to either raise awareness and popularity of bicycling and bicycle touring, or cause interest in cycling to wane. Factors in favor of increasing cycling's popularity however, include efforts to improve conditions for cycling within the transportation/roadway network, as evidenced in numerous bicycle facility improvements throughout the Country and as supported through this Cumberland County Study and anticipated infrastructure improvements.

Individual touring cyclists are notably an independent lot. They are usually looking to “get away” from the regular grind of today's typical hectic life. Whether as part of their daily routine or as a vacation choice, they desire a slower pace to part of their lives and incorporate bicycle travel as one means to achieve that end. In addition to be “an independent lot”, bicyclists can also be frugal. But

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<sup>1</sup> Adventure Cycling Association, PO Box 8308, Missoula MT, 59807-8308. From web site: [www.adventurecycling.org](http://www.adventurecycling.org)



as ACA's demographic profile survey indicates, the greatest population of bicyclists are of the age where they are likely to be financially established, have families and disposable income for bicycles and bicycling vacations. Attracting bicycle tourists to Cumberland County must include facilities and amenities that accommodate a diverse sector of cyclists from the frugal-minded individuals to families, to larger tour groups, to organized events.

## **B. Types of Cycling and Cyclists**

Cyclists are commonly classified according to experience as "A", "B", or "C" type riders. "A" riders are defined as more experienced, likely to be an active club rider or a regular bicycle commuter. These riders ride at faster speeds and have little difficulty with riding in traffic with no special bicycle lanes or signs. "C" riders are defined as Children or Casual adult cyclists who ride infrequently and feel more comfortable in bike lanes or on recreational / bicycle facilities separate from traffic. There is some inconsistency however, in making these distinctions when planning and designing a bicycle circulation network. It is instead preferred that any bicycle enhancing improvements be made to the best possible standard and criteria allowable under the particular conditions. All facilities should safely accommodate as many types of cyclists as possible. Separate facilities should be designed to accommodate higher speed cycling and bike lanes should be sufficiently wide and continuously defined so as to properly guide less experienced cyclists as well as to warn motorists.

For the purpose of this Study section on Bicycle Tourism and Ecotourism, we define several types of cyclists, cycling venues and cycling events that could be targeted by Cumberland County to attract through ecotourism initiatives. These factors are also helpful to keep in mind while instituting the Bike Trail Study / bicycle circulation plan. Types of cyclists and events are as follows:

1. **Commuter Cyclists** – Although not a tourism mode, it is essential that planning for bicycle transportation recognize bicycle commuting. Bicycle commuting involves one or possibly two cyclists that would commute between their home and a fixed location of employment, school or college. Bicycle commuters habitually use the same route just as automobile commuters do. Unless they desire to extend a commute distance for the purpose of gaining more exercise or if there is a particularly traffic-congested area with difficult cycling conditions (no shoulders or lane sharing space), bicycle commuters will take the shortest distance between their origin and destination.

Typical commuting cyclists are either professionals who integrate exercise with a commute to work, or low-income workers (and students) who bicycle in order to minimize their expenses. Bicycle commuting distances range from walking distance (but is cycled in order to cut time) to about ten (10) miles or longer.

2. **Solo cyclists** – Local or regional cyclist who may regularly commute by bicycle or who would ride for recreational purposes, distances of 25 to 100 miles or more in length. The recreational rides they would follow are circuitous routes starting and ending at the same point, therefore the rides may be located entirely within or easily pass in and/or out of Cumberland County.



3. **Touring/Camping Cyclists** – Long distance cyclists who typically would plan out a trip of several days, weeks or months in duration. The types of rides would typically be of a length that would take the cyclists through the County, but where they would stop to rest, eat, drink, or possibly over night depending upon the situation or itinerary.
4. **Group Touring** – Numerous companies (commercial and non-profit) throughout the US organize bicycle vacation tours within the USA and abroad. Among the most well know are Vermont Bicycle Tours and the Adventure Cycling Association (ACA, formerly Bikecentennial). Tours may incorporate any mix of camping, motels, catered (on the road by the tour group) meals or “find your own food” while suggesting food stop locations and sources.

ACA currently distributes a series of bike route maps, several of which cover an East Coast route. The New Jersey leg of this route is included on the map named *Windsor Locks, Connecticut to Norristown, Pennsylvania (345 miles)*. This route currently enters New Jersey at Port Jervis at the New York/New Jersey border. The route parallels the Delaware River to Lambertville, near Trenton. The main route continues west from Lambertville into Norristown, PA.

As New Jersey DOT, Counties and municipalities embrace bicycling and bicycle routes as part of their transportation planning and infrastructure, an opportunity for a published Adventure Cycling Association route into Cumberland County may present itself. Two such future routes might include an alternate/spurt route from the NJDOT High Point to Cape May bicycle touring route (mentioned elsewhere herein) and a Route through Cumberland County to Fort Mott, Delaware.

4. **Club Day Rides** – Scheduled local bicycle club rides open to members and non-members, of varying lengths, distances and terrains (hilly or flat). Most rides are on the weekends, although regular summer evening rides are popular after work and a regularly scheduled midday ride may be popular with retirees. Some larger companies have employee organized bicycle clubs or more loosely convened general-invitation lunchtime or after work rides.
5. **Bicycle Touring Events** – Local Bicycle Clubs often host fundraising events in the form of one-day invitational gatherings. Some events focus around a single route while most provide a selection of routes of varying distances and terrain to choose from. Examples of these in New Jersey include the Princeton Freewheelers’ Princeton Bicycling Event, Central Jersey Bicycle Club’s Raritan Valley Roundup, Hillier than Thou, The Longest Day (High Point to Cape May – over 200 miles in one day), Wheels 4 Anne charity ride, and The Western Jersey Wheelmen’s West Jersey Double (200 miles in one day). These events are organized similarly to the League of American Bicyclists GEAR events (see below), but without the need for lodging. These events can receive attendance of between 50 to 1,500, depending on the ride(s).



6. **Bicycle Tour Fundraising Events** - Bicycle touring events have become enormously popular for charity fundraising over the past decade. Charity and other fundraising events may draw a wider population of bicyclists beyond club members merely because of the charity involved, because there is no assumed competition involved (as is not the case with some club rides), or because there is no further commitment to the organization or event once the event ride is completed. Local bicycle clubs paved the way for these events and often provide assistance in laying out routes for the event as a sponsor. However, in many cases charity organizations have become independent in their ability to put on complete bike tours, often using the same or mixtures of routes publicized by local bike clubs. Charity events can draw over 1,000 cyclists for a one-day event.
  
