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THE CENTRAL CAMDEN COUNTY BICYCLING & MULTI-USE TRAILS MASTER PLAN

prepared by DVRPC
for the Camden County Board of Freeholders





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Executive Summary

This report presents the master plan for the Central Camden County Bicycle and Multi-Use Trail Network, a proposed network of different types of bicycle and trail facilities linking ten municipalities in Camden County, New Jersey.

When complete, this network will be comprised of both on-road bicycle facilities such as roadways striped with bicycle lanes as well as low-speed, low-traffic roads suitable for bicycle use (referred to in this plan as Recommended Routes) as well as multi-use trails providing off-road facilities for bicycling and walking. Several segments of the proposed network are already in place throughout the study area.

Two different sets of recommendations are made in this report. Network-wide suggestions that should be considered by all 10 municipalities and will require cooperation with each other as well as with Camden County and other regional stakeholders are located in Chapter 5. Some of the network-wide recommendations are:

- ▶ Maintain the existing on- and off-road facilities;
- ▶ Establish standards for each facility type recommended in the plan;
- ▶ Develop consistent network signage to be used throughout the region;
- ▶ Establish county-wide bicycle parking policies and requirements.

As each municipality will be primarily responsible for the facilities within their boundaries, also included in this plan are suggestions for municipal priorities. Complete inventories of all the existing and proposed network facilities located within each of the 10 municipalities are located in the Appendix.

Introduction

In 2007, Camden County, through the Camden County Environmental Commission was awarded a Smart Growth grant from the Association of New Jersey Environmental Commissions (ANJEC) to create a unified master plan of bicycle and multi-use trails in 10 contiguous municipalities in the county.

Camden County contracted with the Delaware Valley Regional Planning Commission (DVRPC) to develop this master plan in cooperation with the 10 municipalities, which include the townships of Berlin and Voorhees and the boroughs of Berlin, Clementon, Gibbsboro, Hi-Nella, Laurel Springs, Lindenwold, Somerdale, and Stratford. It was agreed that upon the completion of the proposed network, these municipalities would pursue the implementation of the recommendations laid out in this report. Figure 1 on page 5 depicts the Central Camden County Bicycle and Multi-Use Trails Master Plan study area.

Integrated into this plan are recommendations from the New Jersey Statewide Bicycle and Pedestrian Master Plan, the DVRPC Trails Plan, and other bicycle and open space and recreation plans that concern Camden County and the municipalities involved in the study.

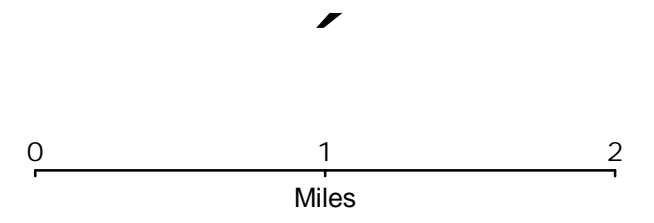
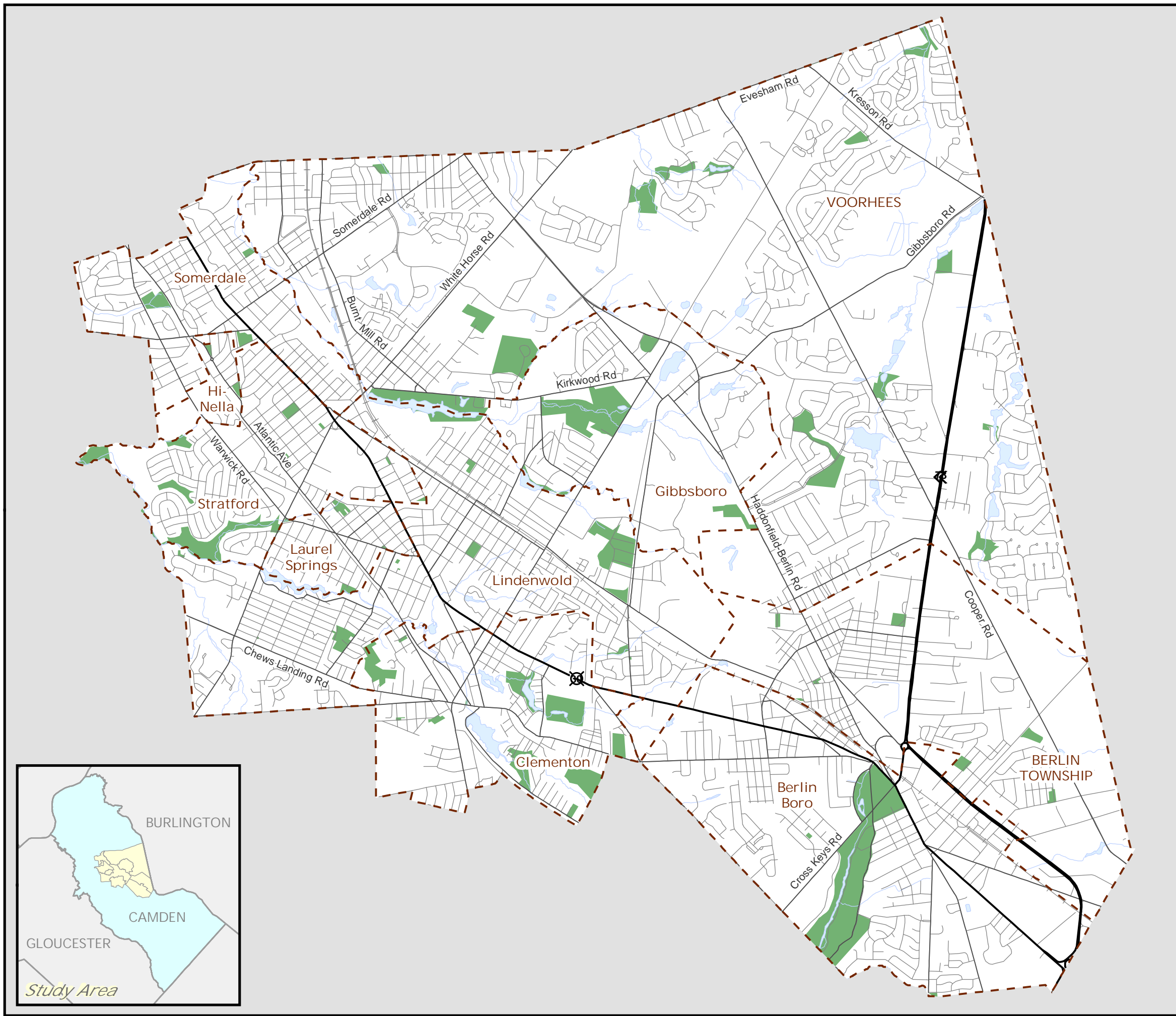
To determine the configuration of the network, existing municipal bicycle and open space plans were examined to determine existing bicycle facilities as well as potential alignments for the multi-use trails that would serve as the major corridors of the network. Through a series of workshops, municipal stakeholders and DVRPC staff worked together to select appropriate trail locations as well as what local and county roads were appropriate for bicycle use and whether these roads required bicycle lanes or if signage alone is adequate.

Stakeholders also worked together to determine a set of local destinations that should be accessible via this network. Finally, three public meetings were held in February of 2009 to display the proposed network to the public and elicit final comments before publication. Draft maps were also displayed on Camden County's website to solicit comments from people who could not attend any of the public meetings.

Also included in this report are descriptions of the different types of bicycle facilities in this report, an overview of the study area, as well as both network-wide recommendations as well as those geared towards individual municipalities. Inventories of existing and proposed facilities in each of the participating municipalities are located in the appendix. Finally cost estimates and possible funding streams are discussed.

Central Camden County Bicycle / Multi-Use Trail Network

Figure 1.
Study Area



Purpose

The overarching purpose of this plan is to enhance local mobility throughout the study area. This means increasing the opportunities for local residents to walk and bicycle for short trips, such as those to school, the store, the train station, or for recreational purposes, by developing a clear set of bicycle and pedestrian facilities and designing them to access local destinations. To achieve this objective, this plan has the following goals:

- ▶ **Create connections**

A regional bicycle network has the potential to create new connections between neighboring municipalities in Camden County.

- ▶ **Connect residential areas to parks, employment centers, schools, and transportation nodes**

A regional bicycle network could facilitate connections between residents and local attractors that they would have otherwise had to drive to.

- ▶ **Create additional recreation opportunities**

A trail network would help combat the growing obesity epidemic by providing adults and children access to not only bicycle recreation, but also by better connecting the residential communities to the regional recreational locations, such as parks and sports fields.

- ▶ **Improve safety for bicyclists and pedestrians**

By implementing a regional network, cyclists will know where to ride (both on and off the road) and drivers will be on the look-out for them in certain locations.

- ▶ **Create uniform system signage**

An implemented network would allow for consistent signage, making bicycle travel safer and bicycle facilities more recognizable and accessible to users.

- ▶ **Establish trail design standards**

Implementing the regional network would establish trail and bicycle lane standards in the region. These standards, as well as the system signage, could be expanded to other municipalities in future network additions.

Existing Plans and Initiatives

In creating the trail network for the 10 municipalities involved in this project, several existing bicycle and pedestrian plans were consulted to determine the extent of the existing trail network, as well as to make note of local initiatives already in place that aid in trail development. Open space and greenway plans pertinent to Camden County were also consulted to determine appropriate alignments for potential multi-use trails.

The New Jersey Statewide Bicycle and Pedestrian Master Plan, Phase 2 (NJDOT, 2004) developed a comprehensive database of existing and potential bicycle and pedestrian facilities throughout New Jersey. It lists regional attractors with the likelihood of generating bicycling and walking trips such as colleges, rail stations, and designated redevelopment areas that are appropriate for bicycle access using level of service (LOS) data. It also included a demand estimation model and a bikeway prioritization model for the entire state.

The Bicycle Facilities Report, Burlington and Camden Counties (Cross County Connection Transportation Management Association, 2004) surveyed commuter bicycle facilities in Burlington and Camden counties at the county and municipal levels. This report ranks the bicycle facilities in the counties based on their proximity to commuter roadways, transit routes, train stations, and other local attractors. Next steps and funding sources were also identified for counties and municipalities pursuing the construction of bicycle facilities.

The New Jersey Green Infrastructure Assessment (New Jersey Conservation Foundation, 2004) conducts a series of GIS-based analyses in order to determine 'greenway hubs' and 'greenway connectors' in the hopes of protecting them from future development. The hubs and connectors described in this report were to become the backbone of a usable greenway network. This report was used to help identify the potential greenway alignments for the Central Camden County Bicycle Network.

The Camden County Open Space and Farmland Preservation Plan (DVRPC, 2004) inventories the open space in Camden County, including greenways, wildlife preserves, and farms. The plan also prioritizes which areas of the proposed greenways are most threatened by development and in need of protection and offers a multi-faceted plan to protect these at-risk locations. The greenways were crucial in identifying the potential trail alignments proposed in this report.

A number of the municipalities involved in creation of the Central Camden County Bicycle Network had previously examined bicycle facilities within their own boundaries. Voorhees Township's Bicycle and Pedestrian Master Plan Update (McCormick Taylor, 2003) details bicycling and walking

conditions in that township and makes recommendations to improve these facilities. The Borough of Clementon Open Space and Recreation Plan (Churchill Consulting Engineers, 2005) creates a plan for the borough to designate and protect open spaces within its boundaries. The White Horse Pike Plan (Camden County Improvement Authority, 2006) lays out a comprehensive redevelopment plan for the White Horse Pike, which extends through seven of the municipalities in Central Camden County and includes improved facilities for bicyclists and pedestrians amongst the other recommendations. The Gibbsboro Bikeway Plan (2006) laid out an ambitious network of off-road facilities that enable bicycle and pedestrian access throughout the borough. The plan also requires developers to assist in the implementation of bikeways adjacent to their properties.

Bicycle Facilities

The past decade has seen the development and refinement of standards and guidelines for bicycle facilities. The Guide to the Development of Bicycle Facilities, published by the American Association of State Highway and Transportation Officials (AASHTO) most recently updated in 1999, remains the principle reference. The Manual on Uniform Traffic Control Devices (MUTCD) also stipulates guidelines for the planning and design of bicycle facilities. NJ DOT publishes its own design guidance, Bicycle Compatible Roadways and Bikeways Planning and Design Guidance (April, 1996), largely based upon earlier versions of the aforementioned manuals. The operation of bicycles is covered under New Jersey's vehicle code. With several exceptions, bicyclists are governed by the same rules as motor vehicle operators, including operation on the right side of the road, stopping, yielding, safe passing distance, and roadway position. Motorists are required to yield to bicyclists in the same way they yield to other motorists, and both motorists and cyclists alike must yield to pedestrians.

The design of safe bicycle facilities is always based on the assumption that a bicycle is considered a vehicle. Facilities that require, encourage, or lead bicyclists to contravene the rules of the road, such as failing to stop at a red light or riding against traffic, are more dangerous than no facility at all, and they expose the roadway agency to legal liability. The best protection against damages and injury is a facility designed according to accepted guidelines and standards.

There are several types of bicycle facilities. While the ubiquitous term 'bike path' has been used to describe anything from an off-road path to a striped lane on a busy road, it is important to acknowledge that there are significant differences between the various types of bicycle facilities. Since various segments of the Central Camden County Bicycle Network are already in place, different designations were used for existing facilities and those being proposed in this report.

The designations for existing facilities were as follows:

▶ **Bicycle Lanes**

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

▶ **Existing Multi-Use Trails**

The primary trails in the bicycle network are off-road, multi-use facilities serving regional functions as non-motorized transportation corridors as well as recreational destinations for bicyclists, joggers, and other users.

Recommended facilities were identified as follows:

▶ **Recommended Routes**

Recommended bicycle routes are shared roadways that have been designated as a preferred route for bicycle use. This could be due to a variety of factors, including the favorable roadway dimensions, lower present speed limits, or the lower vehicular volumes. Bicycle lane striping is not necessary for these road segments, but they are suitable for bicycle use.

▶ **Bicycle Lanes Recommended for Retrofitting**

These roadways, while not currently suitable for bicycle use due to higher speeds and vehicular volumes, could be made more appropriate for bicycling by retrofitting the roadway with designated bicycle lanes in both directions.

▶ **Proposed Trail Alignments**

The proposed trail alignments are potential off-road, multi-use trails. These were generally selected to follow existing or proposed greenways in the study area.

▶ **Connectors**

Connectors are short multi-use trails or on-road segments linking discontinuous street networks and providing neighborhood access to primary trails.

Study Area Overview

Ten contiguous municipalities in central Camden County agreed to work cooperatively to create a network of multi-use trails, on-road bicycle lanes, and recommended bicycle routes to serve bicyclists and other users of all ages and experience levels. Table 1 lists the participating municipalities, the estimated 2005 populations and the square mileage of each municipality.

Table 1: Municipal Information

Municipality	2005 Population	Square Mileage
Berlin Borough	7,395	3.6
Berlin Township	5,365	3.3
Clementon Borough	4,913	2.0
Gibbsboro Borough	2,435	2.2
Hi-Nella Borough	1,009	0.2
Laurel Springs Borough	1,927	0.5
Lindenwold Borough	17,158	3.9
Somerdale Borough	5,192	1.4
Stratford Borough	7,271	1.6
Voorhees Township	28,854	11.6
Total	81,519	30.3

Source: Census, 2000

The 10 study municipalities involved in creating this network range from small municipalities, such as Hi-Nella Borough, which in 2005 had a population of 1,009 occupying 0.2 square miles, to larger townships such as Voorhees, which in 2005 had almost 29,000 people spread out over 11.6 square miles.

In total, these municipalities have a population of over 81,000 residents, and occupy just over 30 square miles in central Camden County. The average population is just over 8,000 residents while the average square mileage of each municipality is just over three square miles. DVRPC forecasts the 10 municipalities to experience a small increase in population between now and 2035, though a high percentage of that growth is forecast for Voorhees Township.

Journey-to-Work Data

Table 2 on the following page depicts the journey-to-work statistics in the 10 municipality study area. Data is taken from the 2000 U.S. Census.

Table 2: Journey-to-Work Statistics

Mode	Total Number	Percentage of Total
Car	33,906	84.9%
Public Transportation	3,854	9.6%
Bicycle	57	0.1%
Walking	831	2.1%
Other	277	0.7%
Work from home	994	2.5%
Total	39,950	100.0%

Source: DVRPC, 2005

As evidenced by Table 2, the majority of workers aged 16 and up in the study area (85%) either drive alone or carpool to work. Almost 10 percent use public transportation, while two percent walk to work and another two percent work from home. Less than one percent of all workers identified 'other' means of getting to work, while a nominal number of people in the study area, 57 in total, or 0.1 percent of the workers in the study area, selected bicycle as their primary means of getting to work.

Journey-to-Work statistics also reveal that of the almost 40,000 people aged 16 and up who work in the study area, roughly 22 percent (almost 8,700) both live and work within the boundaries of the 10 participating municipalities. This seems to indicate that many work trips are short in terms of duration, and if a comprehensive bicycle trail network were in place, it might serve as an attractive mode of commuting for area residents.

Land Use

The ten municipalities involved in the trail network plan contain a multitude of different land uses. Figure 2 on the following page depicts the land uses in the study area relative to location.













Single-family housing (detached) makes up just over 30 percent of the total land use in the study area. The study area is fortunate to contain a substantial amount of wooded land. This constitutes almost 27 percent of the study area. Transportation uses make up just over 17 percent. Commercial uses occupy roughly 9 percent of the study area.

