

# Salem County Bicycle Facilities Inventory & Analysis

Prepared by Cross County Connection Transportation Management  
Association

September 2012



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Cross County Connection Transportation Management Association was formally incorporated in 1989 through the efforts of a group of southern New Jersey business leaders, local government officials, and representatives from the New Jersey Department of Transportation (NJDOT) and New Jersey Transit Corporation (NJ TRANSIT) to address mobility issues in the region and reduce the number of vehicles on state and local roadways. Today, Cross County Connection is a non-profit organization partnering with NJDOT, NJ TRANSIT, Federal Highway Administration and its members to provide solutions to complex transportation problems for counties, municipalities, employers and commuters in Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester and Salem Counties.

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# I. Introduction

The *Salem County Bicycle Facilities Inventory and Analysis* documents existing and proposed bicycle facilities and recommends priorities for the planning and implementation of proposed bikeways in the county. The inventory is meant to guide future investment in bicycle infrastructure by identifying corridors where bicycle infrastructure is most needed and recommending which proposed facilities should be prioritized for construction. The Inventory was conducted as an update to Cross County Connection's 2007 *Salem County Bicycle Facilities Inventory*. The Inventory also functions as a snapshot of bikeway planning and implementation activity in the county.

This effort is part of Cross County Connection Transportation Management Association's shared vision for a comprehensive bicycle network in South Jersey that is accessible to a broad range of users. The implementation of such a network will be a major step forward in the safety, health and quality of life for Salem County residents, but will require significant resource allocation and cooperation from state, regional and local stakeholders.

## I.1 Benefits of a Bicycle-friendly Salem County

**Safety** – There were 49 reported crashes involving a bicyclist in Salem County in the five-year period from 2007 to 2011. These crashes resulted in 35 injuries and one fatality. Compared with crashes not involving a bicyclist, an injury is nearly twice as likely and a fatality is over twice as likely to occur when a bicyclist is involved. Appropriately selected and well-designed bicycle facilities create a safer environment for bicyclists and encourage additional bicycle activity, which has been shown to reduce the number of cyclist-related crashes through "safety in numbers."<sup>1</sup>

**Public health** – Salem County has the highest adult obesity rate in New Jersey at 34.2% (2009), an 8.2% increase from 2004.<sup>2</sup> The county also has among the highest rate of physical inactivity in the state at 29.1%. Investing in bicycle facilities is an effective way to encourage physical activity in the county. Research has shown that areas with bicycle facilities have higher levels of bicycle commuting and people living near bicycle facilities are more likely to be active.<sup>3</sup>

**Quality of life** – Communities that are bicycle-friendly provide more travel options for the young and elderly, additional recreation opportunities for residents and foster community engagement. The 2009 Omnibus Household Survey found that 70% percent of Americans considered bike lanes or paths to be important community features.<sup>4</sup>

**Equity** – A comprehensive network of bicycle facilities in Salem County would help ensure that low-income, elderly and disabled residents have access to employment, shopping destinations, transit and other services without the necessity of an automobile. Nearly 10% of Salem County families live below the poverty line and nearly the same amount do not have access to an automobile.<sup>5</sup>

1 Jacobsen, P.L., "Safety in numbers: more walkers and bicyclists, safer walking and bicycling," *Injury Prevention* Vol. 9 Iss. 3 (2003) 205-209, accessed 6/20/12, doi :10.1136/ip.9.3.205.

2 "National Diabetes Surveillance System," Centers for Disease Control and Prevention, accessed 5/3/2012, <http://apps.nccd.cdc.gov/DDTSTRS/default.aspx>.

3 Pucher, Dill and Handy, "Infrastructure, programs, and policies to increase bicycling: An international review," *Preventive Medicine* 50 (2010) S106-S125, accessed 5/3/2012, doi:10.1016/j.ypmed.2009.07.028.

4 U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, *Transportation Statistics Annual Report 2010* (Washington, DC: 2011): 7, accessed 4/10/2012, [http://www.bts.gov/publications/transportation\\_statistics\\_annual\\_report/2010/](http://www.bts.gov/publications/transportation_statistics_annual_report/2010/).

5 U.S. Census Bureau, 2010 American Community Survey, accessed on 4/19/2012, <http://factfinder2.census.gov/faces/nav/jsf/pages/>

Providing for low cost travel options is an essential component of an equitable transportation network.

Environmental – Many short trips that are currently driven in Salem County could be made by bicycle if safe travel accommodations were available. The New Jersey Department of Environmental Protection (NJDEP) estimates that on-road transportation accounts for over 30% of gross greenhouse gas (GHG) emissions in New Jersey.<sup>6</sup> Even a small reduction in motor vehicle trips would improve air quality and result in a significant reduction in greenhouse gas emissions that contribute to climate change.

## I.2 Setting

Salem County, shown in Map 1, is located in southwest New Jersey on the Delaware River and Bay. The county is bordered by Gloucester County to the north and Cumberland County at its southern and eastern borders. It encompasses 373 square miles and has a total population of 66,083.<sup>7</sup> The topography of the county is relatively flat with minimal elevation change. The transportation network in the county is primarily comprised of rural, low-volume roadways. There are six high-volume state highways that traverse the county, and Interstate 295 which connects the county with Delaware via the Delaware Memorial Bridge and prohibits non-motorized vehicle travel. There are 886 miles of public roads in the county with 48% under Municipal jurisdiction, 41% County, 10% State, 1% South Jersey Transportation Authority and <1% Park jurisdiction.<sup>8</sup> The vast majority of state highway mileage in the county is made up of two-lane roadways with shoulders. County roadways vary in width and character but many are rural roads such as the section of Harding Highway pictured in Figure 1. Weather in the county is typical of southern New Jersey with warm summers and cool winters, with average highs in winter above freezing.

Figure 1. Harding Highway, Carneys Point Twp



Table 1 shows the percent distribution of land uses in Salem County. As shown in Map 2, over two-thirds of county’s non-water land area is devoted to agricultural use. 27% of the county’s non-water land area is comprised of wetlands. Urban development is concentrated primarily along the US 130/NJ

Table 1: Salem County Land Uses

Land Use Type	Percentage
Urban	5.9%
Agriculture	19.5%
Forest	8.0%
Wetland	14.3%
Water	52.1%
Barren Land	0.2%

Source: NJDEP

index.xhtml.

6 New Jersey Department of Environmental Protection, *Statewide Greenhouse Gas Emission Inventory for 2008* (2011): 4, accessed on 5/3/2012, <http://www.nj.gov/dep/sage/docs/ghg-inventory2008.pdf>.