7. **Bicycle Touring Events** over several days – The League of American Bicyclists (formerly the League of American Wheelmen) annually promotes a number of large-scale summertime bicycle touring events. Traditionally begun on the east coast, the Great Eastern American Rally (GEAR) events have multiplied in recent years, where two events are currently held in the East (GEAR North and GEAR South). A GEAR West has also been held over the past few years. These events are held through a coordinated effort between a local bicycle club and the League. The League provides many support services that can be performed remotely from their offices in Washington DC (advertising, printing, mailing, preparation of maps and cue sheets, negotiating food and lodging accommodations, etc.). The local bicycle club initially seeks a suitable location to hold the event (typically a college campus) and, being intimately familiar with the best roads in the region for bicycling, identifies a number of routes of varying length and terrains and marks each route with small paint markings on the roadways. (In response to one municipal objection to such “defacing” public property during preparation for GEAR in central NJ, the NJDOT through the Bicycle and Pedestrian Advocates office, sanctioned this practice as being inconsequential as to defacement of public roadways (not unlike surveyor’s paint markings) and small enough so as to not be recognizable by or cause confusion to motorists). These touring events can typically draw over 1,000 cyclists over a long weekend.
  
8. **Bicycle Racing**

*“Since the creation of the modern bicycle, the United States has been a dominant force in cycling competition. Before World War II, cycling was second only to baseball as a national sporting pastime. Following a period of decline in the 1950s and '60s, cycling regained its popularity and today is the fastest-growing amateur participation and spectator sport. Studies show that more than 99 million Americans are active in cycling. Research further indicates that these people spend more than \$1 billion annually to participate in the sport of cycling, and that these expenditures will likely double over the next several years.”*<sup>2</sup>

Bicycle racing events stand apart from bicycle touring in their broader organizational structure. **USA Cycling** is the umbrella organization for amateur and professional bicycle

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<sup>2</sup> USA Cycling web page. [www.usacycling.org/corp](http://www.usacycling.org/corp)



racing in the US, made up of the *National Bicycle League (NBL)*, the *United States Cycling Federation (USCF)*, the *National Off Road Bicycling Association (NORBA)* and the *U.S. Professional Racing Organization (USPRO)*.

Bicycle racing clubs and representatives in central and southern New Jersey include:

Somerset Wheelmen – Joe Saling – 908-725-3164

Team Reaction – Steve Schneider – 908-683-4488

Jager Wheelmen Club – 609-882-7956

Jersey Off Road Bicycle Association (JORBA) – Sarah Frost – Bike24b@aol.com

These organizations or the local representatives could be contacted in order to explore opportunities to bring both on-road and off road bicycle racing events to Cumberland County.

## 9. Other Organizations

- **National Audubon Society** – According to Pete Dune, Director of the Cape May Bird Observatory (609-861-0700), the NJ Chapter of the National Audubon Society hosts a bicycling contingent of birding enthusiasts who assist in the annual World Series of Briding. They find that by bicycling they are more observant and aware of bird locations and the presence of birds, less intrusive on feeding and nesting birds (they are less likely to frighten birds), and they get good exercise not available if they would be driving in a car.
- **The Wayfarers**, Lambertville, NJ – Bicycle tour organizer.
- **League of American Bicyclists** – Best Biking in America listing in their Annual Almanac. Where affiliated organizations promote events in their area. The League has 35,000 individual members, 455 member Clubs and 50 advocacy organizations affiliated with its activities. Affiliated clubs local to Cumberland County area could reach hundreds or thousands of cyclists for any given event. 202-822-1333, [bikeleague@bikeleague.org](mailto:bikeleague@bikeleague.org)
- **South Jersey Wheelmen** – This bicycle club is local to Cumberland County, based in Vineland. Like most bicycle clubs, the members are enthusiastic about their sport and eager to promote it, especially if it results in better bicycling accommodations in their area. The South Jersey Wheelmen are likely to be willing and eager participants in any initiatives to advance bicycling in Cumberland County, whether it be for touring enthusiasts or for increasing the use of bicycles for local transportation by casual cyclists. The SJW club should be consulted early in the process of any bicycle program planning to ensure that the program appropriately fulfills bicyclist's needs. P.O. Box 2705, Vineland, NJ 08360-2705, Phone: (609)-848-6123

## C. What do Touring Bicyclists look for in Places to Ride?

What attracts bicycle tourists to a given area? The following is a listing of features and ideas that could assist Cumberland County in developing a bicycling tourism plan strategy. They are not necessarily in order of importance.



- ✓ **Bicycle Route Mapping** – Bicyclists seek out several sources of published bike routes to suite their physical abilities, interests and time availability. Included in this Study are plotted routes obtained from several published sources which are referenced in the Appendix. Marketing these and other routes and the attractions/sites that they pass is one way to attract bicyclists to the area.
- ✓ **Good Roads** – The promise (and photographs) of smooth, clean roads (or preferably shoulders / bike lanes) is a benefit to an enjoyable cycling experience. Cumberland County’s roads are typically in very good to excellent condition.
- ✓ **Low Traffic** – Coupled with goods roads, and perhaps more attractive to bicyclists, is a day’s cycling along quiet roads with few cars. Roads without shoulders (that technically are non-bicycle compatible) but with minimal motor vehicle traffic are of the most attractive and sought after for bicycle touring.
- ✓ **Food** – Food is the fuel that makes bicycle engines run. When a bicyclist runs out of food, it can be a scary and even dangerous situation. “Driving” to the nearest food store or restaurant means expending more food fuel. If the distance is long enough, it may be difficult to travel that distance without serious fatigue. Good food means good fuel, means better, more enjoyable bicycling. A forced diet of “*twinkies*” or even a constant diet of hamburgers will not bode well for attracting bicyclists. Restaurant, B&B, Deli owners and the like should be an enthusiastic source of promotions and ideas that would help invite bicyclists to their doors and provide Cumberland County with tourism services.
- ✓ **Clear Directions / signs** – Clear, easily understandable maps, cue sheets (turn-by-turn directions) and informational road signs (route numbers, destinations, mileage) are important to finding one’s way in unfamiliar territory. Cumberland County’s roadway network is well marked. Specific bicycle route signs with destinations and mileages would be an attractive amenity.
- ✓ **Bicycle Signage** - Signing road shoulders as bike routes or bike lanes, or providing “Share the Road” signs on non-bicycle compatible roads would be an inviting attraction to bicyclists. Such signs would help make cyclists feel welcome on the roadways – that they belong, instead of being an intrusion to the thinking of the motoring public.
- ✓ **Sights, vistas** – A showcased natural environment is often a feature that cyclists will consider in selecting their tour route. Cumberland County’s expanses of tidal marshes, pristine rivers and pineland forests make attractive bicycling destinations. Additional amenities and services could enhance the experience and attraction to natural areas, such as canoe rentals, wildlife observation blinds, picnic areas, interpretive information kiosks and the like.
- ✓ **Attractions** – “Off the beaten path” low-key attractions are in keeping with cyclists’ yearning to get away from the crowds. Cumberland County has numerous historical and interesting sites and attractions
- ✓ **Good Food** – Bicycle touring (whether solo, club rides or vacation tours) can easily fail or succeed based on the food that is available, and food is usually the first topic of discussion when evaluating or reminiscing about a memorable bike tour. In many cases, the primary destination of a local bike club ride will be a good quality restaurant or dessert shop.
- ✓ **Lodging / camping facilities** – Depending upon the financial situation of the cyclist and/or the type of touring S/he has set out to experience, they may seek either economical tent camping facilities (public or private) or almost any price range of motel or hotel accommodations. Over a period of days and depending upon weather conditions, a



combination of the two is often utilized - where a day of rest, escape from rain, to clean up and dry out is the choice made.