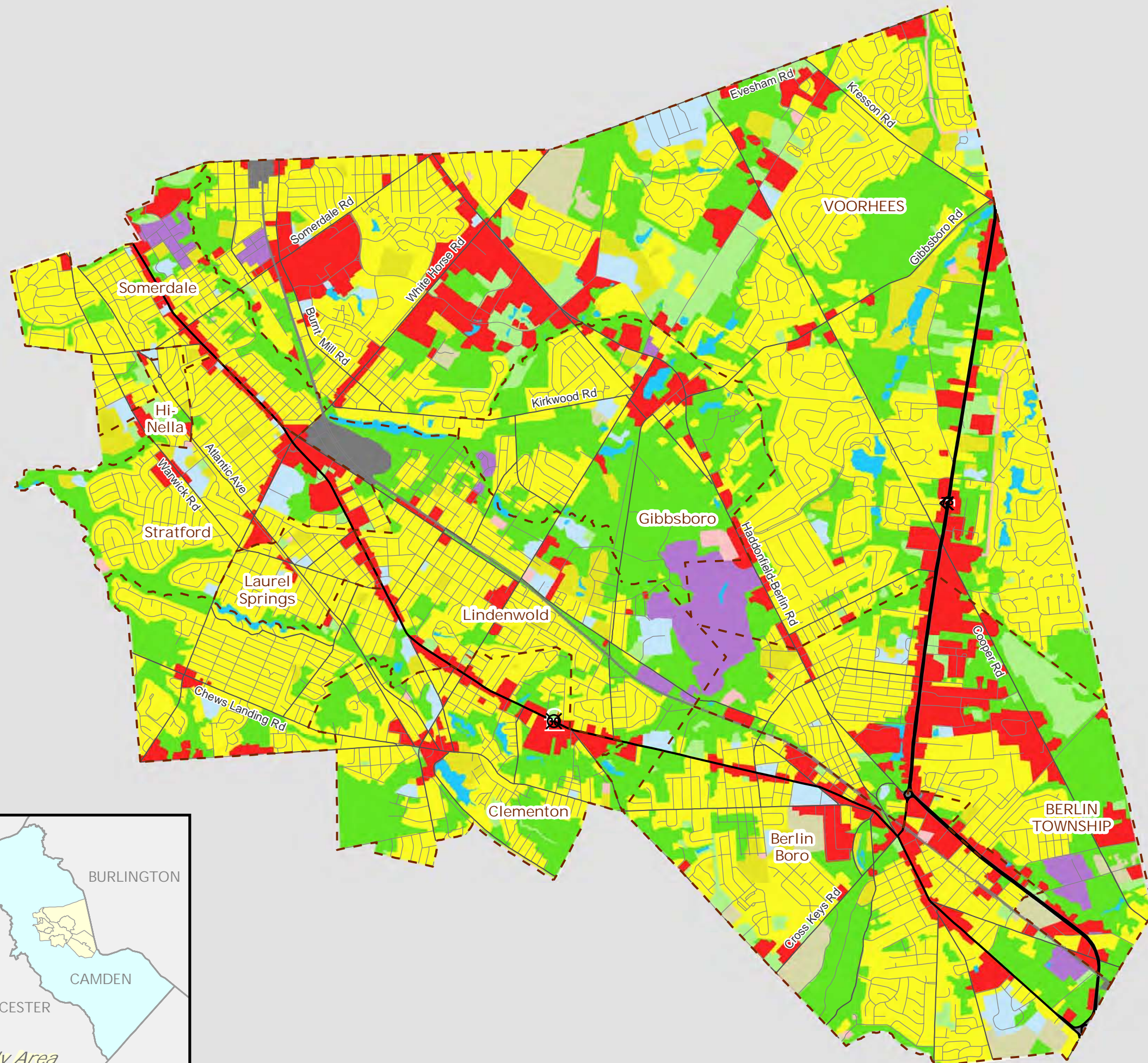
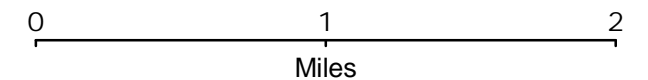
The remaining 17 percent consists of vacant land use (4 percent), multi-family attached residential (3.2 percent), agriculture or mining (1.8 percent each), community services (1.6 percent), water (1.1 percent), and manufacturing or utility (under 1 percent each).

Central Camden County Bicycle / Multi-Use Trail Network

Figure 2.
Land Use

2005 DVRPC Land Use

-  Agriculture
-  Commercial
-  Community Service
-  Manufacturing and Mining
-  Military
-  Residential
-  Recreation
-  Transportation
-  Utility
-  Vacant
-  Water
-  Wooded



Method

The development of the Central Camden County Bicycle Network required the consideration of various factors. This section details the steps involved in determining the types of on and off-road facilities that the network would require, as well as the local attractors that should determine the location of those facilities. A series of workshops were held with local stakeholders to determine these proper configurations, and the public events held in February, 2009 allowed for comments and final edits. It should be noted that the facilities proposed in this report are recommendations, and if in the future, parallel facilities are deemed more suitable for inclusion in the network then those should be used. Figure 3 at the end of this chapter depicts the Central Camden County Bicycle and Multi-Use Trails Master Plan.

Inventory existing bicycle facilities

The first step in the creation of the regional trail network was to inventory the existing bicycle facilities in the study area. This includes both on and off-road facilities and helped to provide a starting point for the creation of the trail network.

The two types of existing facilities are bicycle lanes and multi-use trails. Bicycle lanes are on-road facilities delineated by striping and are typically located on wider roads with higher speeds and traffic volumes. Multi-use trails are physically separated from vehicular traffic giving bicyclists and other users their own right-of-way. These trails can be located in parks or other recreation facilities as well as adjacent to existing roadways. These trails can also be used by joggers, walkers, and other recreational users.

There are already a number of roadways with bicycle lanes in the study area but they are dispersed and disconnected. Voorhees Township has a number of roadways already striped with bicycle lanes, but no other municipalities have anything resembling a bicycle network.

Centennial Road, which runs from north to south through several municipalities, is the only major arterial in the study area that is striped for any significant distance, although some segments of Atlantic Avenue, Somerdale Road, and Berlin Road do have bicycle lanes. There are no road segments in Berlin Borough, Berlin Township, Clementon, Hi-Nella, Laurel Springs, or Stratford that currently have bicycle lanes.

A few multi-use trails are also present in the study area. Many of these are components of the Gibbsboro Greenway, a well-developed set of multi-use trails that traverse the open space in that borough. There is also a multi-use trail running through Berlin Park, a small piece of trail along Egg Harbor Road in Lindenwold, and a small trail in Voorhees. These trails are not connected in any way to each other, the surrounding municipalities, or any of the local attractors.

The current network does not provide any bicycle connections between Berlin Township, Berlin Borough and the other municipalities in the study area, leaving them isolated from the other municipalities in the study area. Likewise, the municipalities in the southwestern portion of the study area are isolated from the other municipalities due to a lack of bicycle facilities.

Locate regional attractors and schools

As noted previously, one of the primary goals of the Central Camden County Bicycle Network is to provide area residents with better bicycle access to local attractors within the study area. If access to these points is not available via the bicycle or foot, few area residents will have the opportunity to bicycle or walk to work, school, or shopping, and bicycle travel will remain primarily a recreational transportation mode. Regional attractors selected for the bicycle network include train stations, shopping centers, recreational facilities and office parks. Another benefit to having a comprehensive bicycle network is that it will afford the opportunity for children to ride bicycles more safely. This could potentially translate into more children bicycling or walking to school. Making sure that local schools are accessible via the trail network was also an important component of the plan. In a series of workshops, project participants from the various municipalities chose locations that would make appropriate connection points for the regional trail network.

Existing bicycle facilities already provide some access to the regional attractors in the eastern portion of the study area. There is, however, little connection between the residential neighborhoods in the study area and the local attractors. This makes cycling an unattractive or unviable option.

There are several business parks located in the study area. These are concentrated in Voorhees and Berlin Townships. Shopping Centers are also concentrated in these municipalities, although there are small shopping centers dispersed throughout the study area. Two train stations are located in the study area, Ashland Station on the PATCO line, Lindenwold Station which is both the terminus of the PATCO line and a stop on the NJ Transit Atlantic City Line. Atco Station, also located on the NJ Transit Atlantic City Line is located in Waterford Township in close proximity to both Berlin Borough and Berlin Township.

In the western portion of the study area, many schools are located on roadways with bicycle lanes. Schools in Voorhees and both Berlin Township and Borough are not served by the existing network of

bicycle lanes and multi-use trails. Overall, there is poor connectivity between residential neighborhoods and their schools, making it difficult and potentially dangerous for children to bicycle to school. This forces school districts to provide buses to students who live in close proximity to the school. The lack of connectivity also leads many parents to choose to drive their children to school if buses are not provided.

Plan trail alignments along proposed greenways

In 1998, Camden County residents voted overwhelmingly to create a trust fund for open space, recreation, farmland, and historic preservation for the county. In 2004, DVRPC published *Camden County Open Space and Farmland Preservation Plan* in response to dwindling open space in the county. To date, over 1,700 acres of open space and farmland, in addition to 40 recreational facilities and 12 historic properties have been preserved or enhanced with Trust Fund monies. The properties located within the boundaries of the municipalities involved in the bicycle network are listed in Table 3.

Table 3: Protected Open Space in Study Area

Property	Location	Acres
Hannigan Property	Berlin Borough	2.42
Kelly Property	Berlin Borough	0.80
Kiejdan Property	Somerdale Borough	9.33
Kirkwood Forrest	Voorhees Township	15.40
Kresson Lake	Voorhees Township	7.20
Lafferty Property	Voorhees Township	43.50
Lake Worth	Lindenwold Borough	52.87
Lake Worth II (Lake Avenue Property)	Lindenwold Borough	8.99
Lange Property	Berlin Borough	5.80
Laurel Ravine	Lindenwold Borough	63.25
Samost Tract	Gibbsboro Borough	36.70
Signal Hill	Clementon Borough	34.54
Stafford Farm	Voorhees Township	139.62
Total		420.42

Source: Camden County Open Space, 2008

A total of 13 separate properties spread across six municipalities in the study area have been purchased using the Camden County Open Space Trust Fund. These add up to approximately 420 acres, just over two percent of the entire study area and approximately 25 percent of 1,700 acres preserved to date.

The proposed greenways are based on a detailed analysis of undeveloped corridors of land from aerial digital photography, as well as four pre-existing greenway plans: the Camden Greenways Plan, the Trust for Public Land’s River to Bay Greenway, the New Jersey Conservation Foundation’s

Garden State Greenways Project, and the National Park Service's Wild and Scenic River Study for the Great Egg Harbor.

The greenway system is based largely on the county's waterways. Connections between the greenways were identified in order to create a true open space network that functions better for both wildlife migration and recreation. Linkages along undeveloped lands were identified where they were available, and when no such connection could be achieved, an on-road connector was identified. Existing and proposed trails were incorporated to provide connections as well. Complete connections between greenways were identified with the thought that greenways themselves would contain a public access/trail component, and that they should therefore all be connected. The proposed greenways that are located within the study area are described below.

Big Timber Greenway

The Big Timber Greenway forms a boundary between Camden and Gloucester counties, from Big Timber Creek's mouth at a cove in the Delaware River to where the North and South branches fork near Clements Bridge Road. Aerial photography indicates that development has been built right up to the creek's edge in many cases. The New Jersey Turnpike, the 42 Freeway, Route 295, Route 130, and Route 47 all cross the creek at different locations, further breaking up the continuity of the greenway. With proper environmental controls, however, the landfill areas in Bellmawr and Runnemede (outside this plan's defined study area) could be reused as greenway lands. Efforts by bordering Gloucester County municipalities would also be needed to create the greenway. The greenway terminates at the Delaware River, providing an opportunity to increase access to the riverfront, especially if the waterfront promenade is achieved in Gloucester City. In addition, this greenway provides a link to the Delaware Riverfront. Based on these factors, the greenway is a Medium Priority.

The Big Timber Greenway traverses many municipalities in the study area, including Somerdale, Hi-Nella, Stratford, Laurel Springs, Lindenwold, and Clementon boroughs. Several pieces of the greenway have already been protected by the Camden County trust.

River to Bay Greenway Spine A and Spine B

The Trust for Public Land, a national non-profit land conservancy organization, seeks to create the River-to-Bay Greenway, linking the Delaware River at Camden City to the Barnegat Bay. This initiative involves the acquisition of properties in Camden County as well as Burlington and Ocean counties.

When the Trust for Public Land conducted the Delaware River to Barnegat Bay Greenway Framework and Concept Plan, they called the North Branch of the Cooper River ‘Spine A’ and the South Branch ‘Spine B’. Spine A continues past the North Branch’s headwaters in Voorhees to connect with Wharton State Forest in Waterford Township (outside of the study area). The greenway already encompasses many municipal parks in Voorhees and in other municipalities, and what is not parkland is still open space, offering the possibility of a continuous green connection from the Delaware River to the state forest.

Because a trail connection is part of the concept for the River-to-Bay Greenway, acquisition and conservation easements with public access need to be the primary strategy. The greenway is ranked High Priority due to its regional nature, its relatively high threat of development, and its connection to both the Delaware River Waterfront and the Beagle Club Woods Natural Heritage Priority Site in Voorhees.

In the original TPL framework plan, Spine B followed the south branch of the Cooper River to its headwaters in Gibbsboro and then down to Pine Hill Borough where it then reconnected with Spine A through Berlin Borough and Berlin Township. The greenway is ranked High Priority because of its regional nature, relatively high threat of development, its connection to the Delaware River as well as its incorporation of the Natural Heritage Priority sites.

In the study area, the two River-to-Bay Greenway Spines traverse several municipalities, including Voorhees Township, Berlin Township, Somerdale Borough, Gibbsboro Borough, Lindenwold Borough, and Clementon Borough. Using the proposed greenways as a guide, stakeholders sketched trail alignments to better connect the vast array of greenspace available in the study area. These trail alignments, once implemented, will serve as the primary corridors for bicycle travel in the study area.

Determine appropriate on-road facilities

While off-road facilities will serve as the primary bicycle corridors, additional on-road facilities are needed to better connect the residents of the study area with attractors, as well as the proposed trails. In this plan there are two types of proposed on-road bicycle facilities. In this plan they are referred to as Recommended Routes and Roadways in Need of Retrofitting.

Recommended bicycle routes are defined as roadways that, due to lower speeds and traffic volumes, are more suitable for bicycle use than other roads in the study area. These roads do not require bicycle lanes (and in some cases, adding bicycle lanes would not be feasible) but would require consistent signage to announce them as part of the bicycle network and direct users to local attractors.

The other type of on-road facility proposed in this plan is roadways that are recommended to be retrofitted to include line-delineated bicycle lanes. These roadways have higher speeds and traffic volumes and the necessary cartway width to support bicycle lanes. These roads are important components of the bicycle network as they will serve as the primary on-road corridors in the network. In some cases, the roadways recommended for retrofit would be extensions of already-existing bicycle lanes, closing existing gaps. Many of the roadways recommended for bicycle lanes are county roads, meaning that the local municipality would work with the county on lane maintenance and upkeep.

Proper maintenance (such as making sure that shoulder lanes are clearly visible and that shoulders remain clear of debris) is integral to making these recommended routes accessible to bicycles. Incorporating these recommended roadways into the overall bicycle network would also require consistent signage on documentation (i.e., maps) and along roadways, so users know that these routes are safe for bicycle travel even without separated bicycle facilities and drivers know to be aware of the presence of bicyclists.

Complete the network with ‘connectors’

The final step in designing the Central Camden County Bicycle Network was to locate possible ‘connectors’. Connectors are defined as being short multi-use trails or on-road segments linking discontinuous street networks and providing neighborhood access to primary trails and, in some cases, to regional attractors. These can be located on either public or privately owned land, and in some cases would require easements and some construction work to create the trail.













The connectors provide access from residential neighborhoods to the bicycle lanes and multi-use trails, which serve as the primary components of the trail network. They can also facilitate greater access to regional attractors, such as schools, train stations, and office parks. More than any other facility proposed in this report, connectors are conceptual. Some of the proposed connectors may be infeasible, but the link that they provide, whether it is connecting a residential neighborhood to the network or to an attractor, is important to the overall network. If a connector proposed in this plan is deemed infeasible, then adjacent alternatives should be examined.