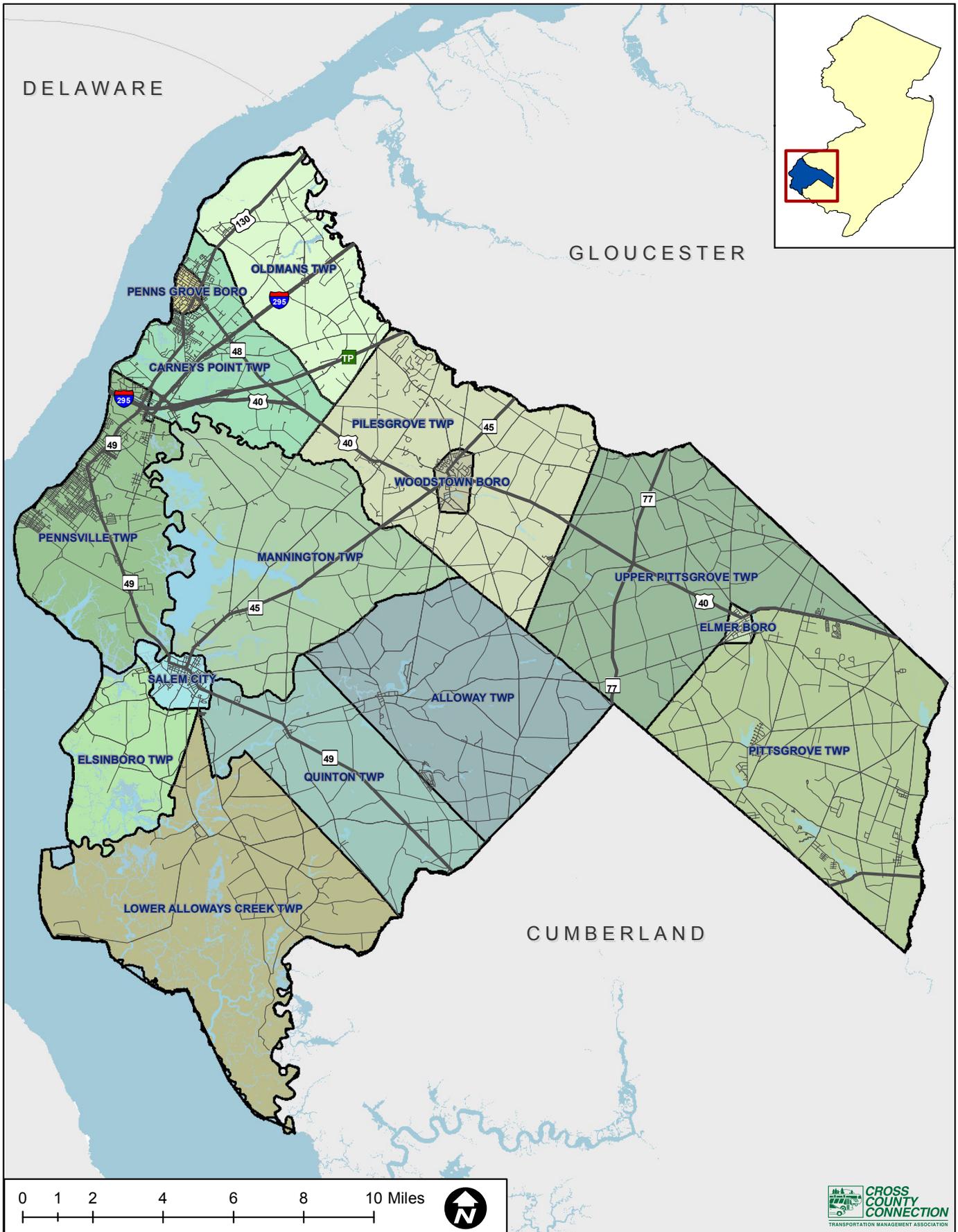
7 U.S. Census Bureau, 2010 U.S. Census, accessed on 4/19/2012, <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.

8 “New Jersey’s Public Road Mileage By Jurisdiction,” New Jersey Department of Transportation, Bureau of Transportation Data Development, accessed 3/28/2012, [http://www.state.nj.us/transportation/refdata/roadway/pdf/hpms2010/njprmbj\\_10.pdf](http://www.state.nj.us/transportation/refdata/roadway/pdf/hpms2010/njprmbj_10.pdf).

49 corridor from Carneys Point Township to Salem City, as well as Woodstown and Elmer Boroughs. Much of the county's population is also located in these areas, as shown in Map 3. Several parks and protected areas are located in the county including: Parvin State Park, Fort Mott State Park, Supawna Meadows National Wildlife Refuge, Mad Horse Creek Wildlife Management Area, Elmer Lake Wildlife Management Area, Maskells Mill Wildlife Management Area, Abbotts Meadow Wildlife Management Area and many other state, county and local recreation areas.

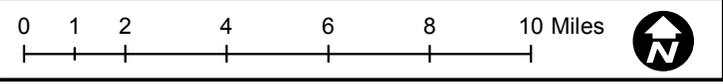
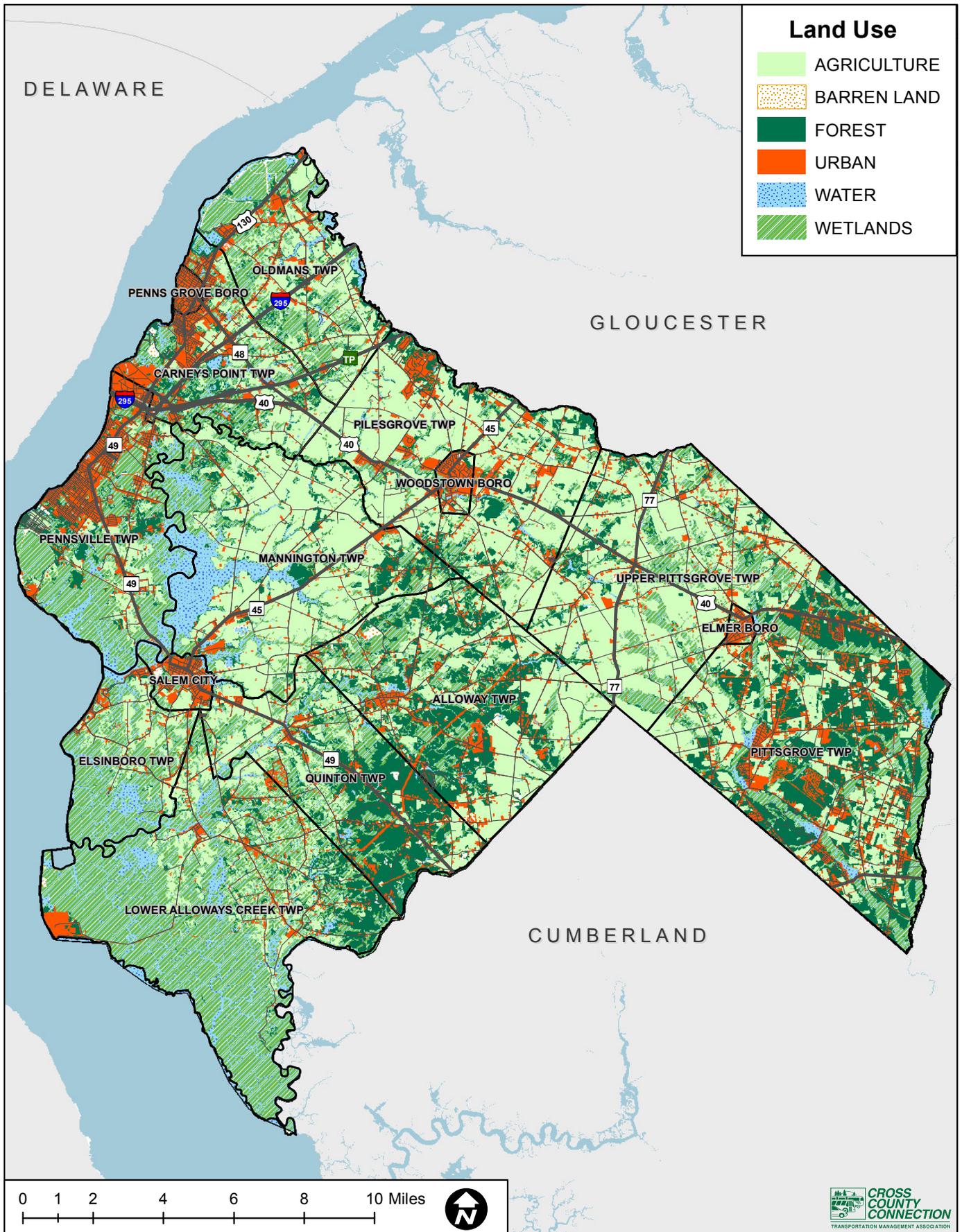
# Map I: Salem County Overview