- ✓ **More Food, ice cream** – Need we say more?

#### **D. Cumberland County Ecotourism Plan**

Bicycles and Bicycling are universal symbols for healthful living, caring for the environment, leisure activity, freedom and youth. Because of this universal appeal, bicycles are often used in commercials for all sorts of goods and services. They get your attention. They appeal to everyone. In order to increase appeal of an inherent polluting technology, many automobile manufacturers use bicycles in their advertisements and some manufacturers even give away a bicycle with the purchase of a car. Cumberland County should capitalize on this same universal appeal of bicycles and bicycling.

The County Ecotourism Plan contains a plethora of useful ideas and strategies for increasing Ecotourism in Cumberland County. As the Ecotourism Plan stresses, partnerships with business and organizations are a major key to success.

One of the six Themes of the Cumberland County Ecotourism Plan is *Birding, Biking, and Hiking: Passive Recreation*. The foregoing discussion expands upon the biking portion of this Ecotourism theme and provides specific information that will help in the planning to draw bicyclists to Cumberland County.

The County Ecotourism Plan identifies more than 90 ideas that can move its ecotourism program forward. When planning and designing bicycle facilities and programs, many, many of these creative and cogent strategies would apply to bicycle tourism. Reading through the Plan's lists of ideas with bicycle touring in mind, one can recognize many opportunities for including bicycling into those ideas and strategies. All levels of government, local business and non-profit organizations can benefit from the appeal of bicycles.

To pursue implementation/integration of bicycles and bicycling into ecotourism strategies, a separate bicycling subcommittee of an ecotourism advisory committee might be in order, or at least the advisory committee should seek the input of the bicycling community into ecotourism efforts. The bicycling community could be expected to enthusiastically support any efforts to improve cycling in the County and the region. After all, what would benefit bicycling for ecotourism would benefit bicycling on a local level.

To expand on the Ecotourism Plan's ideas and strategies, particular actions that may be considered are as follows:

- Expand regional advertising about the great bicycling and new bicycle network in Cumberland County (once the network is implemented). That is, provide brochures in targeted locations of popular shore communities and other popular locations and population centers:
  - Bike Shops
  - Motels, hotels, B&B's
  - Tourism centers



- Identify on maps in the brochures, attractive bike routes from those shore communities to Cumberland County. Millville is a likely major destination closest to Cape May County.
- Advertise Bicycling in Cumberland County through:
  - Bicycling clubs, organizations and their magazines
  - Other outdoor activity organizations/clubs and publications:
    - Canoeing
    - Kayaking
    - Hiking
    - Birding (as mentioned elsewhere herein)
- Development of the West Jersey & Seashore Railroad Company abandoned ROW through Belleplain State Forest from Cape May Courthouse would be a significant attractor for bicycling from shore vacation communities. It is approximately 30 miles distance from Cape May Courthouse to Millville. Belleplain State Forest is located half way and has the finest of camping facilities.
- Promote those bicycle tour books that include the routes identified on the *Published Routes* map in this report.
- Include basic bicycle driver and safety tips in brochures.
- Promote the Coastal Heritage Trail – Delsea Region. A Heritage Trail bicycle touring route has already been identified with help of the local bicycling community. This Route is identified at route No. 10 on the *published routes* mapping as part of this Study.

The Ecotourism Plan states that there are very few trails where biking can occur in a well managed and safe environment. But as this Study indicates, many of Cumberland County's roads are very attractive and suitable for bicycling, although it is recognized that separate trails are most popular with the greater population of cyclists – the casual cyclists. Opportunities for separate trails have been explored elsewhere in this Study. As in the Ecotourism Plan, this Study also recognized that there should be improvements made toward managed State Parks facilities in Cumberland County. In particular, the West Jersey & Seashore Line abandoned Railroad ROW through Belleplain State Forest.



## V – Funding Sources

**Appendix VI** of this report contains a compendium of funding sources for bicycle and pedestrian planning, programs and projects. It cites funding opportunities from most, if not all levels of government and bureaus. It was assembled by the NJDOT Bicycle and Pedestrian Advocate, William Feldman, who's office may be contacted for clarification or further information on the compilation.

The NJ Bicycle and Pedestrian Advocates office may be contacted at:  
New Jersey Department of Transportation  
Bureau of Mobility Strategies  
1035 Parkway Avenue  
P.O. Box 600  
Trenton, NJ 08625-0600

Tel. 609-530-8062 or 4284  
Fax. 609-530-3841

The NJDOT WWWeb site also has much information regarding bicycle and pedestrian issues, though not specifically funding opportunities:  
[www.state.nj.us/transportation/](http://www.state.nj.us/transportation/)

**The South Jersey Transportation Planning Organization** funded this Cumberland County Bike Trail Study. The SJTPO is perhaps the best source for funding since it provides the most direct conduit to Federal TEA-21 (Transportation Efficiency Act, 21<sup>st</sup> Century) / Federal Highway Administration (FHWA) funds. The SJTPO is also concerned with transportation issues only in a four-county region that includes Cumberland County. This would provide Cumberland County less competition for funding dollars allocated through SJTPO.

South Jersey Transportation Planning Organization  
1173 E. Landis Avenue  
Vineland, NJ 08360

Tel. (856) 794-1941  
Fax. (856) 794-2549

### **Private Foundations and Organizations**

The following are additional private organization funding sources that have contributed to bicycle-related projects or programs in New Jersey or elsewhere:

Tri State Transportation Campaign – Funded planning for the Edison Greenway rail trail  
Tri-State Transportation Campaign  
240 West 35th Street #801, New York, NY 10001  
tel. (212) 268-7474  
[www.tstc.org](http://www.tstc.org)  
Email: [tstc@tstc.org](mailto:tstc@tstc.org)



Geraldine R. Dodge Foundation – Contributed funding to non-profit group for the preparation of South-East Morris County Bike Plan and bicycle safety brochures.

Geraldine R. Dodge Foundation  
163 Madison Avenue  
Post Office Box 1239  
Morristown, NJ 07962-1239

Tel. (973) 540-8442  
Fax. (973) 540-1211  
[www.grdodge.org/contact.html](http://www.grdodge.org/contact.html)

Bikes Belong Coalition – Sponsored by members of the American Bicycle Industry. Assistance Grants for up to \$10,000 each as well as for continuing projects to local organizations, agencies and citizens in developing bicycle facilities projects that will be funded by TEA-21, the Transportation Equity Act for the 21<sup>st</sup> Century. Application/Proposal available at:  
[www.bikesbelong.org/grants.htm](http://www.bikesbelong.org/grants.htm)

**Corporate Financial Assistance** in the form of corporate participation to:

- Promote bicycling to work within their own administration and staff
- Provide bike parking and shower at their site
- Provide financial assistance toward education efforts
- Provide financial assistance toward infrastructure improvements



## VI – Bicycle Provisions of the County Transportation Plan

The County Master Plan, Section V, Transportation Plan Goals and Objectives serves “as a guide for public decisions that affect the County transportation and circulation system”. In keeping with current state of the practice, the Plan appropriately recognizes bicycles and bicycling as an integral component in the transportation planning process. Throughout the Plan, reference to bicycle access is made where appropriate and main element Goal VII. Is dedicated to: “*Expand and Improve Pedestrian and Bicycle Facilities in the County*”.