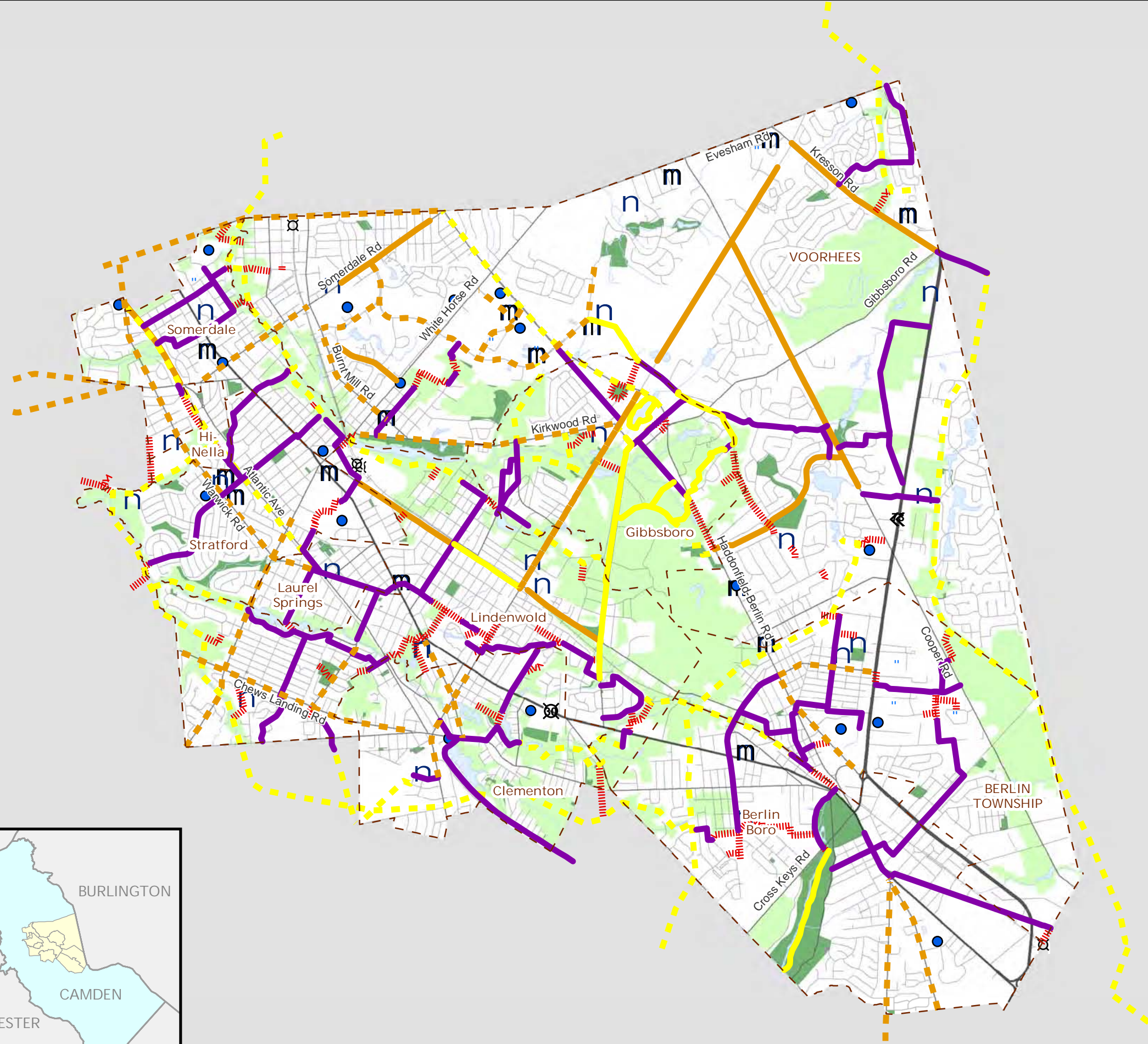
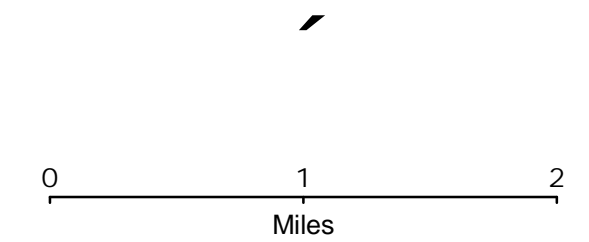
Figure 3 on the following page depicts the Central Camden County Bicycle and Multi-Use Trail Master Plan, as agreed upon by regional stakeholders.

Central Camden County Bicycle / Multi-Use Trail Network

Figure 3.

Network Plan

-  Existing Bicycle Lane
-  Proposed Bicycle Lane
-  Existing Multi-Use Trail
-  Proposed Multi-Use Trail
-  Connector
-  Recommended Bicycle Route
-  Business Park
-  Shopping Center
-  School
-  Train Station
-  Proposed Greenway
-  Park



Network Recommendations

This chapter make general recommendations in regards to bicycle parking, facility signage, and trail standards, as well as recommendations related to the roles that education and enforcement play in safer bicycling and walking. These recommendations represent network-wide policies that could increase bicycle usage in the region, and ensure that the network is working at an optimal level. It will be necessary for the municipalities to work together to meet the needs of the proposed network as well as the area’s cycling community. Adopting county-wide policies will aid in making the plan become an on-the-ground reality. Also included at the end of this chapter are a set of recommendations for each individual municipality.

Existing Facility Maintenance

Keeping facilities already in place in the study area in a state of good repair is paramount to the creation of the broader bicycle and multi-use trail network outlined in this report. Developing a clear method of identifying maintenance issues and prioritizing their repair will be necessary, especially as the network grows and there are more facilities to manage. Since the network is comprised of both on- and off-road facilities, the municipalities, Camden County, and the New Jersey Department of Transportation will have to work together to develop a way to respond to network maintenance issues. Some general recommendations are:

- ▶ Maintain roadways and bikeways to a relatively hazard-free standard. This can be accomplished by:
 - ◆ Sweeping pavement edges and paved shoulders with sufficient care.
 - ◆ Patching surfaces as smoothly as possible and requiring other agencies or private companies to do likewise whenever they dig up a road or trail.
 - ◆ Making sure pavement overlay projects feather the new surface into the existing one or otherwise do not create new linear joints.
 - ◆ Replacing such hazards as dangerous grates or utility covers as the opportunity arises.
 - ◆ Patching potholes in an expeditious manner.

- ◆ Routinely cutting back all encroaching vegetation, especially on trails or popular bike routes.
- ▶ Encourage bicyclists to report maintenance problems and hazards. This can be accomplished by:
 - ◆ Developing a bicycle spot improvement form and distributing copies throughout the bicycling community.
 - ◆ Making sure returned forms are acted on in a timely fashion.
- ▶ Design and build new roadways and bikeways in such a way as to reduce the potential for accumulating debris. This can be accomplished by:
 - ◆ Using edge treatments, shoulder surfaces, and access controls that reduce the potential for accumulation of debris
 - ◆ Using materials and construction techniques that increase the longevity of new trail surfaces.
- ▶ Include maintenance costs and clearly spelled-out maintenance procedures in all bicycle facility projects. This can be accomplished by:
 - ◆ Including reasonable estimates of the maintenance costs in the project budget.
 - ◆ Establishing clear maintenance responsibilities in advance of construction.

Current policies used by any agency involved in the maintenance of bicycle and trail facilities should be reviewed. If necessary, changes should be made to normalize the process of reporting and making repairs. As new facilities are considered, designers should look at low-maintenance options if possible. Policies must be comprehensive, and cover everything from pothole repair to sign location and visibility.

Design Standards

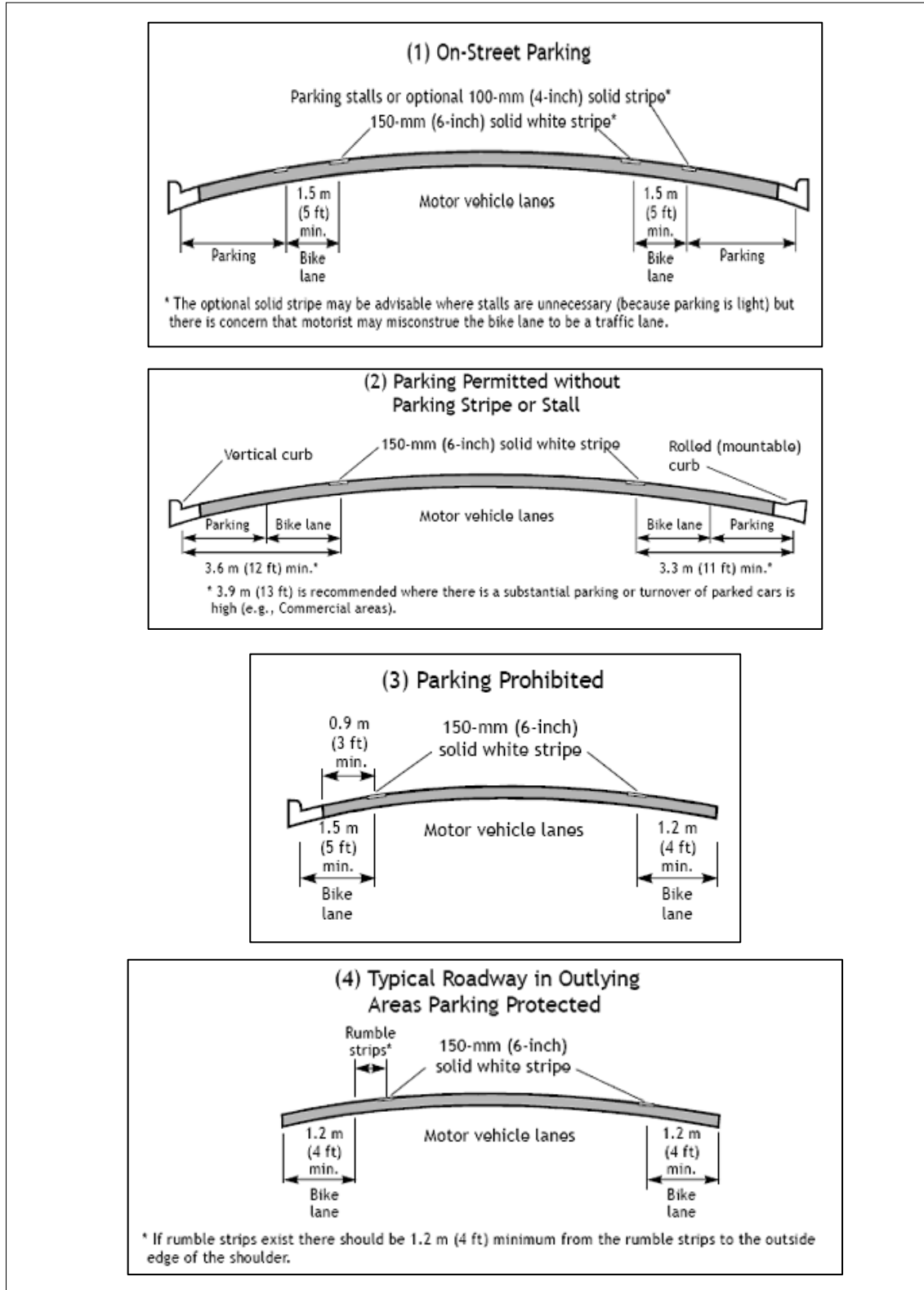
Each type of facility recommended in this plan will have different requirements related to their design and construction. Network-wide standards must be put into place to ensure that the facilities are safe for bicycle travel and can be properly maintained as easily as possible. Maintenance issues should be considered in the design process. Design standards should be considered on not only the facilities recommended in this report, but also on any other roads that cyclists may use. Specific recommendations for each of the facilities discussed in this report are:

- ▶ Recommended routes
 - ◆ Provisions for a smooth surface have been made (utility covers to grade, bicycle-safe drainage grates, potholes are filled, etc.).
 - ◆ Signs are visible to cyclists, motorists, and pedestrians.
 - ◆ Maintenance of the route will be sufficient to prevent the accumulation of debris.
 - ◆ Street parking be removed/restricted in areas of critical width to improve safety.
 - ◆ Shoulder or curb lane widths are sufficient.

- ▶ Roads with bicycle lanes
 - ◆ The recommended width of a bicycle lane is 5 feet from the edge of the curb to the lane stripe.
 - ◆ The pavement surface should be smooth and free of structures, as bicycles are more susceptible to these grade variations than automobiles.
 - ◆ Bicycle lane markings should clearly delineate the bicycle lane from the traffic lane as well as the parking lane (if present).
 - ◆ Bicycle lanes should be placed on the right side of the street on both sides of the street whenever possible.
 - ◆ Bicycle traffic should move in the same direction as vehicular traffic.
 - ◆ Striping should not traverse pedestrian crosswalks.

Some recommended designs for roads with bicycle lanes are located in Figure 4. These designs are recommended by the Federal Highway Administration (FHWA) and supported by The American Association of State Highway and Transportation Officials (AASHTO).

Figure 4: Typical Bicycle Lane Cross Sections



Source: FHWA, 2008

- ▶ Multi-Use Trails and Connectors
 - ◆ The recommended width for a two-directional shared used path is 10 feet. Eight feet can be adequate in special circumstances. A one-directional path should be six feet wide.
 - ◆ A minimum 2-foot wide graded area should be maintained adjacent to both sides of the path. If the path is adjacent to canals, ditches, or slopes, a wider separation or protective barrier should be considered.
 - ◆ Vertical clearance should be at least 8 feet; greater if need be to permit passage of maintenance vehicles.
 - ◆ Multi-Use Trails must be built to meet the requirements of the Americans with Disabilities Act (ADA). Particular attention should be paid to alignment and grade.

Other factors that should be considered in the design process are traffic signals, approach treatments, pedestrian/bicycle refuges on busy streets, and railroad crossings. As new facilities are considered, different types of design issues may manifest themselves. For more information, it is useful to examine FHWA's publications on bicycle and pedestrian safety and AASHTO's *Guide for the Development of Bicycle Facilities*.

Network Signage

Clear, consistent signage throughout the entire network is an important component of implementing this plan. The same type of on-street signage should be present in all maps and other documents relating to the bicycle network. Signage should be simple and direct so as not to mar the landscape and to minimize cost. Signs should be color-coded according to facility type, and should be clearly visible to cyclists, pedestrians, as well as drivers. Signs should also point users in the direction of regional attractors and let them know the distance to these attractors as well as other network facilities. If the network is to grow, it may make some sense to number the facilities and have them correspond to any maps created for the network.

Since some of the bicycle facilities that are slated to become part of the overall network are already in place, development of a system of network signage is something that the municipalities can begin coordinating immediately. There are already some way-finding signs located in the study area. Figure 5 depicts some of the signage already being used in one or more of the municipalities involved in this plan.

Figure 5: Examples of Existing Network Signage



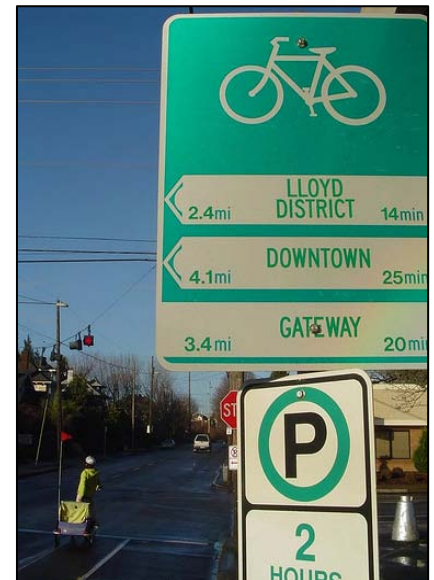
Source: DVRPC, 2008



Source: DVRPC, 2008

Figure 6: Potential Network Signage

Figure 5 depicts two examples of specialized signage currently found within the study area. Signs like these, along with those recommended in the Manual on Uniform Traffic Control Devices (MUTCD) are located throughout the study area. This report does not recommend replacing existing signage. Whenever possible, new signs should reflect those currently in place to avoid confusion and inconsistency. Figure 6, right, depicts a bicycle sign on an on-road facility in Portland, Oregon. The distances to local attractors are clearly marked, as are estimated travel times. While such details may not be appropriate for each type of facility, the information might prove useful in certain circumstances.



Source: www.bikeportland.org, 2008

The overall design of the network signage is not as important as having it be consistent and legible. This will make it easier for users to navigate the bicycle and multi-use trail network and will get drivers used to seeing the new signs and more cyclists on the road.

Bicycle Parking

Bicycle parking is an often-overlooked component in bicycle plans and programs. Without a secure and convenient location to park a bicycle, the trip becomes less attractive and motorized travel becomes more likely. This means that all local attractors must have sufficient bicycle parking, and that this parking should be visible, accessible and secure.

Site views conducted in the study area indicated that attractors such as train stations and many local schools had suitable amounts of bicycle parking. Local parks and other recreation centers had some bicycle parking, but these attractors should have ample bicycle racks, particularly if they come into contact with multi-use trails.

Ensuring that local attractors such as office parks and shopping centers allow room for bicycle parking will require cooperation with local employers and businesses to make sure that they allow for bicycle parking on their properties. Currently there is not a bicycle parking ordinance in place in Camden County. It is recommended that one be put in place that requires some amount of bicycle parking for both existing and new developments. This code can be customized to fit different types of regional destinations. The ordinance should also make clear that the bicycle parking should be located nearby building entrances, not hidden in the back, forcing users to walk long distances to go into an office building or store.

Again, all municipalities should be consistent in regards to bicycle parking. A county-wide policy directing bicycle parking requirements would be most effective, especially if expanding the bicycle network beyond the 10 municipalities in this plan is desirable.

Education, Encouragement, and Enforcement

The physical implementation of the bicycle and multi-use trail network must be complemented by educational programs, projects that encourage people to bike and walk, and more stringent enforcement that provides for safer bicycling and walking conditions.

Educational programs can be geared towards children and parents as a way to increase walking and bicycling to school. Assemblies that discuss bicycle and pedestrian safety as well as the appropriate procedures, as well as bicycle riding lessons for children should be considered. Procuring helmets for school-children at a low cost should also be explored. Classes for adults in proper bicycle-riding

etiquette may be taught at area recreation centers are also a way to foster bicycling in the region. Drivers must also be educated in the rights of cyclists and pedestrians. Using the traffic school curriculum and producing a brochure explaining these rights will assist in this capacity.

Encouraging people to walk or bicycle can take several forms. For children, special events such as walk/ride to school days and bicycle rodeos increase interest in walking and bicycling. County officials can work with local businesses to offer benefits to workers who choose to bicycle or walk to work. Having clear routes available online could also encourage local residents to walk and bicycle more frequently. Working with local police to enforce traffic laws also may encourage more bicycling and walking.

Designing, engineering, and building the Central Camden County Bicycle and Multi-Use Trail Network must be complemented by policies that create a strong environment for bicycling and walking. By educating the public about the benefits of bicycling and walking, encouraging users of all ages to do so, and enforcing laws to create a safe environment, more and more people will choose to walk and bicycle.

Summary of Municipal Priorities

Table 4 on the following pages summarize the priorities for each of the 10 municipalities in the study area. In some cases, recommendations for specific segments of the network are given. In others, particularly in municipalities with only a handful of proposed facilities, general comments are more appropriate.