Salem County Bicycle Facilities Inventory & Analysis, September 2012



# Map 2: Salem County Land Use Overview

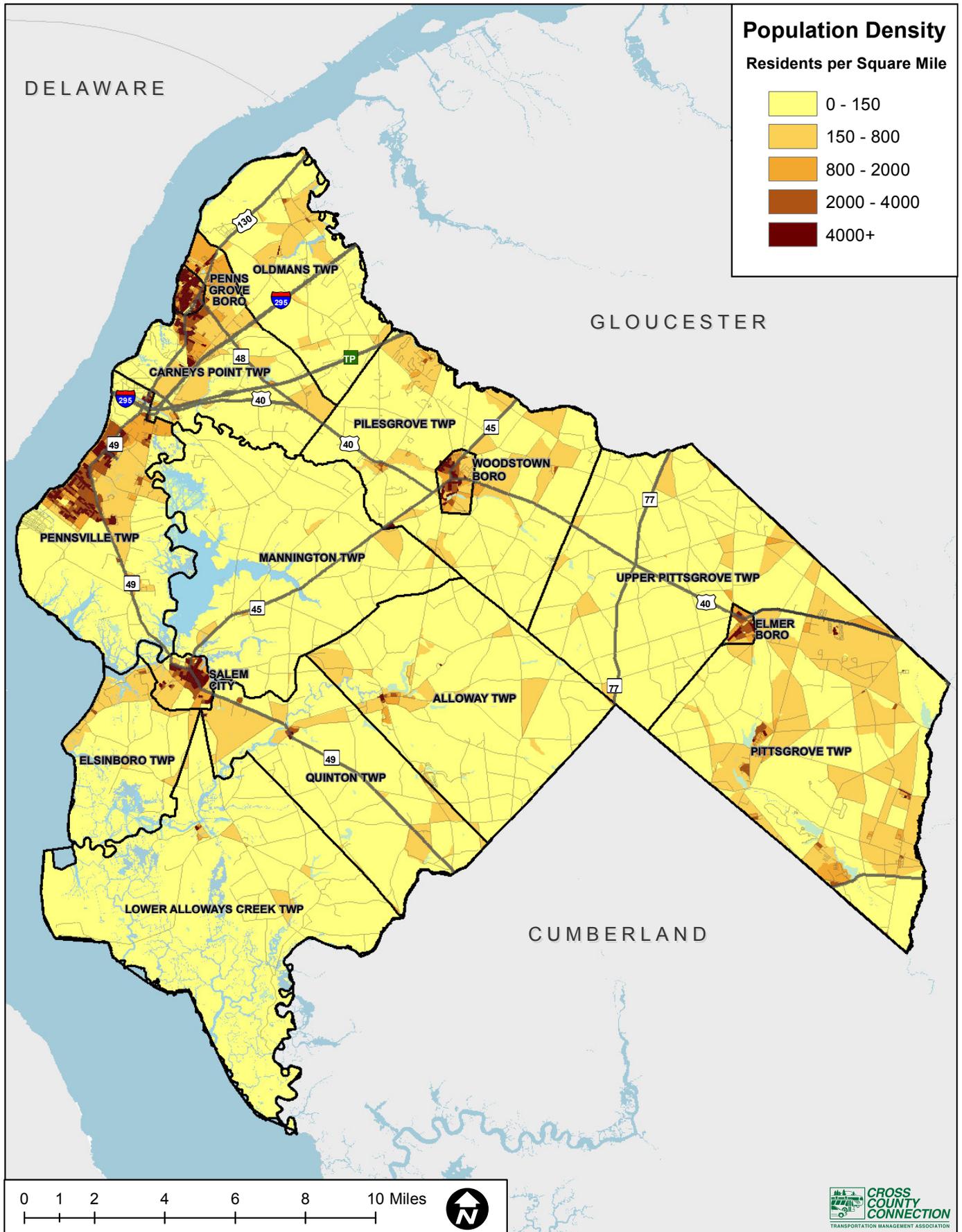
Salem County Bicycle Facilities Inventory & Analysis, September 2012



Data Source: NJDEP

# Map 3: Salem County Population Density

Salem County Bicycle Facilities Inventory & Analysis, September 2012



Data Source: US Census, 2010

## 2 Goals and Methods

### 2.1 Goals

The goal of the *Salem County Bicycle Facilities Inventory* is to increase bicycling in Salem County through construction of a comprehensive bicycle network. The Inventory encourages development of bicycle facilities by:

1. Documenting existing and proposed bicycle facilities in the county to ensure that public and private interests have current information on the county's bicycle network.
2. Creating a Bikeway Demand Index showing areas where bicycle travel is likely to occur, or where there may be latent demand for bikeways to prioritize creation of high value bikeways.
3. Providing information on policies and funding sources that support the creation of bikeways in Salem County.

### 2.2 Consistency with Existing Plans and Policies

This document is consistent with the New Jersey Department of Transportation's (NJDOT) Complete Streets policy that seeks to "create a comprehensive, integrated, connected multi-modal network" that "provide[s] safe and accessible accommodations for existing and future pedestrian, bicycle and transit facilities."<sup>9</sup> The policy defines a complete street as "means to provide safe access for all users by designing and operating a comprehensive, integrated, connected multi-modal network of transportation options." This policy includes provisions for bicycle accessibility in rural areas and incentives in the Local Aid Program for municipalities to develop and implement a complete streets policy. The NJDOT strongly encourages municipalities and counties in New Jersey to adopt complete streets policies. In addition to the benefits described in the NJDOT policy, local and regional complete streets policies are a cost-effective way to proactively design roadways for all users and avoid more expensive retrofitting in the future.

Existing state, regional and local plans were considered in creating the Inventory, and its contents are consistent with the goals outlined in relevant plans:

<sup>9</sup> New Jersey Department of Transportation, "Policy No. 703: Complete Streets Policy" (2009), <http://www.completestreets.org/webdocs/policy/cs-nj-dotpolicy.pdf>.