The following two discussions advance and expand upon the existing Transportation Plan’s bicycle components. *Italicized* text identifies current wording in the transportation Plan. Regular text provides comment on or proposed additions/amendments to those items.

### A. Existing Bicycle Provisions

P. 1 – *Goal I: Advance the Growth and Development of the County:*

*Strategies:* 1.

- *Sidewalk and Bicycle Improvements in the zone: (e.g. South Avenue, Bridgeton)*

Greater bicycle circulation planning needs to be done in Bridgeton (as well as Milleville and Vineland) if bicycle use is to become more widespread in these areas. Providing bike racks at various locations necessitates improving bicycle access to those rack locations so that they will be adequately utilized.

Separate municipal (Bridgeton, Millville and Vineland) bicycle circulation and improvement plans should be prepared. Each Plan should identify specific locations for all bicycle parking and bike lanes or bike routes throughout each municipality. Preliminary designs for types of bike lanes, bike routes, and design recommendations for suitable and practical parking facilities should be a primary element of such plans.

2.

- *Promote development of bike and pedestrian trails*

This is an appropriate element that has been investigated and discussed elsewhere in the County Bike Trail Study.

P. 12 – *Goal VII: Expand and Improve Pedestrian and Bicycle Facilities in the County*

*Strategies:*

2. Identify areas where new bike routes, bike lanes, sidewalks, hiking trails and other bicycle and pedestrian links can be made to the existing transportation network.
  - Provide bike racks at all park-an-ride lots
  - Provide bike racks at major transit access locations.
  - NJ Transit currently provides bike racks on all buses in the southern half of the state for greater customer mobility. Local bike planning should include bike access (bike lanes, bike routes, etc.) to transit stops. Separate municipal bicycle circulation plans should identify and include access to specific transit stops.



- Provide bike racks at County and local public facilities: Library, Community College, County Office Complex, municipal buildings, etc.
- Encourage merchants to provide bicycle racks at their establishments. Bike racks can encourage patronage and help keep bicycle parking manageable (preventing bikes from being laid in front of store entryways).

## **B. Proposed Bicycle Provision Additions/Amendments**

In A. above, bicycle elements of the current Transportation Plan were commented and expanded upon. The following discussion presents additional new components not identified in the existing Plan. Page numbers refer to the Transportation Plan where insertions might be made, in order to more easily integrate and cross-reference content in these two documents.

### *P. 2 – Objective B: Strategies:*

All highway improvements and site plans for industrial parks, commercial areas and other centers of economic activity shall include accommodations for bicycles and bicyclists.

- Bicycle parking shall be provided at a rate of 3% of automobile parking. With a minimum of two (2) bicycle parking racks (accommodating four (4) bicycles total) provided at any one facility. Bike racks shall be of the “hitching post” or “bollard” type, as approved.
- Shower facilities shall be provided in buildings or complexes that propose to employ over 100 persons.
- These provisions shall be required of all new buildings or campuses proposing to expand or significantly alter the space configuration or uses.

### *P. 2 - GOAL II: Plan, Design, Construct, Maintain and Manage a Circulation System Which Provides for Efficient Vehicular Movement Within and Through the County.*

#### *Strategies:*

All roadways are open to bicycles, therefore all roadways shall be planned, designed and constructed so as to safely accommodate bicycle traffic. NJDOT Bicycle Compatible Guidelines shall be used in establishing such bicycle compatible widths. This provision is intended to reverse provisions instituted by the NJ Department of Community Affairs’ Residential Site Plan Improvement Standards, notwithstanding as provided in Goal IX, 5. herein below.

### *Pp. 9,10. – Goal IV: Enhance Regional Connections to and from Cumberland County.*

5. Work with Municipalities, NJDOT, DRBA, National Parks Service and other government entities and organizations to promote local and regional bicycle transportation routes, recreational trails, bicycle tourism and ecotourism.

P. 14. 5. Minimize cost of transportation improvements without reducing safety or accessibility for bicyclists and pedestrians.

- Reduced cartway widths are permissible only if the reduction in width is consistent with bicycle and pedestrian-friendly design techniques and is part of an overall traffic calming plan for the area.



# VII – Bike Safety Education

## A. Introduction

No bicycle planning document should be considered complete if it does not address the issue of bicycle driver education. Pedestrian safety education should be an integral part of a thorough program and a precursor to on-road bicycle training, particularly in elementary school grades.

The need for bicycle driver education is evident in the typical behavior of cyclists observed on all of the field reconnaissance trips throughout Cumberland County during the summer of 2000. In both town settings and on rural roads with shoulders, adult and youth cyclists alike, typically were observed riding against traffic, counter to the bicycle provisions of traffic law (a subtle example of wrong-way riding was provided in the May 3, 2000 Vineland *Daily Journal*. In an article about this Study, a cyclist was pictured riding on the left side of the road). In addition, urban cycling comprised of frequent meandering from street to sidewalks, weaving into and out of empty parking spaces, left turning from the left side of the road and mid-block crossing as just a few examples of improper and dangerous cycling. Such behavior interrupts traffic flow and imperils the cyclist and pedestrians alike.

As bad and as potentially dangerous as this behavior may be, it is not at all uncommon, and is actually typical throughout most of the US. The reason for this can be summed into two basic factors:

1. Lack of traffic safety instruction in elementary and secondary school
2. Lack of bicycle-specific traffic control devices installed in the highway (roadway) system

Despite the ubiquity of roads and traffic, too few cities and states in the US have embraced formal traffic safety instruction in a significant way.

The physical and cognitive complexity of riding a bicycle in traffic exceeds that of driving a car. Bicycle drivers must:

- Have knowledge of and obey the same rules of the road as motor vehicles so as to be predictable
- Coordinate balancing and ride in a straight line
- Know where to position oneself on the roadway to be most visible and to ride defensively (avoid riding into opening doors of parked cars, for example)
- Coordinate balancing while riding with one hand when signaling a turn or other maneuver
- Coordinate balancing and maintaining a straight line while scanning behind for traffic before turning or changing lanes
- Power the bicycle/vehicle to accelerate and maintain speed
- Have physical coordination to properly apply brakes for stopping safely and in a controlled manner.

Given the complexity of operating a bicycle, it can easily be seen that substantial amounts of instruction and practice are necessary for competency to be assured. And despite this clear need, sadly, less than one dollar on average is spent per student throughout their entire school career in the US. Instead, traffic safety is mostly “learned” simply by regular exposure when being



transported in cars, buses, vans, etc. Even adults who are licensed and experienced motor vehicle operators will, when riding a bicycle, regularly ignore traffic regulatory devices and “common sense” driving practices.