Table 4: Municipal Priorities

Municipality	Priorities
Berlin Borough	<p>Focus primarily on the recommended routes, as they make up the largest percentage of the network in Berlin Borough and offer access to attractors. The connector between Franklin Street and Park Boulevard would provide access to both the park trail and Franklin Street (a recommended route) which connects to the network outside the borough.</p>
Berlin Township	<p>Mt. Vernon Avenue, a recommended bicycle route that connects to both local schools and roughly parallels Route 73 is a crucial link to the bicycle network in Berlin Township. Commerce Lane, a recommended route that provides access to the industrial parks and business centers in West Berlin, as well as allows for a potential future connection to the River-to-Bay Greenway is also an important facility.</p>
Clementon Borough	<p>Clementon has a number of parks that could be accessed via the proposed network. Atlantic Avenue and Trout/Brand Avenue, both recommended routes, provide access to some of these parks and connect to some of the borough's residential areas. Bicycle lanes on Chews Landing Road and White Horse Pike would provide direct access to Clementon Amusement Park.</p>
Gibbsboro Borough	<p>Bicycle lanes on Clementon Road and the completion of the Bridgewood Lake Bikeway connector would provide greater access to the Paintworks Corporate Center and parks located along Clementon Road, but also enable access to the U.S. Avenue West Bikeway. Completion of the Hilliards Creek Wildlife Preserve Trail (off of Clementon Road) would allow for greater access to that attraction and would allow for a possible off-road connection to Gibbsboro Elementary School.</p>
Hi-Nella Borough	<p>Bicycle lanes on Warwick Road would allow Hi-Nella high school students in Hi-Nella to ride to Sterling High School, located on Warwick Road in Stratford. Creating an Atlantic Avenue Bicycle Trail would provide connections to neighboring municipalities and services.</p>
Laurel Springs Borough	<p>Stone Avenue links downtown Laurel Springs, the Elementary School, and residential side streets and should be the main bicycle thoroughfare in the borough. It also connects to Kennedy Hospital, although this portion would require bicycle lanes. Park Avenue runs perpendicular to Stone Avenue and connects downtown Laurel Springs to Lindenwold and is the main north-south throughfare in Laurel Springs.</p>

Table 4: Municipal Priorities (continued)

Municipality	Priorities
Lindenwold Borough	The southern portion of Lindenwold is isolated. Bicycle lanes on Park Avenue (through Laurel Springs) and Laurel Road would allow bicyclists to access Lindenwold Station, as well as the rest of the borough. Connecting the dense apartment complexes east of Gibbsboro Road to the U.S. Avenue Trail would connect those residents to greater recreational opportunities.
Somerdale Borough	Bicycle lanes on Warwick Avenue would allow high school students to ride more safely as well as provide a connection to other municipalities. John F. Kennedy Boulevard, Crestwood Avenue, and Evergreen Avenue are three recommended routes that link to several local attractors. Safe bicycle passage on these roadways is important to promote greater bicycle usage.
Stratford Borough	Bicycle lanes on Warwick Avenue would provide safer access to both schools listed above, as well as provide better connectivity to neighboring municipalities. Vassar Avenue/Longwood Drive is an important north/south thoroughfare in the borough, and safe bicycle use on this segment should be a priority.
Voorhees Township	Bicycle lanes on Laurel Oak/Echelon Road would enable bicycle access to Voorhees Town Center and Laurel Oak Corporate Center as well as the bicycle lanes on Somerdale Road. Safe bicycle usage on recommended routes such as Dutchtown and Silver Hill Roads will enable users to connect to bicycle lanes on Centennial Boulevard and Cooper Road.

Source: DVRPC, 2008

While all of the proposed facilities in this report are important to the network, the priorities listed above are crucial segments that may be considered priorities. These segments were selected because they either connected with existing facilities or trails, facilitated access to important regional attractors, or improved general bicycle mobility through a municipality or the study area as a whole.

Implementation of the entire network is the desired outcome, but installing these facilities (or in some cases, ensuring that bicycle use is supported by road maintenance and enforcement of laws on motor vehicles) will permit new connections to be made via bicycle.

Costs and Funding

As the design and construction of the different facilities proposed in this plan are considered, the issue of project costs comes to the forefront. Building trails and striping bicycle lanes can be expensive, and having a strong mechanism for estimating costs of these facilities can assist in project prioritization as well as planning future additions to the network.

This chapter outlines the costs that may be incurred by implementing the different facilities that constitute this plan. The second part of the chapter highlights some potential funding sources that can be used on project design, engineering, and construction.

Cost Estimates

Table 5 compiles the total number of miles of proposed facilities that comprise the Central Camden County Bicycle Network. The mileage values of existing facilities are also included because maintenance is required to keep the facilities in a state of good repair.

Table 5: Total Miles of Existing and Proposed Facilities

Municipality	Ex. Lanes	Ex. Trails	Rec. Routes	Pro. Lanes	Pro. Trails	Connectors	Total
Berlin Bor.	0.00	0.93	3.68	1.95	2.79	1.51	10.86
Berlin Twp.	1.64	0.00	5.07	0.00	1.66	1.35	9.71
Clementon	0.00	0.00	3.13	1.95	2.84	0.73	8.65
Gibbsboro	0.00	2.95	3.05	3.22	2.06	1.46	12.74
Hi-Nella	0.27	0.00	0.23	0.00	1.20	0.27	1.97
Laurel Springs	0.39	0.00	1.08	0.00	0.15	0.04	1.65
Lindenwold	1.45	1.33	6.12	4.15	3.50	3.78	20.34
Somerdale	0.64	0.00	2.63	1.94	1.62	0.84	7.68
Stratford	0.02	0.00	2.47	1.49	1.77	0.47	6.21
Voorhees	8.31	0.60	5.68	5.57	4.95	1.70	26.82
Total	12.70	5.82	33.15	20.27	22.55	12.14	106.62

Source: DVRPC, 2008

As evidenced in Table 5, there are approximately 106 miles of existing and proposed facilities outlined in this plan. Roughly 17 percent of these facilities are currently in place. The plan proposes 33 miles of recommended bicycle routes, or those on-road segments where only signage is required. This accounts for over 30 percent of the entire network. There are also 20 miles of bicycle lanes, 22 miles of multi-use trails, as well as 12 miles of off-road connectors proposed in this plan.

The cost of different on- and off-road bicycle facilities can vary greatly. All bicycle facilities, both on- and off-road are vulnerable to variations in location, materials, and length. The long-term nature of this network also makes it difficult to estimate implementation costs. General cost estimates for the different proposed facilities are:

▶ Recommended Routes

Recommended routes do not require any type of engineering or design work. They do, however, require signage and routine maintenance to ensure safe passage for cyclists. The cost of the bicycle signs depend on the frequency of the signs as well as whether or not they will feature some level of wayfinding information. The Institute of Transportation Engineers estimates that traditional bicycle signs cost roughly \$200 per sign. The cost of planning and producing a specialized sign system is estimated to be \$85,000, but ostensibly that would cover not only the Recommended Routes but the signage on all facilities as well. Network signs would have to be complemented by more traditional signage to ensure legibility.

▶ Bicycle Lanes

The Pedestrian and Bicycle Information Center (PBIC) estimates the cost of bicycle lanes as between \$5,000 and \$50,000 per mile. This discrepancy is largely due to variations in lane location as well as the level of work required to stripe the lanes. It is most cost efficient to create bicycle lanes during street reconstruction, street resurfacing, or at the time of original construction. As there are roughly 20 miles of bicycle lanes proposed in this report, the estimated cost, according to 2009 figures would be between \$100,000 and \$1,000,000. However, as many of the roads recommended for striping are county roads, Camden County could assist the municipalities in this process.

▶ Multi-Use Trails and Connectors

Off-road trails are the most expensive component of this plan. A variety of factors can influence costs. These include land acquisition, length, location, materials, as well as the amount of work that needs to be done to make the trail secure for cyclists and pedestrians. As some of the proposed trail alignments are located adjacent to protected lands, it will be necessary to ensure that trail users don't encroach on these sensitive areas. According to the Pedestrian and Bicycle Information Center, per mile costs of off-road multi-use trails can run between \$40,000 for a soft-surface trail to more than \$1,000,000 for a paved trail in an urban environment. With roughly 22 miles of multi-use trails proposed in this plan, costs could run anywhere from \$1,000,000 to over \$20,000,000. Camden County must take the lead on assembling the money necessary to build these trails, but the municipalities will be important, particularly when land acquisition is involved.

Connectors are also off-road facilities, but estimating their costs may not be possible. Some of the proposed connectors are on public lands, but others are located on what is currently private property and acquisition and inclusion in this network might not be possible. The connectors proposed in this plan are conceptual, and if there is a location adjacent to the recommended connector which completes the same link, it should be considered as a possible alternative, particularly if it is the less expensive or complicated option.

The costs outlined above are estimates based on present-day figures. As different facilities are added to the network, a clearer picture of the long-term costs of implementing this plan will come into focus. The costs do not include routine maintenance of the facilities.

Funding Streams

While the costs of implementing a plan of this breadth can be quite intimidating, there are a number of potential funding sources that can help in the design and construction of the projects. This section details several of those sources and who is eligible to receive the funding.

The major sources of funds for the projects in the region's Transportation Improvement Program (TIP) are the United States Department of Transportation's Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA). In addition, monies are made available by the state of New Jersey to match federal funding in varying ratios, or to provide 100 percent financing for selected projects on the state highway systems. Counties, municipalities, and private developers or toll authorities, as well as transit operators, may also participate in providing matching funds for federal aid. Federal funding programs for which bicycle facilities are explicitly made eligible are described below.

▶ National Highway System (NHS)

NHS is a federal highway designation that provides separate funding and oversight for an interconnected system of major roads. This system serves population centers, ports, airports, public transportation, and other intermodal facilities. The construction of bicycle facilities within NHS rights-of-way, interstate highways included, is explicitly stated as eligible for funding under this program. (lead agency: NJDOT).

▶ Surface Transportation Program (STP)

STP is a block grant program that may be used for many types of transportation projects. Projects on roads functionally classified as local or rural minor collector are ineligible for funding under this program. Of the STP funds apportioned to a state, 10 percent must be set aside for safety

construction activities, another 10 percent set aside for transportation enhancements (TE; see below), and 30 percent can be used in any area of the state. (lead agency: NJDOT)

▶ Transportation Enhancements (TE)

TE programs are charged with more creatively integrating transportation facilities into their surrounding communities and natural environment. The program focuses on activities that go beyond the typical elements of a transportation improvement project. Each year many worthwhile projects compete for a limited pool of funds. The majority of projects funded under TE have been facilities for pedestrians and bicycles, although eligible activities include acquisition of scenic easements and scenic or historic sites, scenic or historic highway programs, landscaping or other scenic beautification, historic preservation, rehabilitation and operation of historic transportation buildings, structures, or facilities; preservation of abandoned railway corridors; control and removal of outdoor advertising; archaeological planning and research; and mitigation of water pollution due to highway runoff. The range of eligible TE activities is now expanded to include the provision of safety and educational activities for pedestrians and bicyclists, in addition to tourist and welcome centers, transportation museums, and environmental mitigation of vehicle-caused wildlife mortality. (lead agency: DVRPC)

▶ The Congestion Mitigation and Air Quality (CMAQ) Improvement Program

CMAQ provides funding for transportation control measures and other projects that will improve air quality and contribute to the attainment of the Clean Air Act standards by reducing highway source emissions. (lead agency: DVRPC).

▶ Hazard Elimination Program (Section 1112)

Bicycling and walking hazards are now specifically included in the list of eligible activities for this program. In addition, the definition of a public road now includes a publicly owned bicycle or pedestrian pathway or trail and traffic calming measures. (lead agency: NJDOT).

▶ Transit Enhancement Activity (Section 3003)

This new funding program, created with a one percent set-aside of Urban Area Formula transit grants (Section 3007) can be used for, among other things, bicycle and pedestrian access to mass transportation, including bicycle carriage facilities on buses and trains, and storage facilities at stations and bus stops. (lead agency: NJDOT).

- ▶ Cross County Connection Transportation Management Association (CCCTMA) TDM Reimbursements

This program makes available monies to member organizations to reward them for expanding their use of Transportation Demand Management (TDM) strategies . This money can be used for the purchase and installation of pedestrian and bicycle-related enhancements such as bicycle racks, crosswalks to enhance safety and visibility, and other improvements. (lead agency: CCCTMA)

Bicycle and pedestrian projects are eligible for other funds, including scenic byways, bridge, transit, safety (non-construction), and federal lands programs. There are also some non-federal programs that supply smaller grants to the planning and design of bicycle facilities. These include Bikes Belong grants and the Kodak American Greenway Awards.

Conclusion

This report outlines plans for implementing a comprehensive bicycle and multi-use trail network throughout 10 municipalities in central Camden County, New Jersey. The plan includes both on- and off-road facilities, and pays particular attention to increasing mobility throughout the study area so that area residents have the option of walking and bicycling to work, school, and other local destinations.

Through a series of workshops with regional stakeholders, existing facilities were inventoried, potential off-road alignments were selected and a set of regional attractors were chosen. The local road network was evaluated to determine where bicycle lanes would be appropriate as well as what local roads should be included in the plan without the presence of striping. Figure 3 depicts the entire network as agreed upon by the regional stakeholders. Appendix A contains inventories of all network facilities. Appendix B contains maps of all 10 municipalities with their network segments and attractors.

Chapter 5 presents a set of network-wide recommendations that include design standards for the various types of facilities as well as recommendations for encouraging bicycling and walking throughout the study area. While the individual municipalities will be responsible (along with Camden County) for the network within their boundaries, facility standards should be consistent throughout the municipalities, as should network signage and bicycle parking requirements. Chapter 6 deals with the estimated costs of implementing the network. Costs of bicycle and multi-use trail facilities vary greatly due to a number of factors, which makes it difficult to determine potential costs. Potential sources for funding were also discussed in that chapter.

Implementing this network will increase transportation options as well as the number of people who walk and bicycle as routine means of transportation. It will connect residential areas to regional destinations, and allow for greater access to the parks and recreational opportunities that exist throughout the study area. It will also promote regional cooperation, as neighboring municipalities work together to create uniform signage and clear standards for trail design.

This network will not be built in a day. Moving the Central Camden County Bicycle Network outlined in this report beyond a set of recommendations will take a coordinated effort from both public and private interests, as well as residents of the study area municipalities who commit to using and maintaining the facilities. The implementation of a full network that is accessible to users of all levels would require cooperation between the municipalities and with county officials, environmental groups, and residents of the various municipalities involved in this study.

APPENDIX A

Inventory of Network Facilities

The Central Camden County Bicycle and Multi-Use Trail
Network Master Plan



Inventory of Network Facilities

Appendix A includes inventories of all of the facilities that comprise the Central Camden County Bicycle and Multi-Use Trail Network Master Plan. As noted in Chapter 2, there are six different classifications of facilities that are being used to create this network. There are existing bicycle lanes, existing multi-use trails; proposed bicycle lanes; proposed multi-use trails; connectors; and recommended bicycle routes.

Each facility has been given a 'Map ID' that is used to identify the facility on the municipal maps located in Appendix B. The lengths (in yards) indicated in the following tables refer to the entire length of the facility. Facilities that traverse municipal boundaries should be maintained by both of these municipalities equally. The column 'MCD' refers to the location where each specific facility is located. Table A-1 lists the letters used to represent the municipalities in the different facility tables.

Table A-1: Municipal Locator Codes

Municipality	Code
Berlin Borough	A
Berlin Township	B
Clementon	C
Gibbsboro	D
Hi-Nella	E
Laurel Springs	F
Lindenwold	G
Somerdale	H
Stratford	I
Voorhees	J

Source: DVRPC, 2008

The following tables list each of the individual facilities that comprise the Central Camden County Bicycle and Multi-Use Trail Network. There are six facility types, as described in Chapter 2. Each individual facility has been given a unique identifier so plan users can easily determine which facilities are located in each municipality. The facilities are labeled with this identifier on the municipal maps that follow. As previously noted, if a particular facility is deemed infeasible, alternative routings should be considered.

Existing Bicycle Lanes

Table A-2 indicates the road segments in the study area that currently have bicycle lanes. Each of these existing bicycle lanes are labeled with an 'EL' for 'existing lane followed by a number identifier. They are labeled on the municipal maps that follow in Appendix B.

Table A-2: Existing Bicycle Lanes

Map ID	Facility Name/Location	MCD	Length (yards)
EL1	Berlin Road	G	1,224
EL2	Centennial Boulevard	J	2,883
EL3	Cooper Road	I	1,132
EL4	East Atlantic Avenue	H	1,449
EL5	Egg Harbor Road	G	1,368
EL6	Kresson Road	I	2,304
EL7	Lucas Lane	I	2,227
EL8	Somerdale Road	I	3,496
EL9	Victor Boulevard	I	878
Total Yards			16,960
Total Miles			9.6

In total there are approximately 10 miles bicycle lanes already in the study area. Many of these are located in Voorhees Township, which already has a large on-road bicycle network in place.

Existing Trails

Table A-3 (on the following page) lists the total number of off-road trail segments currently in the study area. These segments are labeled with 'ET' for existing trail following by a number identifier and are referenced in the maps below.

Table A-3: Existing Multi-Use Trails

Map ID	Name	MCD	Length (yards)
ET1	Berlin Park Bike Path	A	1,643
ET2	Berlin Road Sidepath	I	1,033
ET3	Gibbsboro Brown Route	D	1,132
ET4	Green Briar Bikeway (Gibbsboro Red Route)	D	1,305
ET5	Old Egg Harbor Bikeway A	D	875
ET6	Old Egg Harbor Bikeway B	D	1,064
ET7	Stacks Road Bikeway (Gibbsboro Red Route)	D	432
ET8	U.S. Avenue Trail	G, J	3,252
ET9	White Sands Branch Bikeway	D	861
Total Yards			11,598
Total Miles			6.6

Source: DVRPC, 2008

There are already almost 7 miles of off-road trails located in the plan's study area. Gibbsboro, in particular, has a well-developed network of off-road bicycle facilities in place. Some of these trails are located along existing greenway while others are located along roadways.