**Figure 2. Bike Crossing on Porchtown Rd, Pittsgrove**



New Jersey Statewide Bicycle & Pedestrian Master Plan – New Jersey Department of Transportation<sup>10</sup>

## Goal 1 – Build the Infrastructure

“Create a bicycle and pedestrian infrastructure by planning, designing, constructing and managing transportation and recreation facilities that will accommodate and encourage use by bicyclists and pedestrians and be responsive to their needs.”

## Goal 2 – Improve Access

“Make community destinations, transit facilities and recreation facilities accessible and convenient for use by all types and skill levels of bicyclists and pedestrians.”

## Goal 3 – Update Policies, Ordinances and Procedures

“Reform land use planning policies, ordinances and procedures to maximize opportunities for walking and bicycling.”

## Goal 4 – Educate and Enforce

“Develop and implement education and enforcement programs that will result in reduction of crashes and a greater sense of security and confidence for bicyclists and pedestrians.”

## Goal 5 – Foster a Pro-Bicycling and Walking Ethic

“Increase bicycling and walking by fostering a pro-bicycling and pro-walking ethic in individuals, private sector organizations and all levels of government.”

2035 Regional Transportation Plan - South Jersey Transportation Planning Organization<sup>11</sup>

“It is important to encourage the use of alternative modes to provide mobility, accessibility, and improve the quality of life of residents and tourists, and to an integrated transportation system, that includes non-motorized modes.”

Salem County Farmland Conservation & Recreation Plan – Salem County<sup>12</sup>

“Connect People with the Outdoors, Agriculture, and Natural Areas. Implement multiple-use trail systems that connect parks with neighborhoods and town centers, including rail trails, for bicycling, equestrian activities, and hiking.”

## 2.3 Methods

### 2.3.1 Inventory Update

In order to update Cross County Connection’s 2007 inventory of bicycle facilities, municipalities and Salem County were surveyed and asked to provide confirmation of facilities contained in the 2007 Inventory and details on any newly proposed or constructed facilities. Municipal and County representatives were also asked about additional policies, plans and activities that exist in their communities. These results were tabulated and mapped for inclusion in Cross County Connection’s

10 New Jersey Department of Transportation, *Statewide Bicycle and Pedestrian Master Plan - Phase 2* (2004), accessed on 5/3/2012, <http://www.bikemap.com/RBA/NJBikePed.pdf>.

11 South Jersey Transportation Planning Authority, *2035 Regional Transportation Plan Update: Plan Outlook Analysis* (2010), accessed on 4/24/2012, [http://www.sjtpo.org/Documents/RTP/2035RTP\\_C\\_Plan\\_Outlook\\_Analysis.pdf](http://www.sjtpo.org/Documents/RTP/2035RTP_C_Plan_Outlook_Analysis.pdf).

12 County of Salem, *Open Space and Recreation Plan* (2006), accessed on 4/24/2012, [http://www.salemcountynj.gov/cmssite/downloads/newsreleases/current%20news/Final\\_Plan.pdf](http://www.salemcountynj.gov/cmssite/downloads/newsreleases/current%20news/Final_Plan.pdf).

Inventory. Responses were received from every municipality in the county and reviewed by Salem County. Existing facilities were also verified through field visits to facility locations. The survey instrument is included in Appendix A.

In addition to this update, existing bikeways were classified further into three categories:

- Bike Paths – Off-road bicycle or multi-use paths
- Bike Lanes – Striped on-road bicycle lanes
- Bike Routes – Bicycle routes or “shared roads” that include a combination of signage and/or pavement markings

Figure 3 shows examples of each of the bikeway type in Salem County.

**Figure 3: Bikeway Types in Salem County**



### 2.3.2 Bikeway Demand Index

In order to prioritize investment in the county bicycle network, an analysis was undertaken to estimate bicycle travel demand based on locations that would generate or attract trips, demographic factors and characteristics of the built environment that are generally favorable to bicycle travel. Factors that this estimation of latent demand considers include: road network density and connectivity; population density, business locations, households without access to a motor vehicle; and an area’s proximity to other trip attractors like transit stops, schools, parks and points of interest. These factors were assigned weighted values and plotted in a 10 x 10 meter grid of the county using a raster-based geographic information systems (GIS) analysis. These weighted values were summed for each cell in the county grid to reach a “demand score.” Using these scores, proposed facilities were ranked for construction prioritization according to the estimated bicycle travel demand of the surrounding area.

Municipalities that demonstrated a high level of estimated demand were identified as candidates for future bicycle facility planning efforts. Table 2 contains the travel demand variables included in the

estimation and their weighting according to proximity and magnitude. The variables were weighted according to their correlation to bicycle travel using intuitive and best practice assumptions. Additional information including data sources and methodology is included in Appendix B.

**Table 2: Bicycle Travel Demand Index Variables**

Importance	Demand Factors	Weight				Geography
		Level 1	Level 2	Level 3	Level 4	
High	Population density	20	15	10	5	Census Block
High	Households without auto per sq. mi.	20	15	10	5	Census Tract
High	Employment location density	20	15	10	5	Census Block
High	Road network connectivity	20	15	10	5	Census Block
High	Road network density	20	15	10	5	Census Block
		1/2 Mile	1 Mile	1 1/2 Mile	2 Mile	
High	Colleges/Universities	20	15	10	5	Point
Medium	Schools	10	5	2	1	Point
Medium	NJ TRANSIT Bus Stops	10	5	2	1	Point
Medium	Libraries	10	5	2	1	Point
Medium	Park Entrances	10	5	2	1	Point
Medium	Existing Bikeways	10	5	2	1	Point
Low	Museums/Historic points of interest	4	2	1	1	Point
Low	Hospitals	4	2	1	1	Point
Low	Places of Worship	4	2	1	1	Point

Variables that are contained in a census area, such as population density, were assigned to one of four weighting values based on natural breaks in their respective data set. Areas around variables that are location-specific, such as schools and existing bikeways, were assigned weighting values based on their proximity to the proposed bikeway. For instance, the area within a 1/2 mile radius of a school is assigned a value of ten, while the area located between a 1/2 mile and one mile radius of the school is assigned a value of five.

### 3 Existing Conditions

#### 3.1 Bikeway Network

The bicycle network in Salem County consists of 9.1 miles of bikeways, as shown in Table 3, of which 6 miles are bike lanes, 1.9 miles are shared roads and routes and 1.2 miles are bike paths. Map 4 shows the current network of existing and proposed bikeways in the county. Bike lanes exist in Pilesgrove Township on Kings Highway from Marlton Road to Laurel Lane, and Marlton Road from Kings Highway to Marlton Recreation Park. In Woodstown Borough, bike lanes exist on Main Street between Harris Lane and Elm Street, and on Elm Street from Main Street to School Lane. These Woodstown bike lanes are part of a larger bicycle route that connects the town center, including the local public library, high school and middle school to Marlton Recreation Park and connecting bike lanes in Pilesgrove Township. Appendix C contains maps of existing and proposed bikeways for each municipality. The bike lanes located on Elm Street are fairly narrow, measuring approximately two feet from the edge of the gutter pan to the lane stripe. A bicycle lane exists on Porchtown Road from Centerton Road to Upper Neck Road, where it falls short of connecting to a small on- and off-road bike facility leading to the entrance of Green Branch Park. A table of all existing and proposed bikeways in Salem County is provided in Appendix D.