Bicycle drivers also need to properly equip and maintain their bicycles. Helmets are a critical element in cyclist safety (and required by law for cyclists 14 years and under) although a helmet alone will not ensure safe cycling behavior. According to state traffic law on bicycles<sup>1</sup>, all bikes must have a bell or other audible device. More important, all bikes when ridden at night must be equipped with a front white headlight and a red rear taillight. This statute reads:

**39:4-10. Lights and reflectors on bicycles** Every bicycle when in use at nighttime shall be equipped with a lamp on the front which shall emit a white light visible from a distance of at least five hundred feet to the front, and with a lamp on the rear which shall emit a red light visible from a distance of at least five hundred feet to the rear. In addition to the red lamp, a red reflector may be mounted on the rear, of a type approved by the division which shall be visible from all distances from fifty feet to three hundred feet to the rear when directly in front of lawful upper beams of head lamps on a motor vehicle.

Education / training, infrastructure and enforcement must be used to promote proper bicycle driver behavior, just as with motor vehicle operation. In addition to regular traffic control devices such as signals (Stop and Yield signs, signals, etc.), bicycle-specific traffic control devices are available and should be used. Chapter IX of the standard Manual of Uniform Traffic Control Devices (MUTCD) pertains to Bicycle Traffic Control Devices. Enforcement must play a role in reinforcing proper behavior. But experience shows that unless there is some other aggravating circumstance such as frequent bike crashes, enforcement of bicycle traffic violations is largely ignored by law enforcement personnel, and poor traffic skills continue to be passed on through the population. Enforcement of traffic laws must be upheld. However, punitive measures can be replaced by positive reinforcement measures such as discount coupons, bicycle driver instruction courses or driver training that contain a bicycle driver element.

As presented in the Introduction to this Study, **The Four E’s** of bicycle planning provide a basic guide for a safe, integrated bicycle system including components separate from and shared with motor vehicles:

- θ **Engineering** (and Planning)
- θ **Education**
- θ **Enforcement**
- θ **Encouragement**

Consider that if motor vehicle drivers were not required to have any training or demonstrate any competency in the operation of a motor vehicle, then driving clearly would be far more dangerous than it currently is. Similarly, if the highway system were designed, signed, controlled and patrolled in the same way as roadways then the highway system would be in chaos.

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<sup>1</sup> New Jersey Permanent Statutes, Title 39, sections 39:4-10 through 39:4-14 et seq.



## B. Existing Bike Safety Programs in Cumberland County

In researching existing bicycle safety programs in Cumberland County, we contacted four individuals that had some information about such efforts at differing levels in the County:

- Linda Krsnak of the County Planning and Development
- Sergeant Groff of the Millville Police Department
- Theresa Thomas is an administrator with the South Jersey Transportation Planning Organization and produces the Newsletter of the South Jersey Traffic Safety Alliance (SJTSA).
- A Sergeant at the Port Norris State Police Barracks was questioned briefly about and bike safety efforts that the Police Officers from that location have been involved in.

These inquiry's revealed that single event "Bike Rodeo's" is a common method of providing bicycle traffic safety instruction / information (in most other areas of the state as well, not just in Cumberland County). Other traffic safety instruction venues included school assemblies and classroom lectures, typically by law enforcement officers. Some of the officers who provide instruction have received training for police bike patrols. These officers therefore, have direct bicycle-related training and experience, which is more than is often the case.

The SJTSA coordinated and hosted several "Bike Rodeo's" in the four-county region of SJTPO during the spring of 2000. At least one of the Rodeo's was held in conjunction with a much broader venue: Law Enforcement Appreciation Day which included displays of police motorcycle units, US Coast Guard rescue boat, Crime scene van, the R.A.D. racecar and vehicles from the Police Athletic League ready to ride program. The bike rodeo event held inside a mall included bike registration, free helmet giveaways and bicycle mechanical inspection and minor adjustments. The level of effort necessary to coordinate such an event can be considerable. Given the time actually spent by participants in learning and practicing bicycle safety skills at such an event, the value as a bicycle safety awareness and bike accident preventive measure is questionable.

## C. Recommended Traffic Safety Programs

The League of American Bicyclists (LAB, the League) has, since the 1970's offered the only adult bicycle driver training course in the country. The League also has over 500 trained cycling instructors that are available to conduct its courses; *Bike Ed.* (formerly *Effective Cycling*) in every state.

There have been numerous programs of bicycle safety for children. Many are compilations of materials from sources such as the American Automobile Association, the Bicycle Federation of America and other bike groups. In 1999 the Federal Highway Safety Administration (FHWA) and the National Traffic Safety Administration (NTSA) awarded a Grant to the League to prepare materials for a bicycle safety education program which would form a consistent, standard program that could be distributed and implemented on a widespread basis to schools throughout the country. The program is currently under development and is to incorporate the principles of vehicular cycling evident in *Bike Ed.*

Currently, the Nation's premier youth traffic safety program is currently being instituted in Florida. Contributors to the Florida program are also consulting on the FHWA / LAB effort.



The Florida system consists of teacher training and a program series that begins with pedestrian safety in Kindergarten and first grades, and then graduates to bicycle instruction through the fifth grade. The program has both classroom instruction and outdoor practice components. As with high school driver education in many other states, Florida too, continues with training for this ultimate driver responsibility. This long-term commitment to traffic safety training is based in part on the startling fact that automobile crashes are the single biggest cause of fatality of 18 to 29 year-olds in the US.

It has been an underlying assumption from the beginning of the Florida program that regular comprehensive and thorough traffic safety education from early school grades would ultimately result in better motor vehicle drivers. At present, it is still too early to determine whether this is true or not, since the earliest program participants are just beginning their driving careers.

The elementary school program recognizes that children at this level are developing very quickly, both cognitively and physically. The program takes into consideration their limited skills in physical reaction, perception and information processing. Further, the program recognizes that the attention span of young children is short and the amount of training that can actually be imparted in any given session is very limited. Consequently, the program requires nearly one class session per week. The traffic safety classes may be divided among different subject classes such as health and physical education. Many of the sessions are set in the classroom with demonstrations and video assistance. The remainder of the classes are spent practicing and conditioning those skills in mock settings, then in later years through practice rides through the community. In this regular format, children become accustomed to being aware of traffic from in both a cognitive sense to the point where traffic safety and awareness becomes an automatic response. They also learn that traffic safety is a serious matter, although practice sessions necessarily include some type of game in order to help focus student's attention.

The program materials used in the Florida program are available, but come with strong recommendations that teachers receive specialized training before using the materials and beginning a traffic safety program in their class or school.

For a traffic safety program to be successful, there must be widespread commitment and support from schools, the community, businesses and other organizations. County-level involvement might be provided to schools and other organizations by providing a coordinator and a mobile group of maintained bicycles (with bike mechanic, tools, vehicle and enclosed trailer), helmets and other materials for use at pre-scheduled program locations.