Proposed Bicycle Lanes

Table A-4 (on the following page) lists the road segments that are appropriate for on-road bicycle lanes. These segments are labeled 'PL' and can be found on the municipal maps below. This plan proposes adding over 27 miles of bicycle lanes to aid in the completion of the network. This will require a partnership with Camden County, as well as with municipalities that share a striped road segment.

Table A-4: Proposed Bicycle Lanes

Map ID	Name	MCD	Length (yards)
PL1	Chews Landing Road	C,G	3,082
PL2	East Gibbsboro Road	D,G	5,839
PL3	Echelon Road	I,J	4,398
PL4	Erial Road/Gibbsboro Road	C	1,508
PL5	Evesham Avenue	I	4,469
PL6	Executive Drive	J	603
PL7	Franklin Avenue	B	1,243
PL8	Haddonfield-Berlin Road	B	1,635
PL9	Kirkwood-Gibbsboro Road	D,J	3,324
PL10	Laurel Road	J	825
PL11	Laurel Road	I	3,288
PL12	New Freedom Road	A	2,013
PL13	Somerdale Road	H,J	1,658
PL14	South Burnt Mill Road	I	1,472
PL15	Tansboro Road	A	1,876
PL16	Voorhees Drive	J	860
PL17	Warwick-Stone Road	H,I,E	4,830
PL18	West Park Avenue	G	1,030
PL19	West Somerdale Avenue	H	3,036
PL20	White Horse Avenue	C	1,326
Total Yards			48,316
Total Miles			27.5

Source: DVRPC, 2008

Proposed Trails

Table A-5 lists the off-road trail segments proposed in the plan. These segments are labeled with 'PT' and can be seen on the maps that follow.

This plan proposes approximately 35 miles of additional off-road facilities throughout the study area. Some of these are located along greenways proposed in the county's open space plan. Other facilities are located along roadways where bicycle lanes are not feasible, but where some space exists to construct multi-use paths.

Table A-5: Proposed Multi-Use Trails

Map ID	Name/Location	Length (yards)
PT1	Audobon Branch Trail	981
PT2	Clementon Open Space	967
PT3	Cooper River Trail (Eastern Terminus)	1,240
PT4	Cooper River Trail (Kirkwood Branch)	1,661
PT5	Cooper River Trail (South Branch)	4,449
PT6	East Atlantic Avenue Trail	4,132
PT7	Gibbsboro Red Route Extension	844
PT8	Haddonfield-Berlin Road Sidepath A	1,031
PT9	Haddonfield-Berlin Road Sidepath B	4,122
PT10	Hilliards Creek	718
PT11	Hilliards Creek	907
PT12	Laurel Lake Branch Trail	1,307
PT13	Laurel Ravine	11,842
PT14	Nicholson Branch Trail	1,107
PT15	Rail-with-Trail - Atlantic City Line	2,083
PT16	River to Bay Greenway	10,992
PT17	River to Bay Greenway (Northern Segment)	4,457
PT18	Twin Lakes Trail	2,054
PT19	Utility Line Right-of-Way	6,535
Total Yards		61,428
Total Miles		34.9

Source: DVRPC, 2008

Connectors

Table A-6 (on the following two pages) lists the connectors that are part of the Central Camden County Bicycle and Multi-Use Trails Master Plan. Connectors are short, off-road segments meant to connect residential pockets of the study to the network. If the connector already exists, it is noted in the table.

There are 14 miles of connectors involved in this plan, a small percentage of which currently exist. In some situations, easements may be needed to procure the right-of-way of certain proposed connectors. If acquisition of this easement is impossible, or if one of the proposed connectors proves too expensive to construct, then it is recommended that alternate routings be considered.

Table A-6: Connectors

Map ID	Name	MCD	Length (yards)
CO1	Almond Avenue to New Road	I	871
CO2	Apartment City to Brand Avenue	C	261
CO3	Apartment City to Lindenwold Sports Complex	G	102
CO4	Apartment City to Lindenwold Sports Complex	G	73
CO5	Apartment City to Success Drive	G	397
CO6	Apartment Complex to Irving Street	G	126
CO7	Apartment Complex to Trent Court	G	43
CO8	Atlantic Avenue	E	242
CO9	Berlin Community Center (existing)	A	494
CO10	Bridgewood Lake Bikeway (partially existing)	D	336
CO11	Bryant Avenue to Berlin Road	G	202
CO12	Canyon Drive to Berlin Community School (existing)	A	78
CO13	Cardinal Lane to Route 73	J	286
CO14	Carriage Stop Drive	A	666
CO15	Cedar Avenue	G	305
CO16	Chatham Drive	G	30
CO17	Chews Landing Road to Lindenwold Gardens	G	530
CO18	Clementon Silver Lake Bike Path	C	447
CO19	Commerce Lane to Stratford Avenue	B	155
CO20	Cooper Road	B	148
CO21	Cornell Avenue	H	109
CO22	Crestwood Avenue	H	163
CO23	Cross Keys Road to Berlin Park	A	79
CO24	Echelon/Lindenwold Station Bridge	G,J	276
CO25	Eisenhower School	B	39
CO26	Elizabeth Avenue to Holly Street	G	196
CO27	Evesham Avenue	H	231
CO28	Evesham Avenue to West End Avenue	H	201
CO29	Franklin Avenue to Park Boulevard	A	1,211
CO30	Gibbsboro Connector	D	395
CO31	Grant Avenue	H	128
CO32	Haddon Avenue to Walker Avenue	B	667
CO33	Haines Point to Victor Boulevard	J	95
CO34	Hamilton Elementary School (existing)	J	394
CO35	Hilliards Creek	D	404
CO36	Hopewell Road to Lindenwold Station	B	352
CO37	Hummingbird Lane	J	661
CO38	Industrial Drive	B	122
CO39	Informal Pathway Between Apartment Complex	G	85
CO40	Irving Street	G	13
CO41	Irving Street to Gibbsboro Road	G	548
CO42	Katherine Avenue	B	325
CO43	Kelly Drive	B	249
CO44	Kresson Road	J	364

Table A-6: Connectors (continued)

Map ID	Name	MCD	Length (yards)
CO45	Lafayette Avenue to Mt. Vernon Avenue	B	331
CO46	Laurel Lake Bridge	F	357
CO47	Linden Avenue	H	230
CO48	Lindenwold Elementary School	G	170
CO49	Lindenwold Park	G	646
CO50	Oak Lane to White Horse Pike	C	477
CO51	Old Egg Harbor Road to Haines Point	D,J	445
CO52	Orchard Avenue	I	578
CO53	Penn Road to Juschase Court (existing)	J	46
CO54	Pinelawn Avenue	C	175
CO55	Preston Avenue	J	326
CO56	Prospect Avenue	J	42
CO57	Roberts Avenue	C	79
CO58	Route 73	B	30
CO59	Royalty Lane	I	468
CO60	Scoles Avenue to Chews Landing Road	G	225
CO61	Scott Avenue to West Park Avenue	C	256
CO62	Seventh Avenue to Laurel Oak Corporate Center (existing)	J	42
CO63	Signey Lane	I	229
CO64	Silver Lake Park	C	107
CO65	South Atlantic Avenue	A	378
CO66	Sterling High School	I	428
CO67	Sycamore Avenue	I	473
CO68	Troth Avenue (existing)	D,J	937
CO69	Twin Lakes	C	1,211
CO70	Wallace Avenue	C,G	547
CO71	Walnut Avenue	I	238
CO72	Westbury Drive to Franklin Avenue	A	161
CO73	White Horse Avenue to East Atlantic Avenue	G	366
CO74	White Horse Road to Pine Avenue	J	227
CO75	Whittier Avenue to Norcross Road	D,G	148
CO76	Windham Avenue	G	161
CO77	Woodhurst Drive to Northgate Drive (existing)	J	215
CO78	Woodland Lake	D	379
Total Yards			24,226
Total Miles			13.8

Source: DVRPC, 2008

Recommended Routes

Table A-7 lists the Recommended Routes in this plan. Recommended Routes are on-road segments that are comfortable for bicycle use without the aid of striping. Some of the individual facilities represent specific routings between destinations that may be more attractive to cyclists. There are approximately 34 miles of Recommended Routes involved in this plan.

Table A-7: Recommended Routes

Map ID	Name	MCD	Length (yards)
RR1	Apartment City to Clementon Center via White Horse Pike and Silver Lake	G	274
RR2	Apartment City to Lindenwold Sports Complex	G	1,210
RR3	Audobon Avenue-Clementon Elementary School	C	315
RR4	Berlin Center to Atco Station via Jackson Road	A,B	2,809
RR5	Berlin Center to Industrial Park	A,B	3,207
RR6	Blackwood-Clementon Road Crossing	C	391
RR7	Braddock Mill Road	J	448
RR8	Bradford Way	J	383
RR9	Bronwood Drive	J	1,431
RR10	Clementon Lake to Lake Lekau via East Atlantic Avenue	C	2,423
RR11	Clementon Road to Cross Keys Road via Park Boulevard	A,B	1,520
RR12	Clinton Avenue to Bethel Avenue	B	840
RR13	Commerce Lane	B	1,099
RR14	Cottage Avenue to Georgetown Road	G	1,703
RR15	Crestwood Avenue to Kennedy Boulevard	H	1,842
RR16	Cuthbert Drive	G	1,316
RR17	Dobbs Drive to West Atlantic Avenue	E,I	468
RR18	Dutchtown Road	I	2,546
RR19	East Atlantic Avenue Trail to South Branch Trail	H,I	864
RR20	East Linden Avenue	G	1,953
RR21	Eastwick Drive	D	122
RR22	Evergreen Avenue	H	1,049
RR23	Foster Avenue to Alton Avenue via U.S Avenue	D	954
RR24	Franklin Avenue	A,B	2,238
RR25	Garfield Avenue	C	237
RR26	Hilliards Road to Norcross Road	D	897
RR27	Holly Avenue	D	207
RR28	Irving Street	G	430
RR29	Lake Boulevard	C	720
RR30	Lake Boulevard to Wallace Avenue	C	1,137
RR31	Lakeside Drive to Signal Hill Drive	J	892
RR32	Laurel Lake to Cedar Avenue	F,G	1,402
RR33	Laurel Lake to Kennedy Hospital	F,G	1,459
RR34	Laurel Oak Corporate Center	J	235
RR35	Lehigh Avenue to Lindenwold Station	H	494

Table A-7: Recommended Routes (continued)

Map ID	Name	MCD	Length (yards)
RR36	Linden Avenue	H	208
RR37	Lindenwold Station	G	843
RR38	Minck Avenue to Berlin Shopping Plaza	B	686
RR39	Old Berlin Road	D	945
RR40	Old Egg Harbor Road	D	646
RR41	Old Haddon Avenue	D,J	1,196
RR42	Peregrine Drive to Partridge Drive	J	2,126
RR43	Pine Avenue	J	154
RR44	Pinedge Drive	B	683
RR45	Rosamond Avenue	G	1,111
RR46	Rutgers Boulevard	A,B	338
RR47	South Atlantic Avenue	A,B	157
RR48	South Atlantic Avenue II	A,B	153
RR49	Success Drive to Crowland Avenue	G	764
RR50	Van Horn Avenue	C	884
RR51	Wallace Avenue	C	262
RR52	Walnut Avenue	I	774
RR53	Warren Avenue to Patton Avenue	B	342
RR54	Warwick Road to White Horse Pike via Vassar Avenue	I	3,017
RR55	West Atlantic Avenue	H	111
RR56	West Berlin Route	B	2,219
RR57	West Park Avenue	G	668
RR58	West Road	D	868
RR59	Woodbrook Road to Concord Lane	I	754
Total Yards			59,425
Total Miles			33.8

Source: DVRPC, 2008

APPENDIX B

Municipal Maps and Attractors

The Central Camden County Bicycle and Multi-Use Trail
Network Master Plan



Municipal Maps and Attractors

While the larger purpose of the network is to create greater connectivity throughout Central Camden County, each municipality, in conjunction with Camden County, will be responsible for implementing and maintaining the network within its own borders. This section depicts the network in each of the 10 municipalities that make up the study area with each of the facilities identified. Not every municipality has each type of facility, and there is a wide-range in terms of the number of facilities that each municipality has.

Also included in this chapter are photographs of attractors and/or bicycle facilities in each of the 10 municipalities.

Berlin Borough

Berlin Borough is the third most populous and third largest municipality in the study area in terms of size. It is located at the southeastern corner of the study area and is bordered by Berlin Township to the north and Lindenwold Borough to the west. A map of the trail network in Berlin Borough is located on Figure B-1.

There are few existing facilities in Berlin Borough. Berlin Park Trail is the only designated multi-use trail in the borough, and there are no roadways currently equipped with bicycle lanes. Figure B-2 to the right depicts a photograph of this trail, which while attractive, does not provide access to any of the local attractors in Berlin Borough.

Figure B-2: Berlin Park Trail



Source: DVRPC, 2008

Figure B-3, below, depicts two of the attractors in Berlin Borough. On the left is Our Lady of Mt. Carmel School and on the right is Berlin Farmers Market. Other than the Farmer's market, which is somewhat accessible via the Berlin Park Trail, none of the other attractors are accessible by the existing bicycle network. Overall, the plan is proposing roughly four miles of recommended bicycle routes, two miles of bicycle lanes, three miles of potential trail, and two miles of connectors.

Figure B-3: Berlin Borough Attractors



Source: www.olmcp parish.net, 2008
















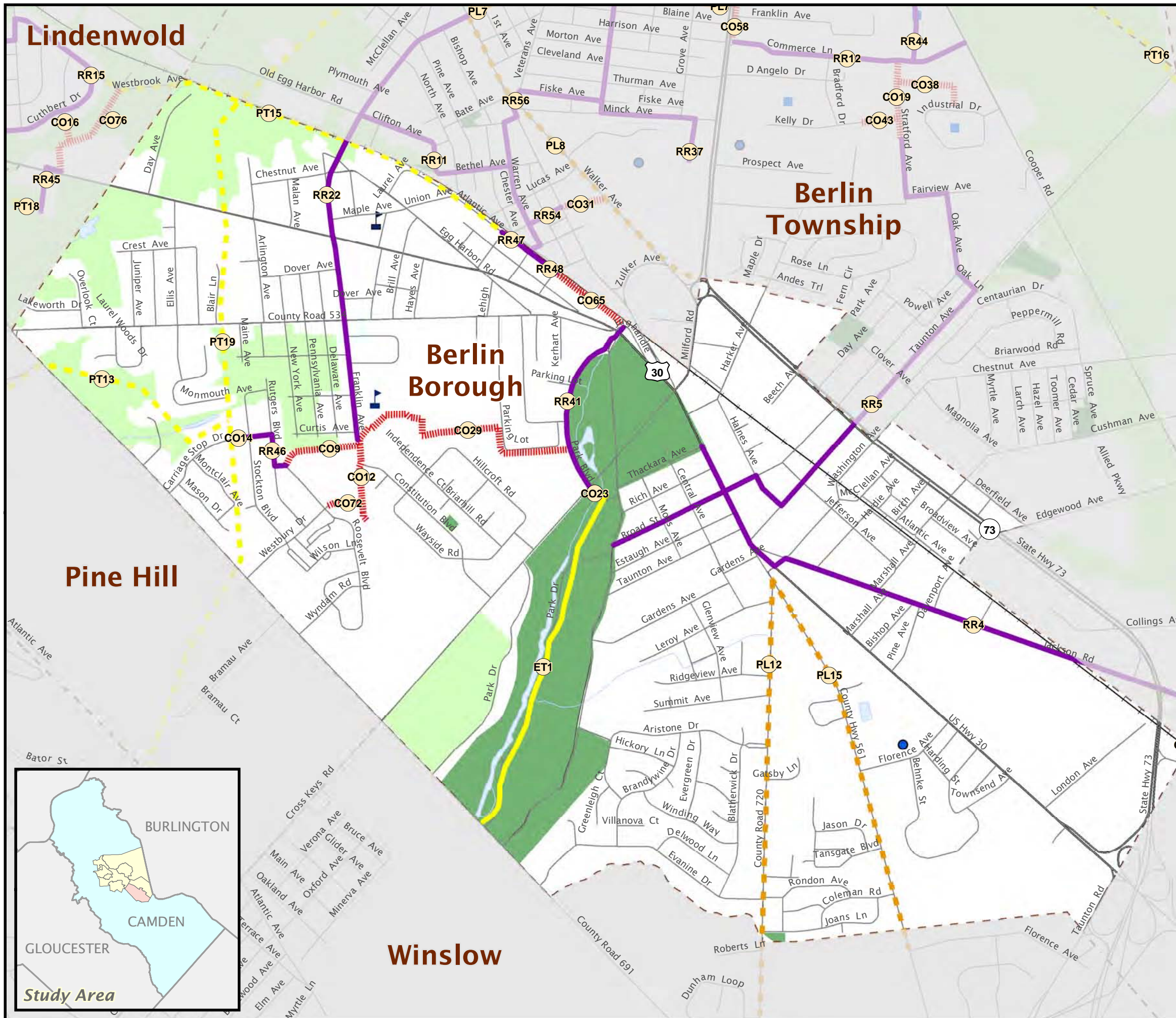
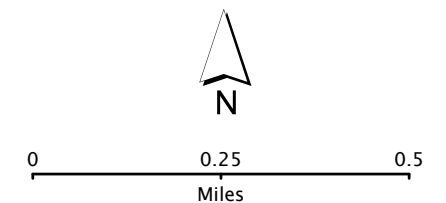
Source: DVRPC, 2008

Central Camden County Bicycle / Multi-Use Trail Network

Figure B-1.