Currently, three municipalities have existing bikeways: Pilesgrove Township, Pittsgrove Township and Woodstown Borough. While nearly 94% of the county’s existing and proposed bicycle network remains unconstructed, many of the rural roads on which facilities are proposed are bicycle-compatible according to current NJDOT design guidelines, and have shoulders. As shown in Table 3, there are currently 7.9 miles of existing on-road facilities with another 131.3 miles of facilities proposed. In addition, there is 1.2 miles of off-road bicycle facilities with 1 mile of off-road facilities proposed. The Cumberland Salem Revolution NJDOT bicycle tour is also located partially in Salem County.<sup>13</sup> This tour connects several historic landmarks such as Fort Mott, and travels through the Delaware Bay shore areas of Salem and Cumberland Counties.

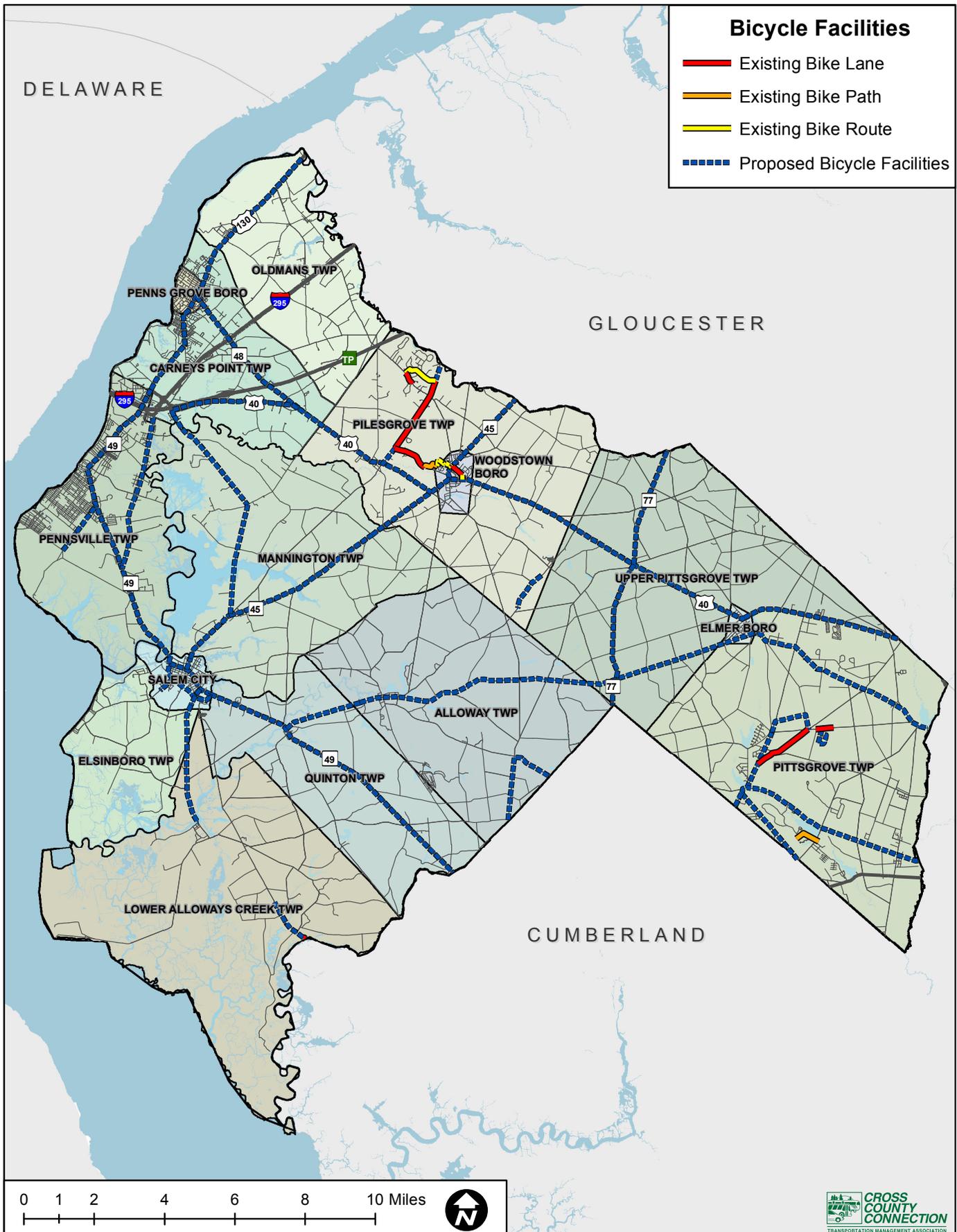
**Table 3: Salem County Bicycle Network**

Facility Type	Miles	% Complete
On-Road total	139.2	5.7%
Existing	7.9	
Proposed	131.3	
Off-road total	2.2	55.0%
Existing	1.2	
Proposed	1.0	
Total network	141.4	6.4%
Existing	9.1	
Proposed	132.3	

<sup>13</sup> New Jersey Department of Transportation, “Cumberland Salem Revolution: A Tour Guide for Cyclists” (2008), accessed on 2/20/2012, <http://www.state.nj.us/transportation/commuter/bike/pdf/cumberlandandsalem.pdf>.

# Map 4: Salem County Existing & Proposed Bikeways

Salem County Bicycle Facilities Inventory & Analysis, September 2012



### 3.2 Transit Connections

Improving bicycle access to transit is a win-win for increasing rates of bicycling and transit use and providing regional bike travel opportunities. Providing these connections through construction of bikeways and bicycle accommodations, such as bike parking and on-vehicle storage, increases the number of people that have access to transit investments. Other benefits include potential increases in transit ridership and better mobility for those without a car. The low-density, rural character in much of Salem County means that travel distances to transit are often higher than in urban areas, and creating meaningful bicycle access to bus services is even more important.

Bikeways are proposed along nearly all of Salem County's major transit corridors, shown in Map 5. The county is served by four NJ TRANSIT bus lines:

401 Route – Philadelphia > Gloucester City > Woodbury > Swedesboro > Woodstown > Salem City

402 Route – Philadelphia > Woodbury > West Deptford > Penns Grove > Pennsville

410 Route – Philadelphia > Gloucester City > Upper Pittsgrove > Bridgeton

468 Route – Penns Grove > Pennsville > Salem City > Woodstown

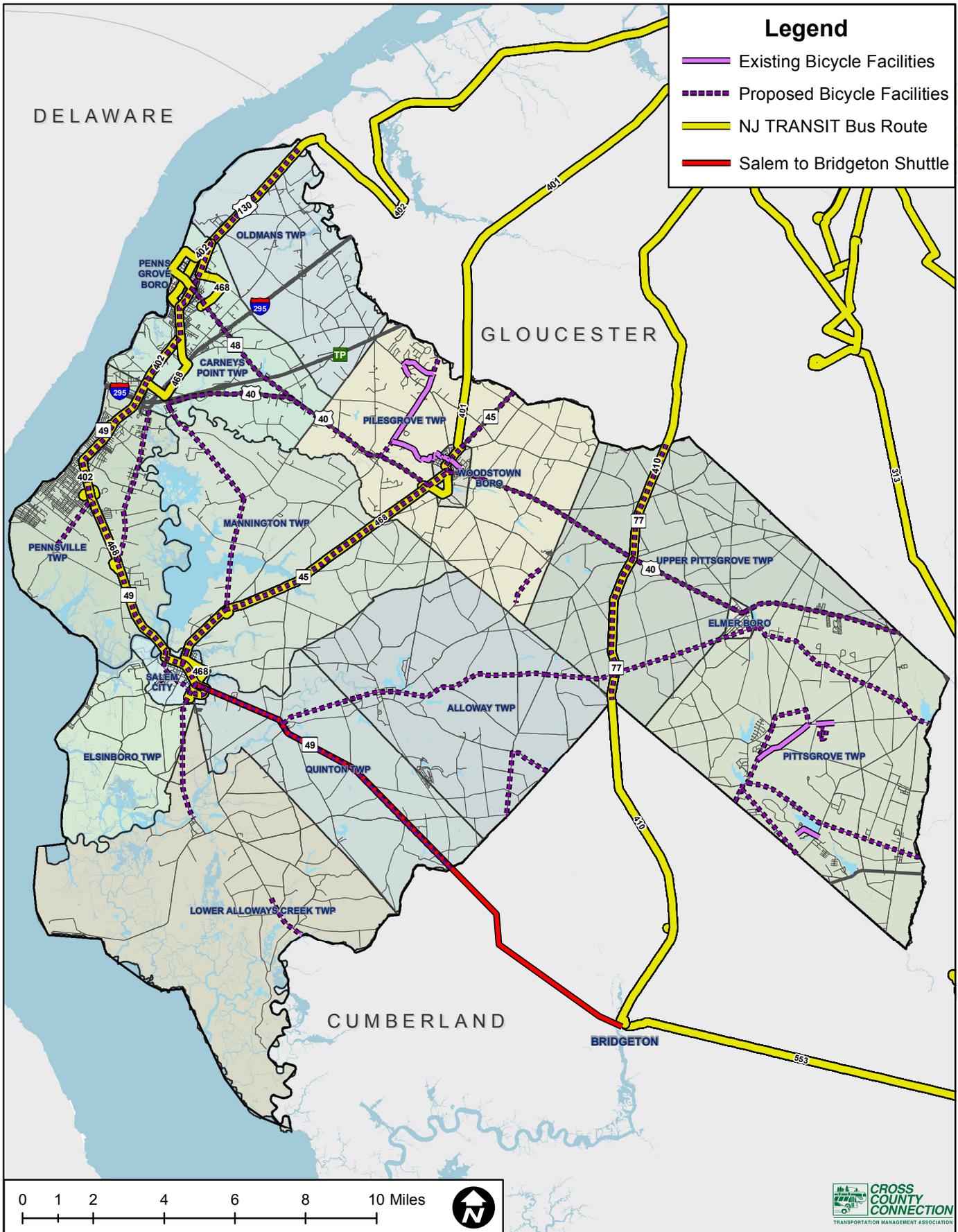
Existing bikeways in Woodstown and Pilesgrove Township provide residents and visitors access to the NJ TRANSIT 401 and 468 bus routes. Facilities like these create a safe environment for these users to access employment, social services and non-work destinations in Philadelphia, Bridgeton, Salem City and many other destinations in Camden and Gloucester Counties.

Proposed on-road bikeways on US 130, NJ 45 and NJ 49 are located along NJ TRANSIT bus routes 401, 402 and 468; while the bikeway proposed on NJ 77 is located on the 410 bus route. Proposed bikeways located on US 40, NJ 49, and County Highways 581, 540 and 551 intersect these bus routes and could provide better transit access to many other areas of Salem County if constructed.

In addition to the NJ TRANSIT bus routes listed above, a pilot route operated by NJ TRANSIT provides service between Salem City to Bridgeton in Cumberland County, travelling on Route 49. This shuttle operates two days a week and is administered by the Salem County Office on Aging. The route connects residents in Salem City with social security and housing services. Buses serving this route do not currently have bicycle storage such as the front racks used by NJ TRANSIT. Cross County Connection recommends that bike racks or on-board bike storage be installed on vehicles serving this route. Installation of bicycle parking should also be considered at stops with significant numbers of boardings.

# Map 5: Salem County Transit Service

Salem County Bicycle Facilities Inventory & Analysis, September 2012



Data Source: NJ TRANSIT

### 3.3 Regional Connections

Regional connections are vital to the viability of the county bicycle network and merit additional consideration as the network is implemented. The 2004 New Jersey Statewide Bicycle and Pedestrian Master Plan identifies five programmed regional on-road connections and one planned regional connection for Salem County. These connections are consistent with survey results received for this inventory. The Master Plan defines ‘programmed’ facilities as those with funding committed, however the current status of these proposed facilities was not determined. As shown on Maps 6 and 7, the programmed connections are located on NJ 45 in Pilesgrove Township, at north and south locations on NJ 77 in Upper Pittsgrove Township, US 40 bordering both Pittsgrove and Upper Pittsgrove Townships and NJ 49 in Quinton Township. The programmed connection on US 40 is shown on Map 7, while the remaining programmed connections are shown on Map 6. None of these connections are currently constructed. The Plan also identifies a planned on-road connection on County Highway 623 in Lower Alloways Creek Township, shown on Map 7. The Cumberland County portion of this connection has been completed as a bike route, with “Share the Road” signage placed on this road that carries approximately 1,000 vehicles per day on average. With the exception of County Highway 623, each of the regional connections identified in the Statewide Plan are located on state highways.

The two proposed regional connections not listed in the Statewide Plan, shown on Table 4, are located in Alloway Township on County Highways 640 and 635. Both of these connections are proposed on rural two-lane county roadways with no shoulder. The most recent traffic volume reports for County Highway 635 report an average daily traffic count of approximately 2,500 in 2006 and 2009. Traffic volumes were not available for County Highway 640. Traffic volumes, measured here in annual average daily traffic (AADT), are used by NJDOT design guidelines in determining the bicycle-friendliness of a road. In general, a more heavily trafficked street requires more separation and accommodation for safe bicycle travel.