The state of New Jersey by statute funds an annual fund for bike safety programs / materials (see citation below). These funds have traditionally gone to publication of the NJ Bicycle Driver Manual. Currently these funds are used to produce many other materials as well. These materials can be viewed on the NJDOT WWeb site.

**39:4-14.3v1. Educational program for safe operation of bicycles; fund**

The Director of the Division of Motor Vehicles shall use a portion of the fund established pursuant to section 22 of P.L.1983, c. 105 (C. 39:4-14.3v) for the purpose of providing an educational program for the safe operation of bicycles.



## VIII – Next Steps

This Bike Trail Study provides base information from which the County and community groups can plan the future of County and regional bicycle circulation. Section IV of this report expands on the County Ecotourism Plan which provides numerous strategies that could incorporate bicycling into increasing tourism to the County.

This section on Next Steps suggests specific actions that the County may proceed with so that Cumberland County can be made even more inviting to bicycling than it already is.

### I. Immediate Actions

According to County Planning Staff, the following actions can be conducted within the next several months to a year with minimal adjustments to existing work programs and budgets:

#### A. Promotion

- Form a Bicycle Advisory Committee that includes municipal representation, bike organizations, business and other interested parties to advocate for bicycling in the County.
- Initiate discussions with the NJDEP to identify and establish specific bike projects within State Wildlife Management Areas.
- Promote Cumberland County as a biking area to agencies and groups outside the county such as: NJDOT, bicycling magazines, clubs and advocacy organizations for listing in their publications, maps, brochures and calendars of events.
- Link biking with other events such as birding and historic tours. Promote and offer volunteer-staffed “free guarded bike parking” at community events that otherwise would attract cars (municipal celebrations, for example)
- Identify local routes to connect Cumberland County to the NJDOT’s High Point to Cape May Bicycle Touring Route. Coordinate with other Counties as necessary.
- Develop a bike logo identifying special biking areas such as: “Matts Landing – *see it by bike*”
- Incorporate bicycling into the county’s existing tourism, ecotourism and recreational promotions.
- Urge and assist the three Cities of Bridgeton, Milleville and Vineland in initiating detailed local bicycle circulation and facilities plans. Provide assistance with funding applications. Such plans are key elements to make Cumberland County a bicycle-friendly place. Most services are found in urban locations so visiting tourists will benefit. Higher resident populations there would benefit the most from the low-cost transportation alternative of bicycling.

#### B. Physical Infrastructure Improvements

1. Establish a Countywide numbered bike route system The primary mapping effort conducted as part of this study identifies those county roads that are bicycle compatible. Just as the roads are numbered as County Routes for motorized traffic, bike routes on roads may be numbered to assist bicyclists in finding their way. Separate numbering



systems are typically used for bicycle routes since not all roadways are bicycle compatible. It is therefore desirable to avoid confusion for bicyclists by directing them along the most desirable roads. The following signs are examples of official Manual of Traffic Control Devices (MUTCD) bike route marker (number) signs that should be considered.



One method of defining particular routes is by destination. That is, numbered routes would simply connect various destinations along the most direct or desirable roads. For example: CBR 1 (Cumberland Bike Route No. 1) could interconnect Vineland with Milleville. CBR #2 could follow the Coastal Heritage Trail bike route identified elsewhere in this Report. The bike route numbering system could also conform to the Interstate Highway System of even numbered routes being East-West, odd numbered routes being North-South and interconnecting routes being three-digit.

2. Produce a Countywide Signing Plan. Once a bike route numbering system is established, directional and safety signage placement should be identified for those routes. Safety signage location design/planning should be used coincidental with a striping plan. Bicycle striping must direct both cyclists and motorists into proper vehicular behavior. MUTCD provides standards for striping and coincident signage. It should be kept in mind that some of the signing efforts conducted for bicyclists would also assist motorists as well.
3. Budget for signs and other route markings Include a line budget item in the 2001 County Budget. Budget projections should also accommodate future maintenance / replacement of worn signs and markings.
4. Add bicycle compatible design and construction standards for work on County roads and right-of-ways
5. Identify and adopt suitable standards for bike racks NJ Transit currently uses one of the best types of bicycle racks – the “hitching post”. They are cost-effective, unobtrusive, and best of all they are very functional / versatile with all sorts of bikes and locks. Another very functional type of bike “rack” is the bollard type with “handles” to which bikes can be attached.
6. Select and prioritize roadways for improvement to bicycle compatible standards According to the mapping efforts conducted for this study, approximately 30 miles of



roadways are identified as desirable for such improvement. Fortunately, some of these roadways are already included in the County Transportation Plan as Planned Highway Improvement Projects. Other roadways not identified in this Bike Trail Study are slated for improvement according to the Transportation Plan. These roads would further increase the number of bicycle compatible roads in the County.

Identify and locate existing bicycle hazards and other constraints such as incompatible storm water inflow (stream flow) grates, narrowing shoulders and gravel driveway aprons.

7. Produce and install signs and other route markers along selected bike routes
8. Install bicycle racks at public facilities such as the County Library

## **II. Medium to Long Term Actions**

These actions may take several months to several years to initiate due to time requirements, level of effort and resources needed.

### **A. Physical Infrastructure Improvements**

1. Replace bicycle-incompatible infrastructure such as stream flow and other types of hazardous stormwater inlet grates.
2. Repair/replace bicycle incompatible infrastructure as part of ongoing maintenance program.
3. Conduct feasibility study of opportunities, demand and resources for bicycle-specific projects The Bridgeton-Glassboro Secondary rail corridor should be investigated for potential as a Rail -Trail project.
4. Design and construct new bicycle facilities / routes See “Initiate discussions with the NJDEP to identify and establish specific bike projects within State Wildlife Management Areas” in Immediate Actions above.
5. Conduct a feasibility study of constructing a velodrome (bicycle race track) in the County. Similarly, an off-road bicycle race track (cyclocross) could be investigated either separately or as a “Bicycle Park” concept combining the two events.

### **B. Education**

1. Identify and establish a traffic / bicycle safety Curriculum at the elementary, middle and high school levels. High School Driver Education programs could include an extensive section including physical training through practice (as in the LAB program).
2. Acquire and distribute NJDOT bicycle safety literature to younger and adult populations The NJ Bicycle Driver Manual is more appropriate for High School level and adults. Distribution could be provided in bike shops, the County Offices, County Office of Tourism, Municipal buildings, the County Library, etc.
3. Communicate to Businesses, the benefits of bicycle commuting for employees.



# Cumberland County Bike Trail Study

## Appendix I

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14. New Jersey Conservation Foundation, *New Jersey Rails to Trails – Linear Recreation for Abandoned Railroad Rights-of-Way*, 1980
15. Lehr & Associates, Inc., Frederic R. Harris, Inc., for NJDOT, *Concept Development Report, Route 49 Bicycle and Pedestrian Compatibility Analysis – Final Draft*, January 25, 1999.
16. Lehr & Associates, Inc., Frederic R. Harris, Inc., for NJDOT, *Concept Development Report, Route 49 Bicycle and Pedestrian Compatibility Analysis, Borough of Shiloh - Final Draft*, January 25, 1999.
17. Lehr & Associates, Inc., Frederic R. Harris, Inc., for NJDOT, *Concept Development Report, Route 49 Bicycle and Pedestrian Compatibility Analysis, City of Bridgeton, Including Bridge over Cohansey River – Final Draft*, January 25, 1999.