Berlin Borough

-  Existing Bicycle Lane
-  Proposed Bicycle Lane
-  Existing Multi-Use Trail
-  Proposed Multi-Use Trail
-  Connector
-  Recommended Bicycle Route
-  Business Park
-  Shopping Center
-  School
-  Train Station
-  Park
-  Proposed Greenway
-  Network Facility (See Appendix A or B for details)



Berlin Township

Berlin Township is the fifth most populous and fourth largest of the municipalities in the study area. Figure B-4 on the following page depicts a map of the trail network and attractors in the township.

Currently there are no segments of the bicycle network in Berlin Township, so none of the attractors are accessible via bicycle. Implementing the bicycle network would connect to locations such as the local John F. Kennedy Elementary School located along Mt. Vernon Road and the Pinedge Corporate Center, located along Cooper Road, both shown in Figure B-5. The report is proposing five miles of recommended bicycle routes, just under two miles each of bicycle lanes and proposed trail, and under one and a half miles of connectors.

Figure B-5: Berlin Township Attractors



Source: DVRPC, 2008
















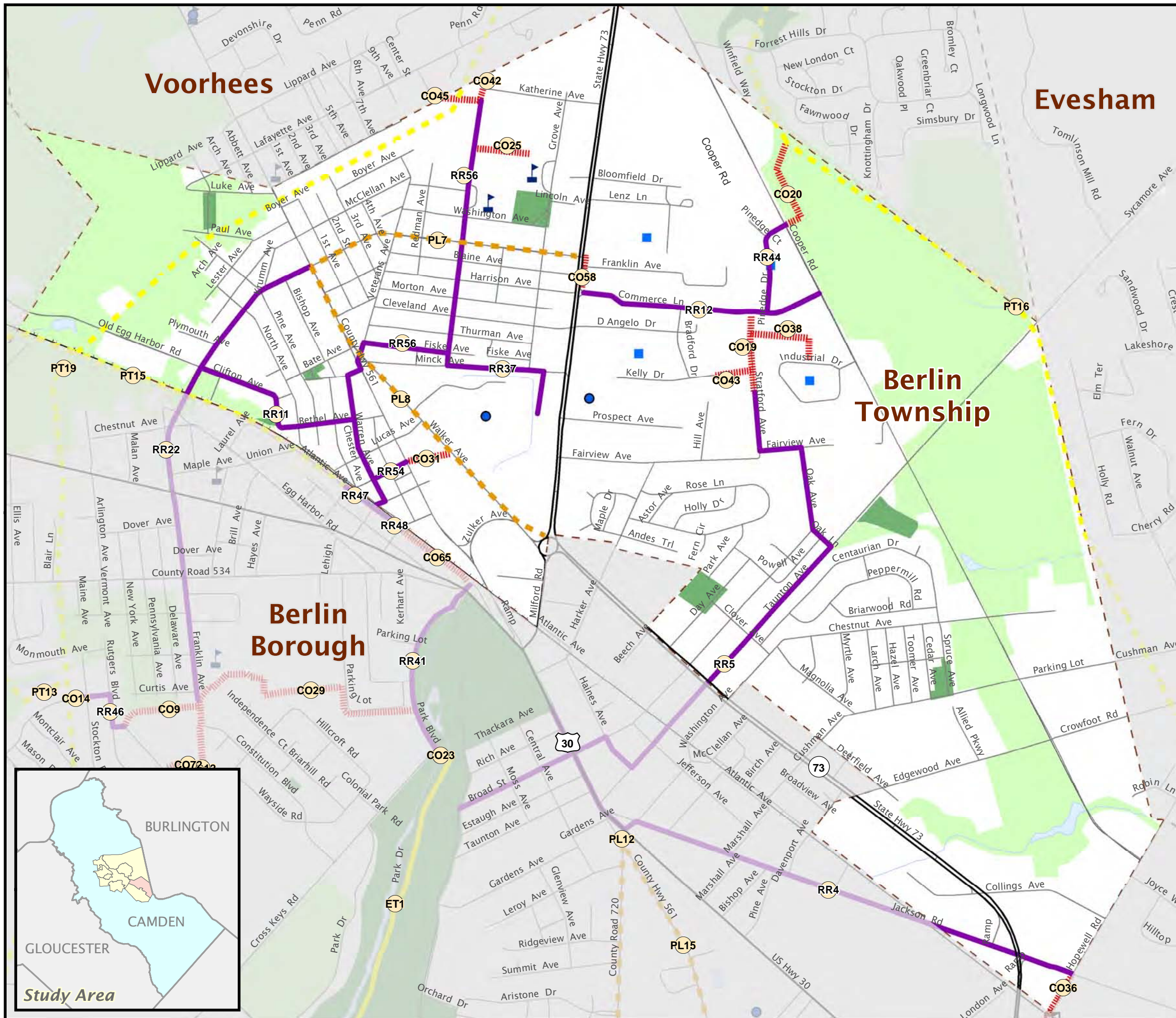
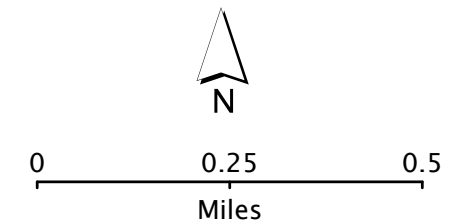
Source: www.loopnet.com, 2008

Central Camden County Bicycle / Multi-Use Trail Network

Figure B-4.

Berlin Township

-  Existing Bicycle Lane
-  Proposed Bicycle Lane
-  Existing Multi-Use Trail
-  Proposed Multi-Use Trail
-  Connector
-  Recommended Bicycle Route
-  Business Park
-  Shopping Center
-  School
-  Train Station
-  Park
-  Proposed Greenway
-  Network Facility (See Appendix A or B for details)



Clementon Borough

Clementon is the seventh most populous municipality and the sixth largest in terms of size in the study area. It is located in the central portion of the study area and is bordered by Lindenwold Borough to the north, west, and east. Route 30 traverses Clementon in the northeast part of the borough. Figure B-6 on the following page depicts the trail network within the borough, as well as Clementon's local attractors.

Clementon does not currently contain any existing facilities of the proposed bicycle network. The borough has many parks and several proposed greenways that traverse through the borough, but access to these parks are hindered by a lack of bicycle facilities. The Central Camden County Bicycle and Multi-Use Trail Plan is proposing roughly three miles of recommended bicycle routes, two miles of bicycle lanes, three miles of trails and less than one mile of connectors. Establishing the network inside Clementon would enable bicycle and pedestrian access to attractors such as Clementon Park and Clementon Elementary School, depicted in Figure B-7.

Figure B-7: Clementon Attractors



Source: DVRPC, 2008
















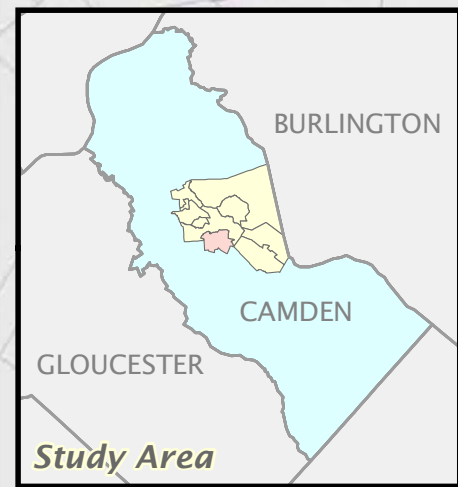
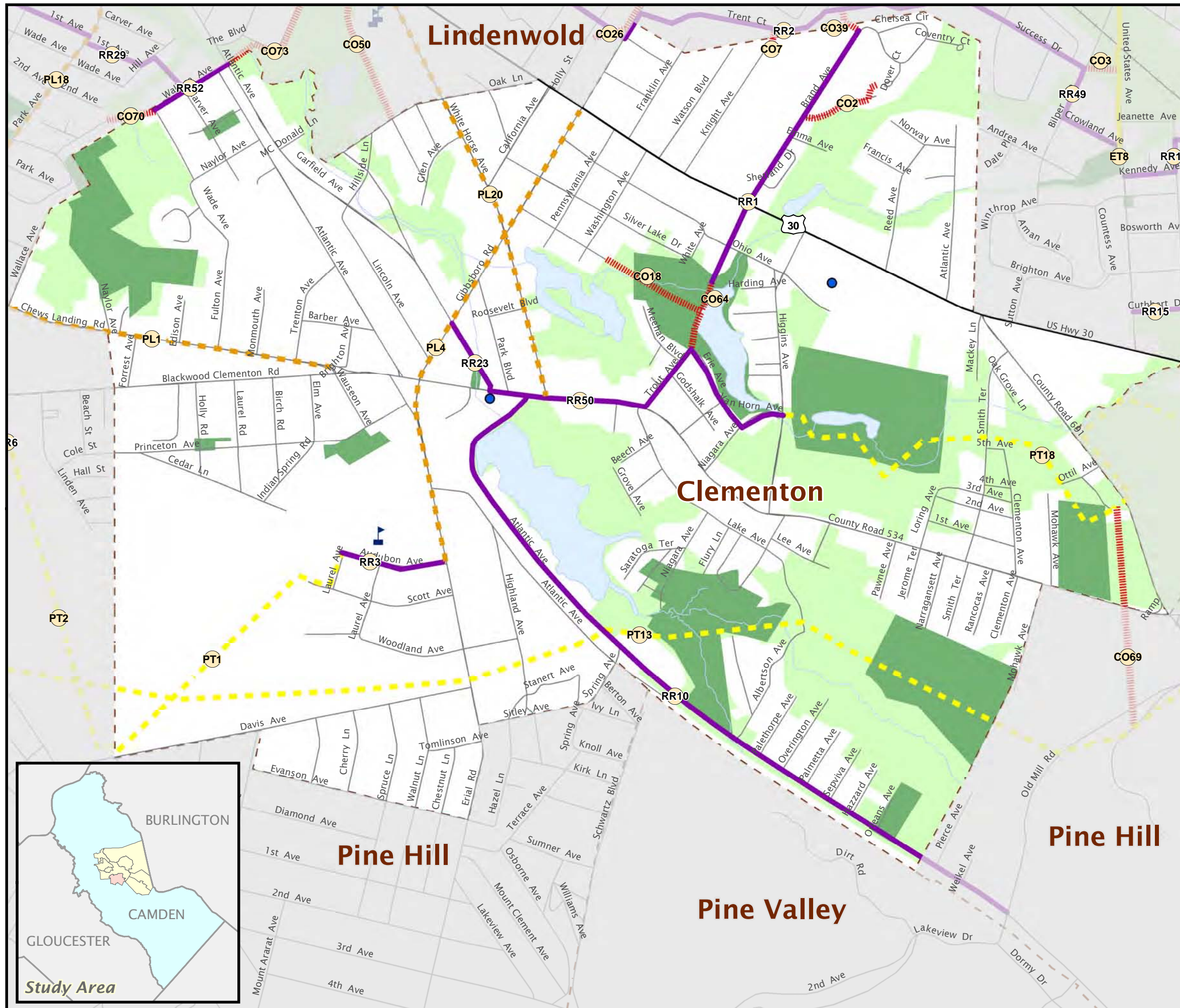
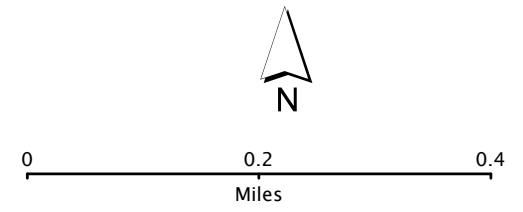
Source: www.clementonschool.org, 2008

Central Camden County Bicycle / Multi-Use Trail Network

Figure B-6.

Clementon

-  Existing Bicycle Lane
-  Proposed Bicycle Lane
-  Existing Multi-Use Trail
-  Proposed Multi-Use Trail
-  Connector
-  Recommended Bicycle Route
-  Business Park
-  Shopping Center
-  School
-  Train Station
-  Park
-  Proposed Greenway
-  Network Facility (See Appendix A or B for details)



Gibbsboro Borough

Gibbsboro is located in the central portion of the study area. It is the eighth most populous municipality in the study area, but the fifth largest in terms of size. It is bordered by Voorhees to the north, east, and west, and Lindenwold to the south. Large portions of Gibbsboro fall within a proposed greenway, and the borough has a well-developed set of trails and paths. The entire network in Gibbsboro is located in Figure B-8 on the following page

Figure B-9: Example of Gibbsboro Sidepath



Source: Photo courtesy of Mayor Ed Campbell, 2008

Gibbsboro Borough includes bikeway provisions in their development ordinance. These require the construction of bicycle pathways alongside new developments. Figure B-9 (left) depicts one of these bicycle paths along the newly built CVS Pharmacy. More of these paths will be added as parcels are developed, creating strong bicycle and pedestrian access to new local attractors. Gibbsboro, which has several proposed greenways traversing it, already has roughly three miles of multi-use trails.

The Paintworks Corporate Center, which is located roughly in the center of Gibbsboro is a primary attractor in the Borough. The Corporate Center, shown here in Figure B-10 is accessible via the bicycle network, and includes a large lake that has its own path.

Figure B-10: Gibbsboro Paint Works
















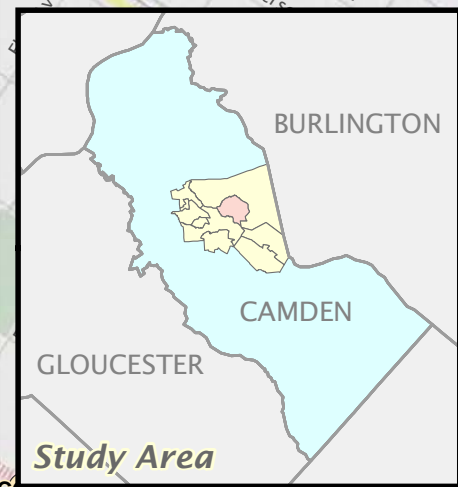
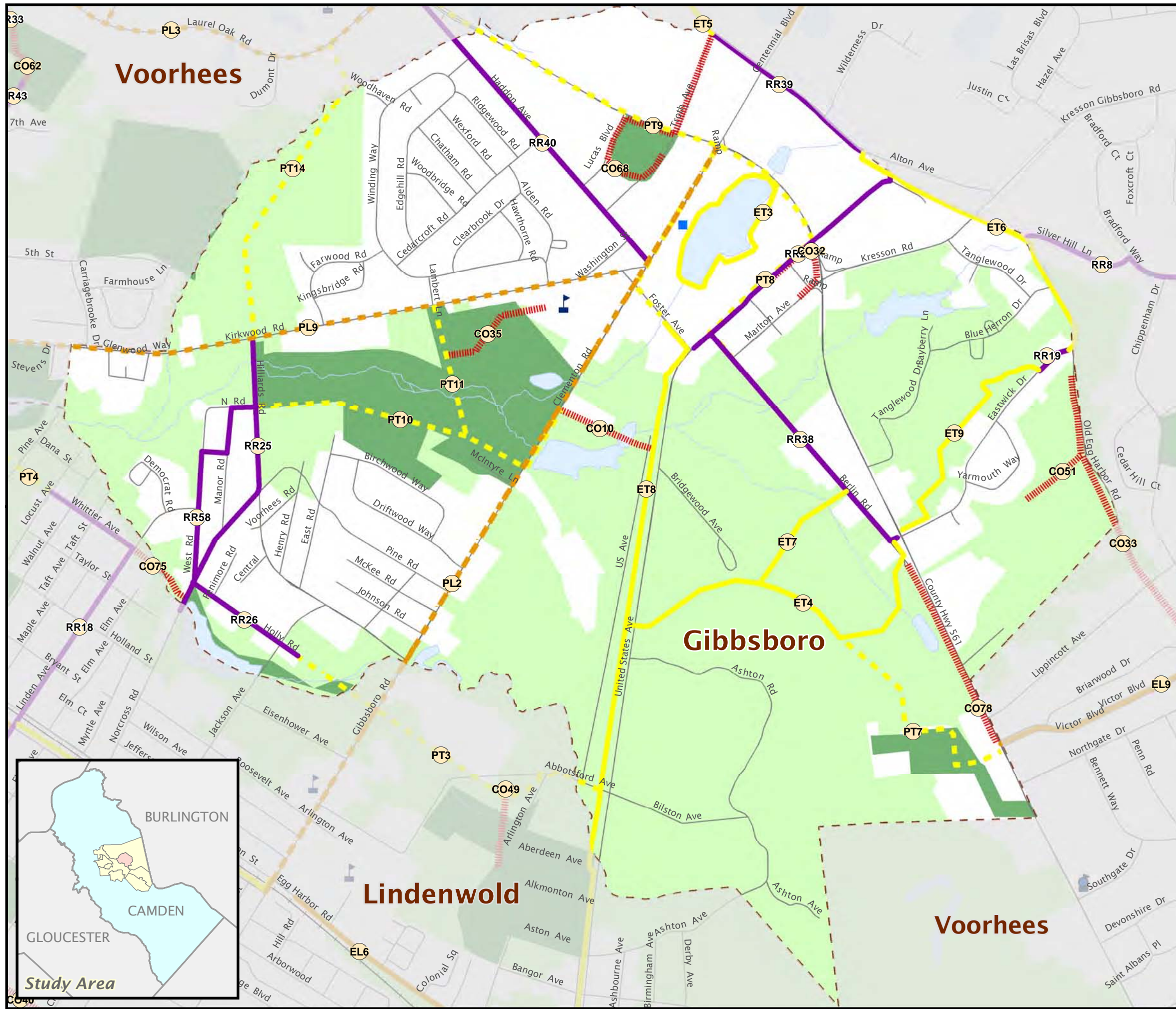
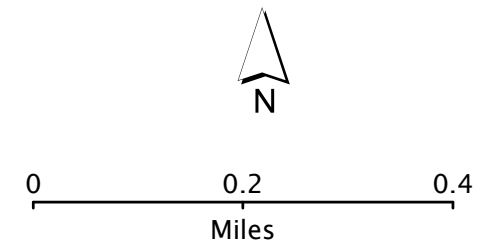
Source: www.njfilm.org, 2008

Central Camden County Bicycle / Multi-Use Trail Network

Figure B-8.