**Table 4: Proposed Regional Connections**

Location	Municipality	Volume	Roadway Characteristics	Current Bicycle Compatibility
US 40	Upper Pittsgrove	10,260 AADT	Urban, two-lane, 4' shoulder	No
NJ 45	Pilesgrove	3,528 AADT	Rural, two-lane, 2' shoulder	No
NJ 49	Quinton	4,113 AADT	Rural, two-lane, 4' shoulder	No
NJ 77 (north)	Upper Pittsgrove	5,107 AADT	Rural, two-lane, 4' shoulder	No
NJ 77 (south)	Upper Pittsgrove	5,754 AADT	Rural, two-lane, 4.5' shoulder	No
Salem County 623	Lower Alloways Creek	895 AADT	Rural, two-lane, 1' shoulder	Yes
Salem County 635	Alloway	2,513 AADT	Rural, two-lane, 1' shoulder	No
Salem County 640	Alloway	not available	Rural, two-lane, 1' shoulder	

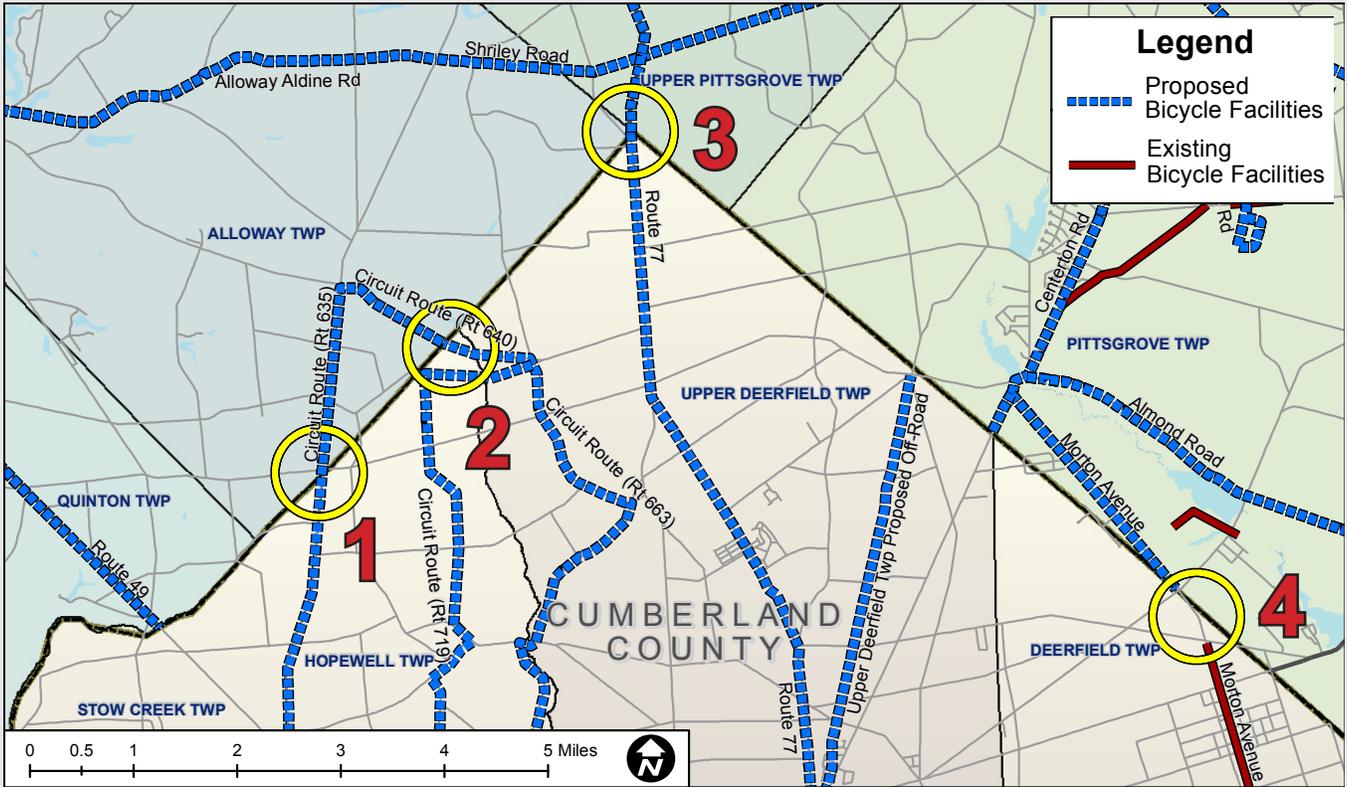
There is a notable potential connection on Morton Avenue in Upper Pittsgrove Township shown on Map 6. A proposed bikeway on Morton Avenue terminates at the county line, however there is no connecting facility proposed in Deerfield Township, Cumberland County. This is despite the presence of an existing bike lane on Morton Avenue ½ mile south of the county line in Deerfield Township.

Under NJDOT bikeway design guidelines one of the seven proposed on-road connections is currently

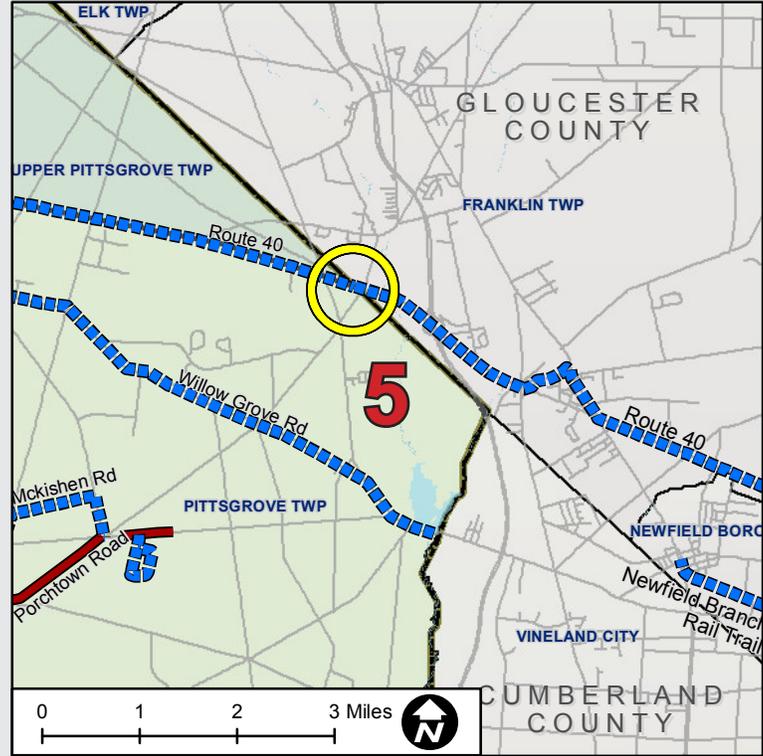
bicycle compatible, however formal designation of this connection as a bikeway would both increase the visibility of the bicycle network and encourage usage by cyclists.