18. Lehr & Associates, Inc., Frederic R. Harris, Inc., for NJDOT, *Concept Development Report, Route 49 Bicycle and Pedestrian Compatibility Analysis, City of Millville, Including Bridge over Maurice River – Final Draft*, January 25, 1999.
19. Lehr & Associates, Inc., for NJDOT, *Scope Development Review for Bicycle and Pedestrian Compatibility – Routes 47 – Sites 2,3& 7in or Near Glassboro, Gloucester County*, September 28, 1998.
20. Lehr & Associates, Inc., Memo to NJDOT Bicycle and Pedestrian Advocate William Feldman, Re: Route 47/55 Section 10-D
21. Lehr & Associates, Inc. Memo to NJDOT Bicycle and Pedestrian Advocate William Feldman, Re: Route 47 and 55 Interchange, Reconstruction of the Cumberland Mall driveway intersection with Route 47.
22. Frederic R. Harris, Inc., Parsons-Brinkerhoff-FG, Inc., *South Jersey Transportation Planning Organization, PHASE I, REGIONAL TRANSPORTATION PLAN UPDATE, Technical Memorandum, Task 1 – Revisit 1995 Plan Goals and Policies. Draft. Apr. –3, 2000*
23. Koerner, Glenn, written/personal communications. Mapping, routing advice. Member of South Jersey Wheelmen bicycle club.

#### **IV. County Information/Submittals**

1. Route 47/Route 55 interchange - Bike Lane proposed
2. Shore Connection Study – Route 55 to Route 47
3. Bike lane being studied in vicinity of Routes 47 and 55, Route 49 Interchange.
4. Various information gathered from the County WWWeb site(s), including Empowerment Zone site.

#### **V. Miscellaneous Pamphlets, Flyers**

1. Township of Commercial, Ecotourism Guide
2. 2000 Cumberland County Events
3. Millville Army Air Museum, Millville Municipal Airport
4. Cohanzick Zoo, New Jersey’s First Zoo, Bridgeton, NJ
5. Historic Bridgeton Museum Guide
6. Bridgeton, Historic Bridgeton, Bridgeton Urban Enterprise Zone
7. City Park and Recreation Facilities, Bridgeton, NJ
8. Hall of Fame All Sports Museum – Serving all of New Jersey, Bridgeton, NJ, A division of the Bridgeton Department of Recreation & Public Affairs
9. A Wild Experience, Cumberland County, New Jersey
10. New Sweeden Farmstead/Museum, City Park, Bridgeton, NJ
11. New Jersey Coastal Heritage Trail
12. Delsea Region - New Jersey Coastal Heritage Trail
13. Lighthouses Near Cumberland County on the Delaware Bay
14. Sightseeing Flights, Cumberland Flyers Inc. Millville Municipal Airport
15. Welcome to Millville, New Jersey
16. Wheaton Village, New Jersey
17. Dutch Neck Village, “A Village of Unique Shops”, Bridgeton, NJ
18. Seabrook Educational and Cultural Center, Upper Deerfield Township Municipal Building, Seabrook, NJ



19. Cumberland County Area Accommodations
20. Victorian Rose Farm, Bed & Breakfast, Oakbarn Antiques & Uniques, Woodstown, NJ
21. The Stone House Inn Bed & Breakfast, Bridgeton, NJ
22. Bank Street Bed & Breakfast, Bridgeton, NJ
23. Parvin State Park, NJ Division of Parks & Forestry

## **VI. Software Used for Mapping, Presentations & Report**

1. Microsoft Corporation, *Microsoft Office 2000 Standard – MS Word, MS Excel, MS Powerpoint*
2. Bikeways Engineering, Inc., *Bicycle Compatibility Evaluation Spreadsheets*, Spreadsheet programs written in MS Excel, September, 1999, June, 2000
3. Adobe Systems, Inc., *Adobe Illustrator 8.0.1, & Adobe Photoshop 4.0 LE*
4. Avenza Global Technologies Corp., *MAPublisher 3.5, 4.0*
5. Cumberland County Geographic Information System (CCGIS), *Road Coverage with Metadata* ARC/Info format.
6. New Jersey Department of Environmental Protection, Bureau of Geographic Information and Analysis, Office of Information Resources Management, *Cumberland County Municipalities*, ARC/Info Format.
7. MAPTECH Terrain Navigator, *New Jersey Complete State Coverage*, USGS topographic maps on CD-ROM, Edition 1.0



# Cumberland County Bike Trail Study

## Appendix II

### **PUBLISHED BIKE ROUTES** **Cross References to the Bike Trail Study Mapping Layer**

Mapping Route Number	Bibliography Reference (Section, Item No.)	Name of Ride in Reference	Miles
1	<b>I. 3.</b>	Greenwich Monument	14
2	<b>I. 1.</b>	Cumberland County Conquest	23.3
3	<b>I. 2.</b>	Cohanzik Zoo	26.1
4	<b>I. 3.</b>	No Signs - Loop 1	7.2
5	<b>I. 3.</b>	No Signs - Loop 2	21.3
6	<b>I. 9.</b>	Bridgeton	66.0
7	<b>I. 2.</b>	Mauricetown	20.3
8	<b>I. 5.</b>	Mauricetown – B	25.0
9	<b>I. 5</b>	Mauricetown – A	26.9
10	<b>II. 5; V. 11</b>	New Jersey Coastal Heritage Trail	---





**Base Data**

Total miles of road evaluated:	<b>262.76</b>
Miles of Evaluated Roads Not Bicycle Compatible*:	<b>72.88</b>
Miles of Evaluated Roads Bicycle Compatible**:	<b>189.89</b>
Miles of Recommended Bike Routes	<b>218.00</b>
Miles of Roads recommended for priority improvement	<b>32.03</b>
Number of County Routes Evaluated	<b>43</b>

Roadway Improvements***	Unit	Quantity	Unit Cost	Total Cost
"Share the Road" Signs	2/mile of non-compatible roads	146	\$ 100.00	\$ 14,575
Route Directional Signs	10/route (approximate)	430	\$ 175.00	\$ 75,250
Shoulder Bike Symbol	2/mile of Compatible roads	380	\$ 20.00	\$ 7,596
Shoulder Bike Lane Signs	2/mile of Compatible roads	380	\$ 100.00	\$ 37,978
	Total signs & symbols	<u>1,335</u>		<u>\$ 135,398</u>

Estimated cost/ mile = \$ **4,227.68**

Priority Road Improvements - 32 Miles (add bike compatible shoulders)