Gibbsboro

-  Existing Bicycle Lane
-  Proposed Bicycle Lane
-  Existing Multi-Use Trail
-  Proposed Multi-Use Trail
-  Connector
-  Recommended Bicycle Route
-  Business Park
-  Shopping Center
-  School
-  Train Station
-  Park
-  Proposed Greenway
-  Network Facility (See Appendix A or B for details)



Hi-Nella Borough

Hi-Nella Borough is the least populated and smallest municipality in the study area. It is located in the southwestern portion of the study area, bordered by Somerdale on the west and Stratford to the east. Figure B-11, on the following page, depicts the network facilities located in Hi-Nella.

None of the facilities proposed in this report currently exist in Hi-Nella. Also, due to its small size and absence of local schools, there are no local attractors located in the borough. This plan is proposing less than half a mile of recommended bicycle routes, and just over a mile of proposed trails in Hi-Nella. Figure B-12, below, depicts Atlantic Avenue in Hi-Nella. Several segments of Atlantic Avenue currently have bicycle lanes, but a trail has been proposed to run alongside the freight tracks.

Figure B-12: Atlantic Avenue, Hi-Nella

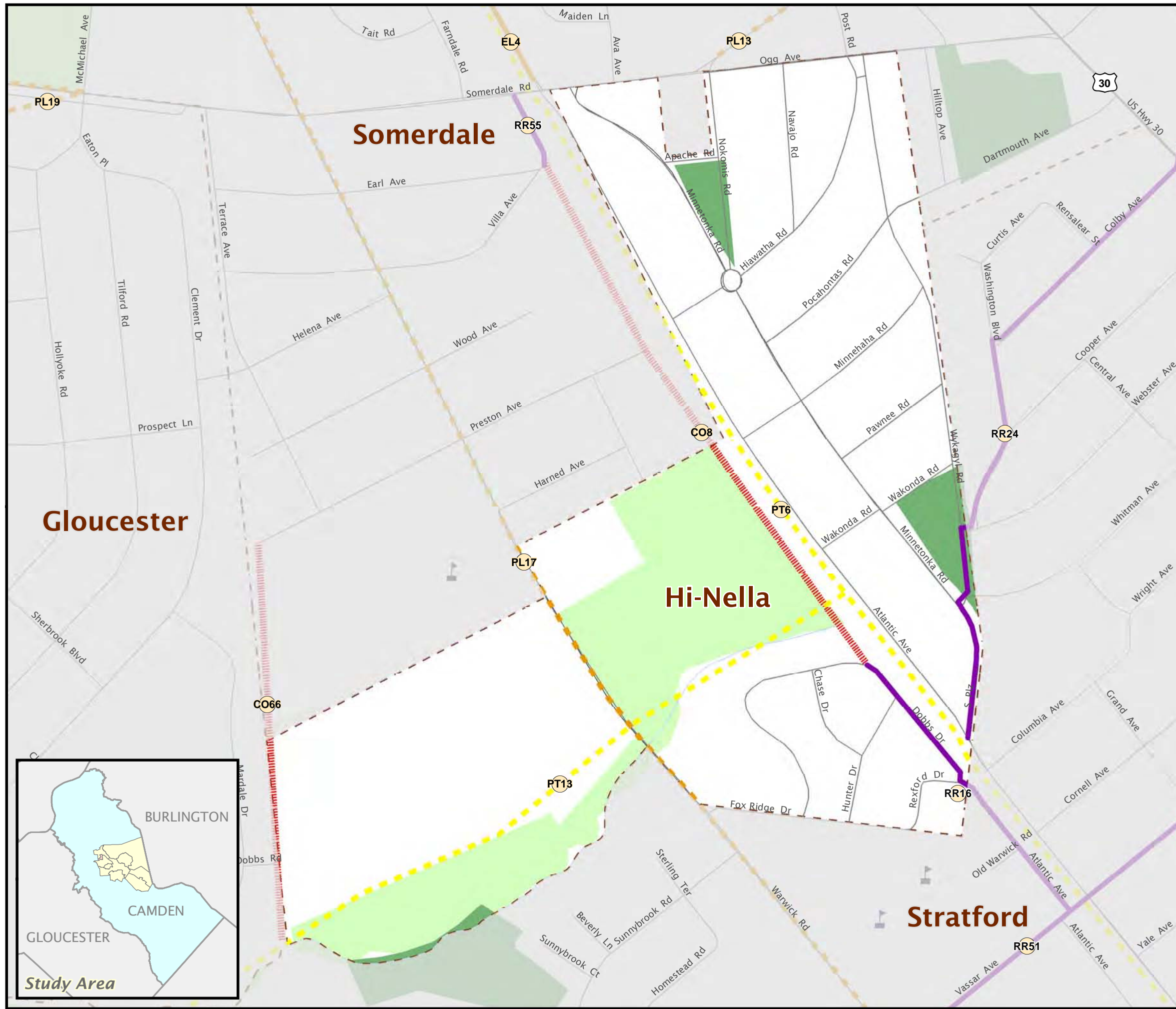
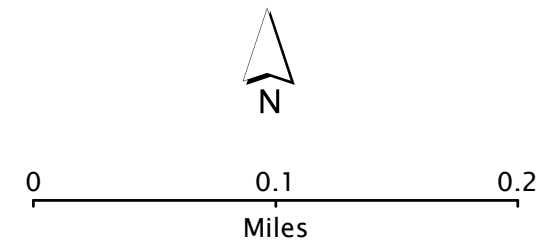


Source: DVRPC, 2008

Central Camden County Bicycle / Multi-Use Trail Network

Figure B-11.
Hi-Nella

- Existing Bicycle Lane
- Proposed Bicycle Lane
- Existing Multi-Use Trail
- Proposed Multi-Use Trail
- Connectors
- Recommended Bicycle Route
- Business Park
- Shopping Center
- School
- Train Station
- Park
- Proposed Greenway
- Network Facility (See Appendix A or B for details)



Laurel Springs Borough

Laurel Springs Borough is the ninth most populous and ninth largest municipality in the study area. It is bordered by Stratford to the west and Lindenwold to the south and east. Figure B-13 on the following page depicts the network facilities, as well as the local attractors in Laurel Springs.

Laurel Springs does not currently have any of the bicycle facilities proposed in this report. If implemented, the proposed network would link to two important attractions in Laurel Springs, shown here in Figure B-14. This report is proposing approximately one mile of recommended bicycle routes and less than a mile each of trails and connectors in Laurel Springs. On the left is downtown Laurel Springs, located at the confluence of Atlantic Avenue and Stone Avenue; and on the right is Laurel Springs Elementary School, located on Stone Road, locations that would be accessible via the bicycle and multi-use trail network.

Figure B-14: Laurel Springs Attractors



Source: DVRPC, 2008
















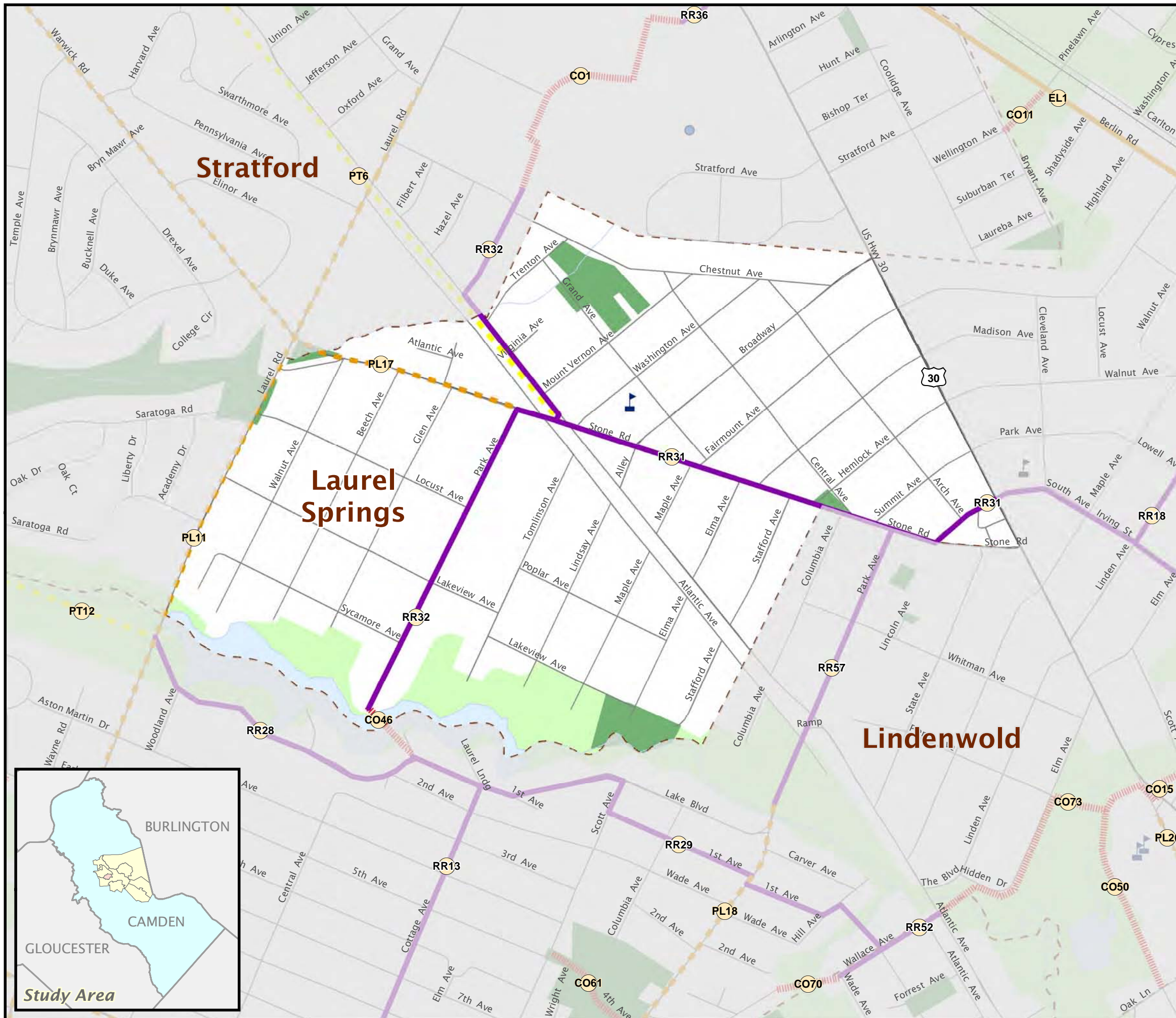
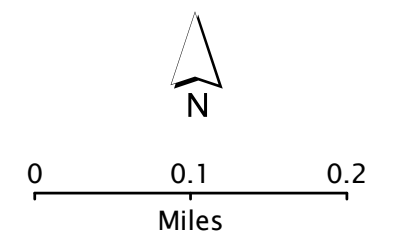
Source: DVRPC, 2008

Central Camden County Bicycle / Multi-Use Trail Network

Figure B-13.

Laurel Springs

-  Existing Bicycle Lane
-  Proposed Bicycle Lane
-  Existing Multi-Use Trail
-  Proposed Multi-Use Trail
-  Connector
-  Recommended Bicycle Route
-  Business Park
-  Shopping Center
-  School
-  Train Station
-  Park
-  Proposed Greenway
-  Network Facility (See Appendix A or B for details)



Lindenwold Borough

Lindenwold is the second most populous and second largest municipality in the study area. Located in the central portion of the study area, it is bordered by Laurel Springs on the west, Gibbsboro to the north, and Clementon to the east. Figure B-15 on the following page depicts these facilities, as well as some of Lindenwold's local attractors.

Lindenwold already has some bicycle facilities in place. There are bicycle lanes on Berlin Road and Old Egg Harbor Road linked by the Berlin Road Sidepath, and the U.S. Avenue Trail extends into Lindenwold from the north. There are many attractors, however, that are not served by these bicycle facilities. Two such attractors are Lindenwold Station, which is a stop on both the PATCO and New Jersey Transit Atlantic City Line, and Lindenwold High School, although there are several attractors located in the borough. Figure B-16 depicts these attractors.

Figure B-16: Lindenwold Attractors



Source: DVRPC, 2008







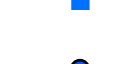








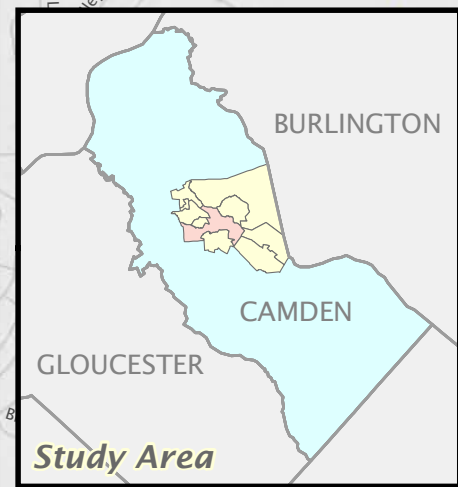
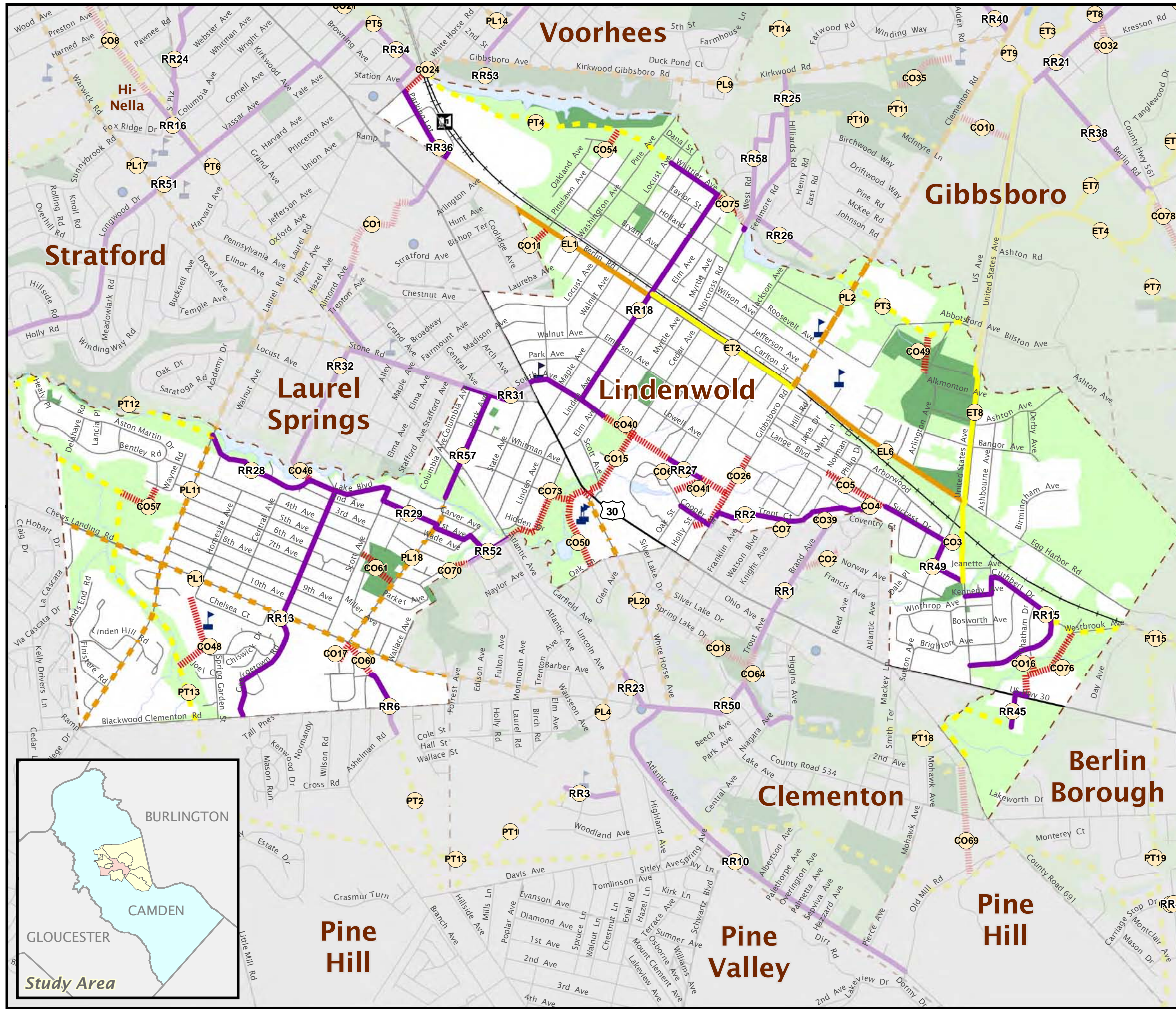
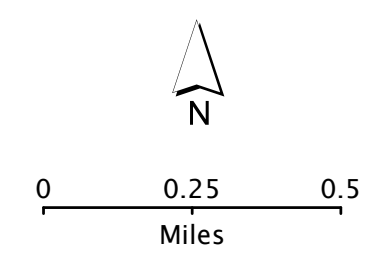
Source: www.southjersey.com, 2008

Central Camden County Bicycle / Multi-Use Trail Network

Figure B-15.

Lindenwold

-  Existing Bicycle Lane
-  Proposed Bicycle Lane
-  Existing Multi-Use Trail
-  Proposed Multi-Use Trail
-  Connector
-  Recommended Bicycle Route
-  Business Park
-  Shopping Center
-  School
-  Train Station
-  Park
-  Proposed Greenway
-  Network Facility (See Appendix A or B for details)



Somerdale Borough

Somerdale is located in the southwest corner of the study area and is bordered by Hi-Nella to the east and Voorhees to the north. It is the sixth most populous municipality, and the eighth largest. Figure B-17 on the following page depicts the network in the borough, as well as any local attractors.

The only bicycle facility currently in place in Somerdale is a bicycle lane on Atlantic Avenue. No multi-use trails are located in the borough, although two are proposed in this report. This report is proposing less than three miles of recommended bicycle routes, two miles of new bicycle lanes, just over one and a half miles of multi-use trails, and under a mile of connectors. Figure B-18, below, depicts Sterling High School, one of the attractors in Somerdale Borough that would be accessible if the bicycle network were implemented.

Figure B-18: Somerdale Attractors
















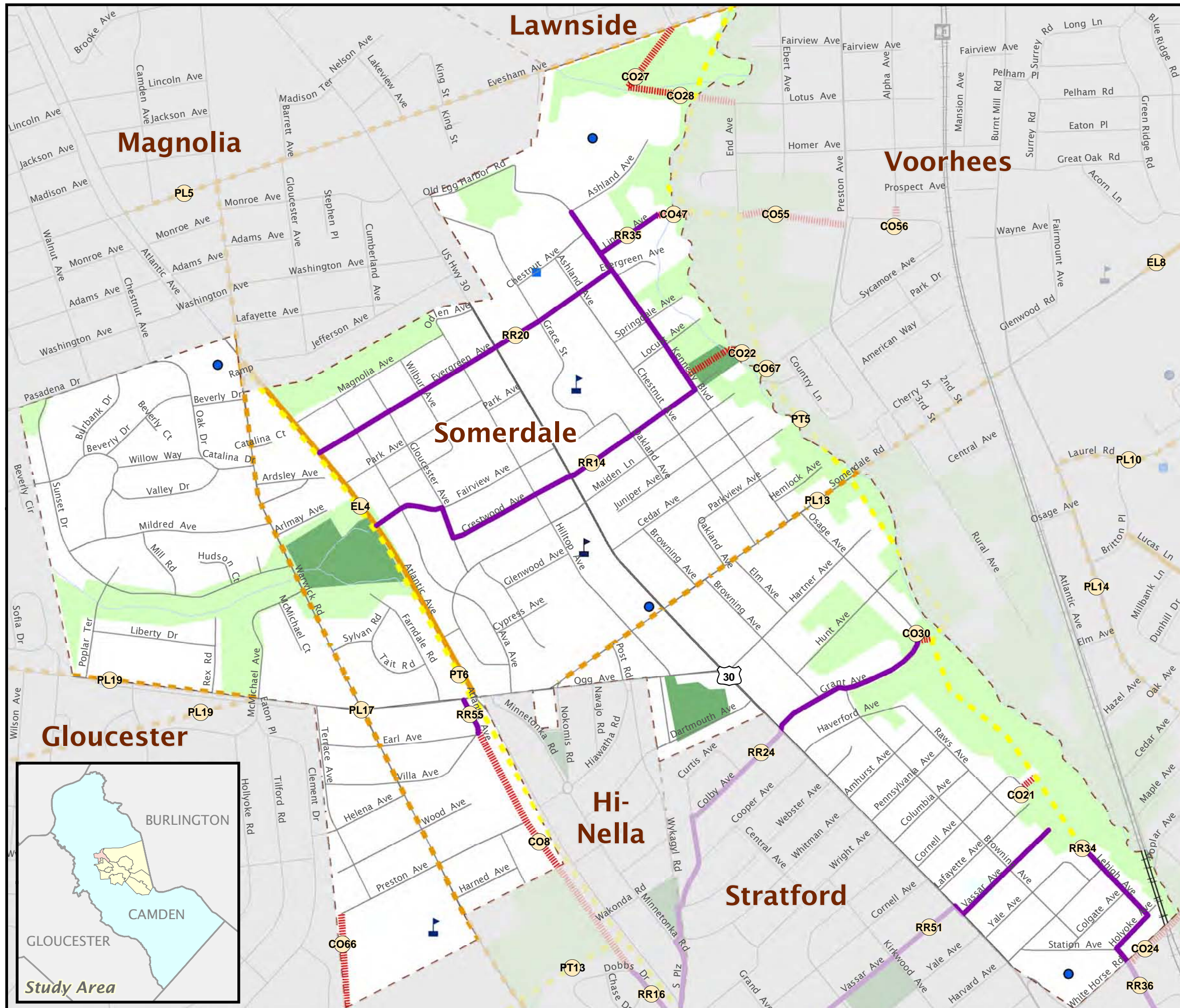
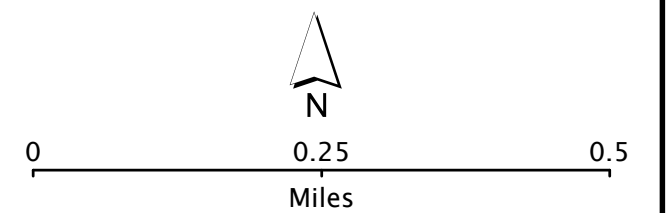
Source: www.tamburrobros.com, 2008

Central Camden County Bicycle / Multi-Use Trail Network

Figure B-17.

Somerdale

-  Existing Bicycle Lane
-  Proposed Bicycle Lane
-  Existing Multi-Use Trail
-  Proposed Multi-Use Trail
-  Connector
-  Recommended Bicycle Route
-  Business Park
-  Shopping Center
-  School
-  Train Station
-  Park
-  Proposed Greenway
-  Network Facility (See Appendix A or B for details)



Stratford Borough

Stratford is located in the western part of the study area. It is bordered by Hi-Nella to the west, Somerdale and Lindenwold to the north, and Laurel Springs to the east. It is the fourth most populous municipality in the study area, and the seventh largest. Figure B-19 on the following page depicts the facilities as well as the local attractors in Stratford.

The only existing facility in Stratford is a small segment of Berlin Road that is outfitted with bicycle lanes. This report is proposing two and a half miles of recommended bicycle routes, between one and two miles each of bicycle lanes and multi-use trails, and half a mile of connectors. Some of the attractors in Stratford are schools. Figure B-20 depicts two of these attractors, the Samuel Yellin Elementary School on the left and St. Luke's Catholic School on the right. These schools are both located at the intersection of Warwick Avenue and Vassar Avenue/Longwood Drive.

Figure B-20: Stratford Attractors



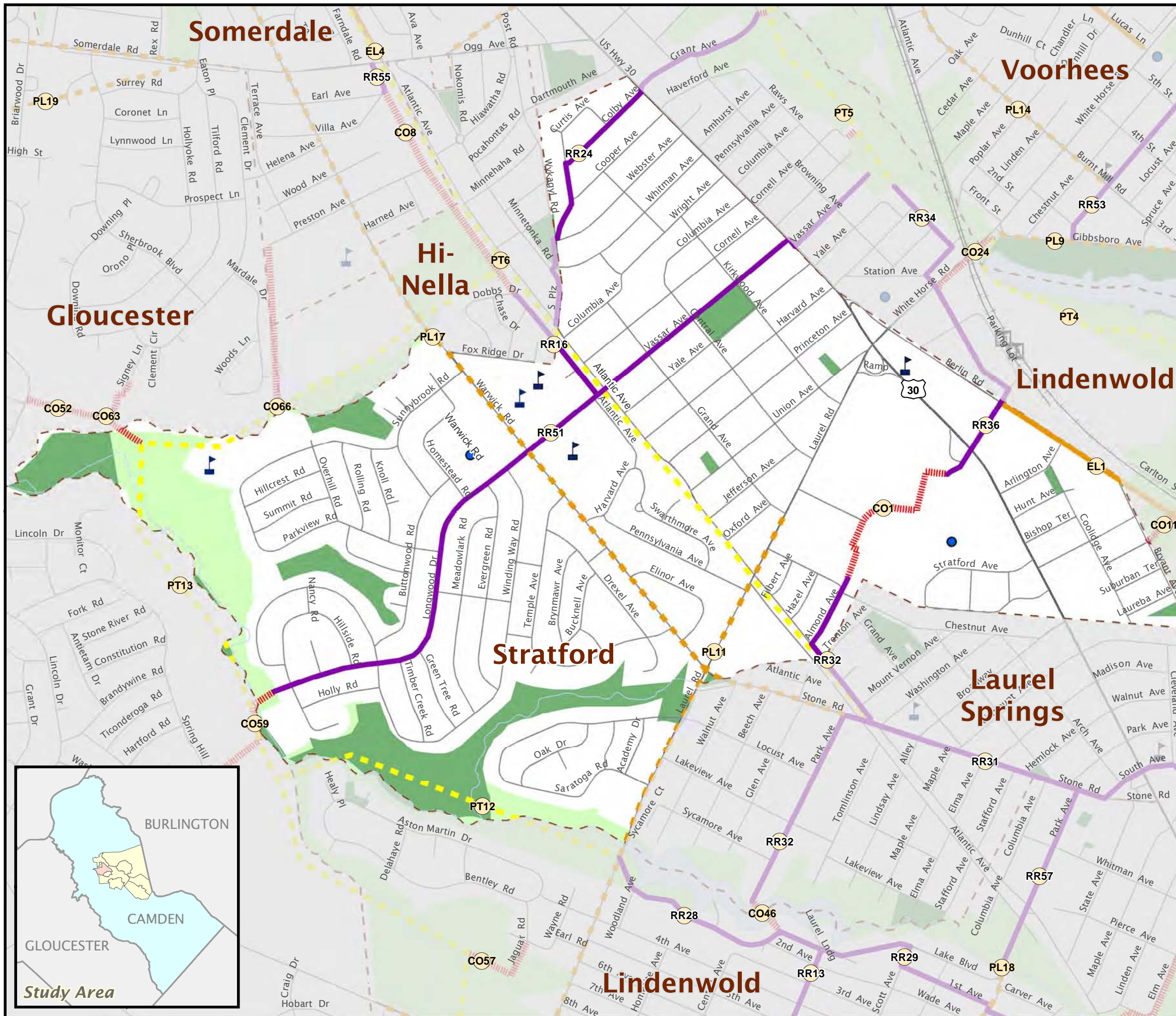
Source: DVRPC, 2008



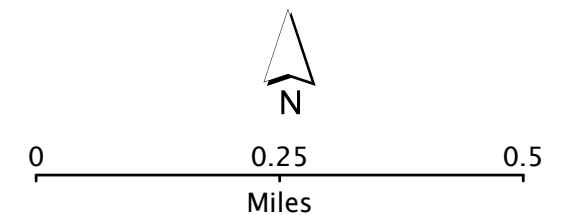
Source: <https://www.stratford.net>, 2008

Central Camden County Bicycle / Multi-Use Trail Network

Figure B-19.
Stratford



- Existing Bicycle Lane
- Proposed Bicycle Lane
- Existing Multi-Use Trail
- Proposed Multi-Use Trail
- Connector
- Recommended Bicycle Route
- Business Park
- Shopping Center
- School
- Train Station
- Park
- Proposed Greenway
- Network Facility (See Appendix A or B for details)



Voorhees Township

Voorhees is located in the northern section of the study area and is the largest municipality, both in terms of population and size. It borders many of the other municipalities. Figure B-21 depicts a map of Voorhees that displays all of the bicycle facilities as well as some of the local attractors that are in Voorhees.

Of all the municipalities in the study area, Voorhees has the highest number of bicycle facilities already in place. Figure B-22, right, depicts one of these facilities, the Voorhees Greenway, which connects with the U.S. Avenue Trail in Gibbsboro through a series of on and off-road facilities. This plan proposes to add roughly six miles of recommended bicycle routes and bicycle lanes, and five miles of multi-use trails in Voorhees.

Figure B-22: Voorhees Bikeway



Source: DVRPC, 2008

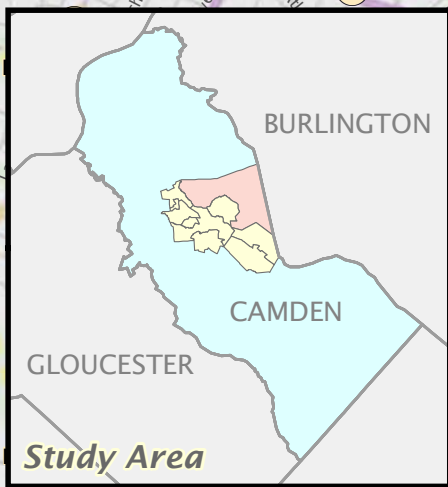
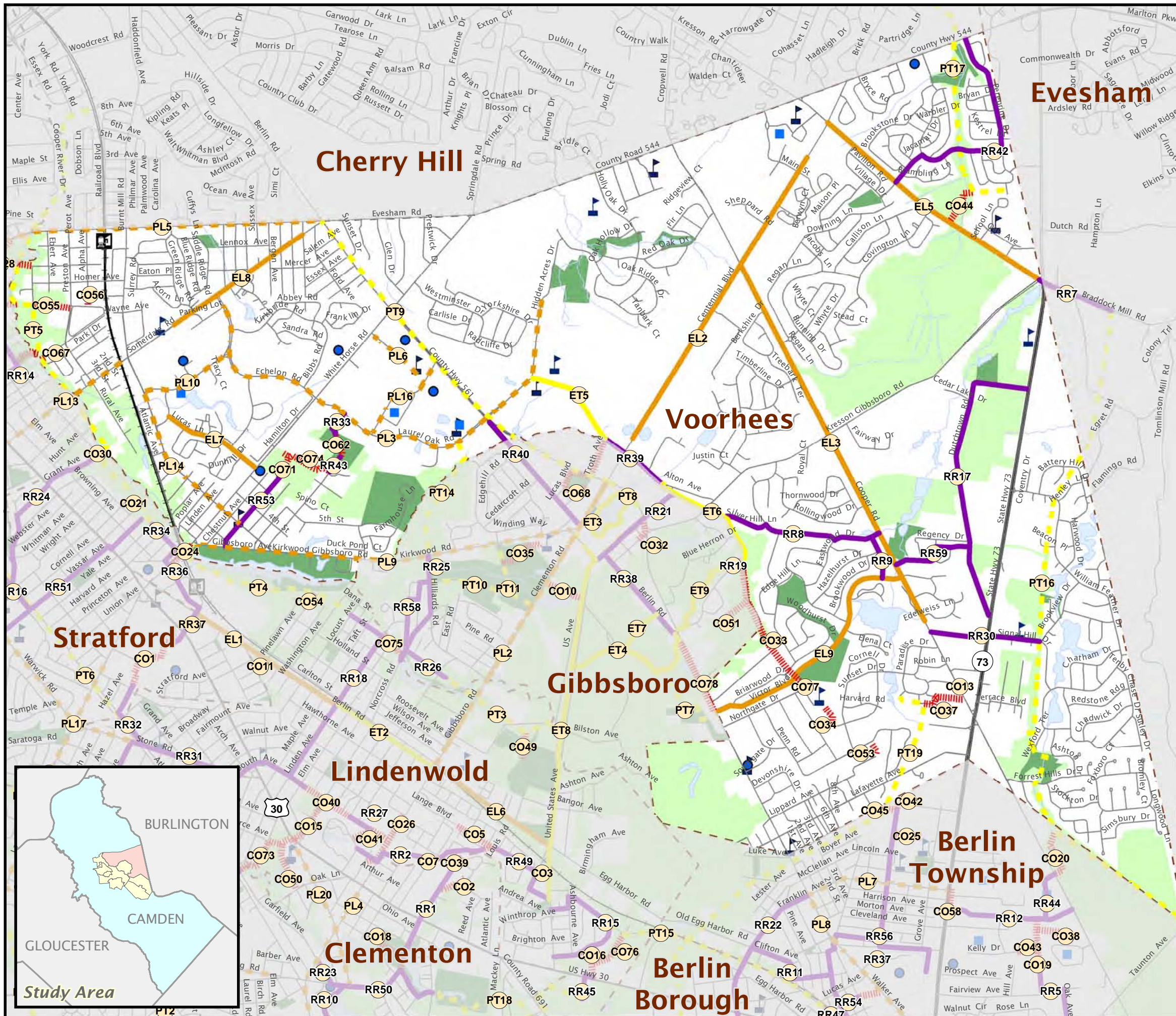
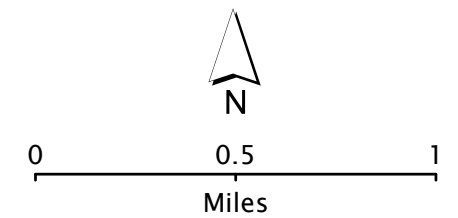
As Voorhees is the largest and most populated of the municipalities involved in the creation of this bicycle network, it has a number of local attractors that this proposed bicycle network would provide access to. Elementary School, Laurel Oak Corporate Center, as well as the Ashland Station on the PATCO line are all major attractors. The soon-to-be complete Voorhees Town Center, a multi-use facility that includes residences, retail, and offices will also serve as a major attractor in Voorhees Township.

Central Camden County Bicycle / Multi-Use Trail Network

Figure B-21.

Voorhees

- Existing Bicycle Lane
- Proposed Bicycle Lane
- Existing Multi-Use Trail
- Proposed Multi-Use Trail
- Connector
- Recommended Bicycle Route
- Business Park
- Shopping Center
- School
- Train Station
- Park
- Proposed Greenway
- Network Facility (See Appendix A or B for details)



Abstract Page

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Key Words:	bicycle, bicyclists, bicycle trails, bicycle lanes, multi-use trails, pedestrians
Abstract:	This report describes a proposed network of bicycle facilities located in ten contiguous municipalities in Central Camden County, New Jersey. Potential alignments and regional attractors were determined through workshops conducted with regional stakeholders. Included in this report are inventories of the existing and proposed bicycle facilities located in each of the ten municipalities.

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