Item	Unit			
Erosion control	LF		\$ 0.50	\$ 169,101
Roadway Excavation	CY (say 8 in depth, 6 ft width)		\$ 11.00	\$ 551,418
Aggregate base 4"th.	CY		\$ 2.00	\$ 67,295
FABC 3"th.	Ton (6.67 SY/Ton)		\$ 45.00	\$ 1,014,604
Topsoil, fertilize & seed	SY (say 6 ft graded area)		\$ 1.50	\$ 454,080
				<u>\$ 2,256,498</u>

Estimated cost/mile = \$ 70,457

Note: Other sources indicate average cost of approximately **\$122,000/mile**

**Separate Trail Improvement**

**Rail Trail**

Haleyville to Port Norris. Distance = 2.85 miles

Total ROW Acres = 17.27

Actual Trail Acres (10 ft wide) = 3.45 (Clear area = 14 ft wide)

Soil Erosion & Sediment Control (LF)	30,096	\$ 0.50	\$ 15,048
Clearing & Grubbing (Acre)	Say 1	\$ 30,000.00	\$ 30,000
Rough Grading (Acre)	5	\$ 7,500.00	\$ 36,273
Finished Grading (Acre)	5	\$ 10,000.00	\$ 48,364
Soil Aggregate Base Course (8 in Thick) (CY)	3,734	\$ 8.00	\$ 29,873
FABC ( 2 in thick) (Ton)	(10 SY/Ton) 1,672	\$ 60.00	\$ 100,320
			<u>\$ 259,877</u>

Estimated cost / mile: \$91,185.06

Note: Other sources indicate average cost for separate paved facilities approx. = \$106,700/mile

Therefore, total cost range = approx **\$260,000 to \$304,000**

Other Costs: Bike Racks: Approx \$250 to \$450 ea.(2 bikes) "Hitching post" or "Bollard"  
Includes 4 in Conc. Slab. Base



**Maintenance Costs**

Tractor with PTO Sweeper attachment \$ 20,000

Roadway Shoulder sweeping of bike compatible roads: Basis: Two passes per year  
Personnel: @\$60,000/annum cost

<u>Miles/day</u>	<u>Total Shoulder Miles</u>	<u>Total Days</u>	<u>Annual Cost</u>
25	759.55	30	\$ 7,011

Materials Maintenance (signs & striping/symbols) 1,335 ea. 5 year life \$ 33,383

\* Non-Bicycle Compatible Roadways evaluated as FALSE on spreadsheets in Appendix III and indicated red on Study mapping

\*\* Bicycle Compatible Roadways evaluated as TRUE on spreadsheets in Appendix III and indicated darker green on Study mapping

\*\*\* All improvements include both directions of travel.

# Cumberland County Bike Trail Study

## Appendix VIII

### MAPPING

#### A. Standards and Database Layers

The mapping used for the County Bike Trail Study is in the NJ State Plane Coordinate System, NAD27 (Projected to NAD83) Datum. Additional information is available from the various digitized information sources cited. The three (3) printed maps immediately follow this Appendix.

The Cumberland County Bike Trail Study map produced for this study includes the following Base Data layers:

- “Road Coverage with Metadata” Provided by Cumberland County Geographic Information System office. Includes all state, county and municipal roads, all working railroads and selected abandoned rail lines. Based on site investigations and Tax Map information, a segment of an abandoned rail line was added in the vicinity of Haleyville and Port Norris.
- “Streams” data obtained from the NJ Department of Environmental Protection’s WWWeb site. Locations of the streams on the Study map are for pictorial/cartographic purposes only. Despite their official source, the Bike Trail Study map does not claim to accurately match this layer with other official source layers.
- County and Municipal boundary data obtained from the NJ Department of Environmental Protection’s WWWeb site.
- Cumberland County Empowerment Zone and Urban Enterprise Zone location data was provided by the County’s Planning Department. UEZ locations are for general pictorial representation only. The accuracy of these sites is not considered accurate according to the provider since it was not generated or plotted using tax map information or other accepted GIS location techniques.
- Village and Destination names and locations were typed and placed by hand. This information was obtained from printed maps provided by the County Planning Department and from numerous informational brochures.
- Published Routes - Data obtained from published books further described below.
- Power and Pipelines – A few high voltage power line corridors are shown. Their locations were obtained from a printed distribution system map provided by Conectiv (aka Atlantic City Electric).

The following additional mapping data and representations were used to produce the Cumberland County Bike Trail Study Map:



## **B. Roadway Bicycle Compatibility Evaluation**

The principal mapping layer and a principal purpose of this Study is to evaluate a significant number of (primarily) County roads as to their compatibility for bicycle travel.

The criteria used to perform the bicycle compatibility evaluations is based on NJDOT *Bicycle Compatible Roadways and Bikeways Planning and Design Guidelines, April, 1996, Table 1*. Table 1 identifies minimum pavement width criteria that has been identified as "...providing sufficient pavement for shared use by bicycle and motor vehicle traffic..." The information in Table 1 was programmed into a MS Excel computer spreadsheet. (A digitized copy of this software is provided to Cumberland County as part of the deliverables of this Study). This bicycle compatibility spreadsheet programming evaluates input information of posted speed limit, AADT, lane width and shoulder width and expresses a TRUE or FALSE result of bicycle compatibility. Field measurements and observations provided lane widths and posted speed limit information. AADT information was provided by the Cumberland County Engineer's office.

Bicycle compatibility evaluation parameters were applied to selected roads throughout the county as well as CR553, CR540 and CR645 where they cross into Gloucester County. GIS mapping plots roads and other linear features in segments and assigns identifying attributes to each of those segments (The entire Cumberland County GIS Road data file contains over 6,500 road segments). The bicycle compatibility spreadsheet TRUE/FALSE results for all of the selected/evaluated roads were imported into the mapping data as an additional attribute. Approximately 260 miles of County roadways were evaluated, represented by 880 discrete segments in the GIS map. The TRUE map attribute was then used to assign a green color code to bicycle compatible road segments. The FALSE map attribute was used to assign a red color code to non-bicycle compatible road segments respectively.

While all of the County roads were not evaluated as part of this Study, the spreadsheet and methods used and provided with this report could also be applied to any other road in the County for evaluating other possible bike routes.

The NJDOT Table 1. bicycle compatible criteria are very specific. Variables not considered and therefore which may raise some question as to a particular roadway's compatibility include: Peak AADT, pavement condition, debris collection, other hazards such as railroad crossings and drainage inlet grates. Some spot constraints were identified in photographs (Appendix V), but most are left for identification and correction by County forces as implementation of the Study recommendations proceeds. To the County's credit, few bicycle hazards were encountered during the field investigations for this study. Most constraints were informally observed in the three cities of Bridgeton, Millville and Vineland, which were not included as part of this Study to any detail.

## **C. Existing Published Bike Routes**

There are numerous guidebooks, brochures, bicycle club listings, etc, which provide maps and descriptions of pre-selected routes that the authors have found to be inviting or attractive for bicycling. For this study, we have selected ten (10) of these routes and plotted them on a separate "Published Routes" map layer. The routes are numbered on the map and cross-referenced to the original source in Appendix II.