# Map 6: Salem County Regional Bikeway Connections I

Salem County Bicycle Facilities Inventory & Analysis, September 2012

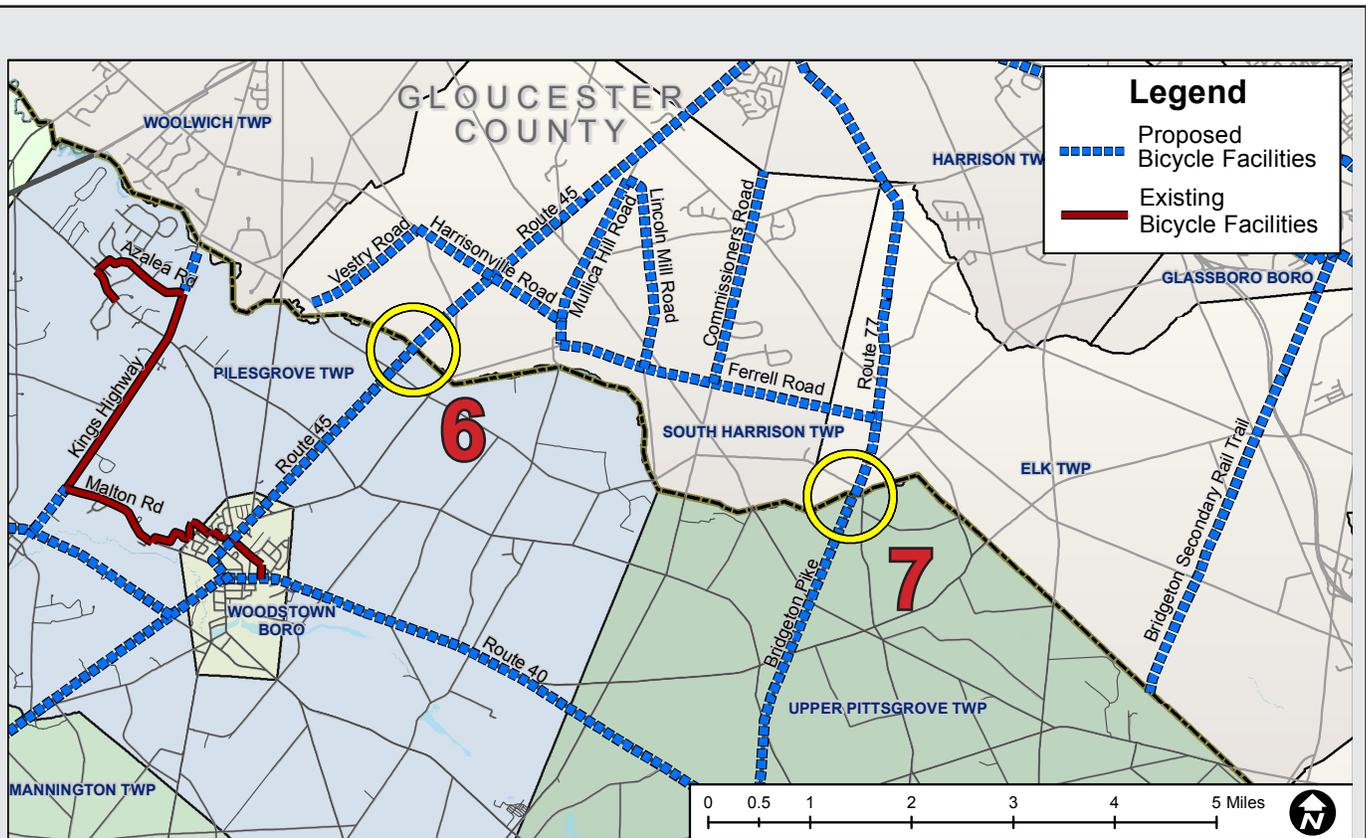


- 1. Salem County 635  
Alloway Township
- 2. Salem County 640  
Alloway Township
- 3. NJ 77 (south)  
Upper Pittsgrove Township
- 4. Morton Ave. (not proposed)  
Pittsgrove Township
- 5. US 40  
Upper Pittsgrove Township

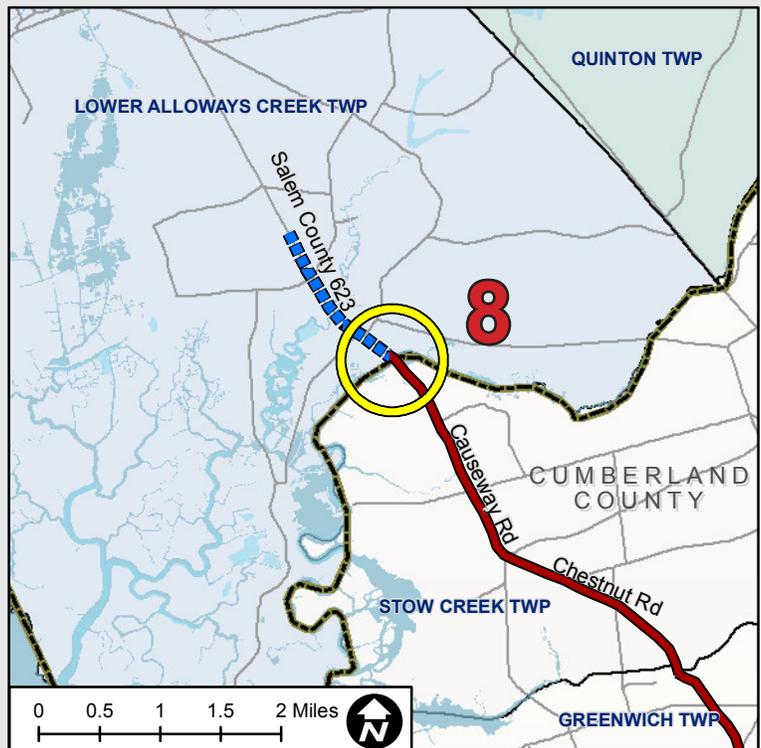


# Map 7: Salem County Regional Bikeway Connections 2

Salem County Bicycle Facilities Inventory & Analysis, September 2012



- 6. NJ 45  
Pilesgrove Township
- 7. NJ 77 (north)  
Upper Pittsgrove Township
- 8. Salem County 623  
Lower Alloways Creek Township



### 3.4 Bicycle Collisions & Safety Efforts

Safety remains the highest priority in developing a countywide bicycle network. Lack of a safe cycling environment is one of the primary reasons that people choose not to ride.<sup>1415</sup> Providing bicycle facilities has been shown to increase the safety of roadways even as the number of cyclists using that travel corridor increases.<sup>1617</sup> Motor vehicle and bicycle collision data was accessed through Plan4Safety, a data tool created for NJDOT by the Transportation Safety Resource Center at the Rutgers Center for Advanced Infrastructure and Transportation (CAIT) that hosts current statewide crash data.

Between 2007 and 2011, 49 crashes were reported involving bicyclist in the county. Of those 49 crashes, 35 resulted in an injury and one resulted in a fatality. The number of bicycle collisions in the county has fluctuated from 2007 to 2011 as shown in Table 5, with an average of 10 bicycle crashes per year. Compared to motor vehicle crash statistics during the same period in the county, collisions involving bicyclists are nearly twice as likely to result in injury or death. The injury rate for reported bicycle collisions is 71%, compared with the motor vehicle collision injury rate of 37% in that five-year period.

The largest share of crashes occurred on roads with a 25 MPH posted speed limit, as shown in Table 6, however this may be due to greater volumes of cycle traffic on low-speed roadways. As one might expect and several studies demonstrate, injury rates are greater on higher speed roads. The injury rate for incidents on streets with reported speed limits under 40 MPH is 69%, while the injury rate for incidents occurring on streets with higher reported speed limits is 81%.

As shown in Map 8, many bicycle crashes are clustered in the urban communities of Penns Grove, Pennsville and Salem City. While an in-depth analysis of bicycle crash incidents in the county was out of the scope of this inventory, the clustering of these bicycle crashes suggests that these areas be prioritized for future safety efforts and analysis.

**Table 5: Crash Frequency, 2007-2011, Salem County**

Year	Total Crashes	Injuries	Fatalities
2007	12	8	0
2008	12	9	0
2009	7	5	1
2010	11	8	0
2011	7	5	0
<b>Total</b>	<b>49</b>	<b>35</b>	<b>1</b>

**Table 6: Reported Crashes Involving a Bicyclist by Speed Limit, 2007-2011, Salem County**

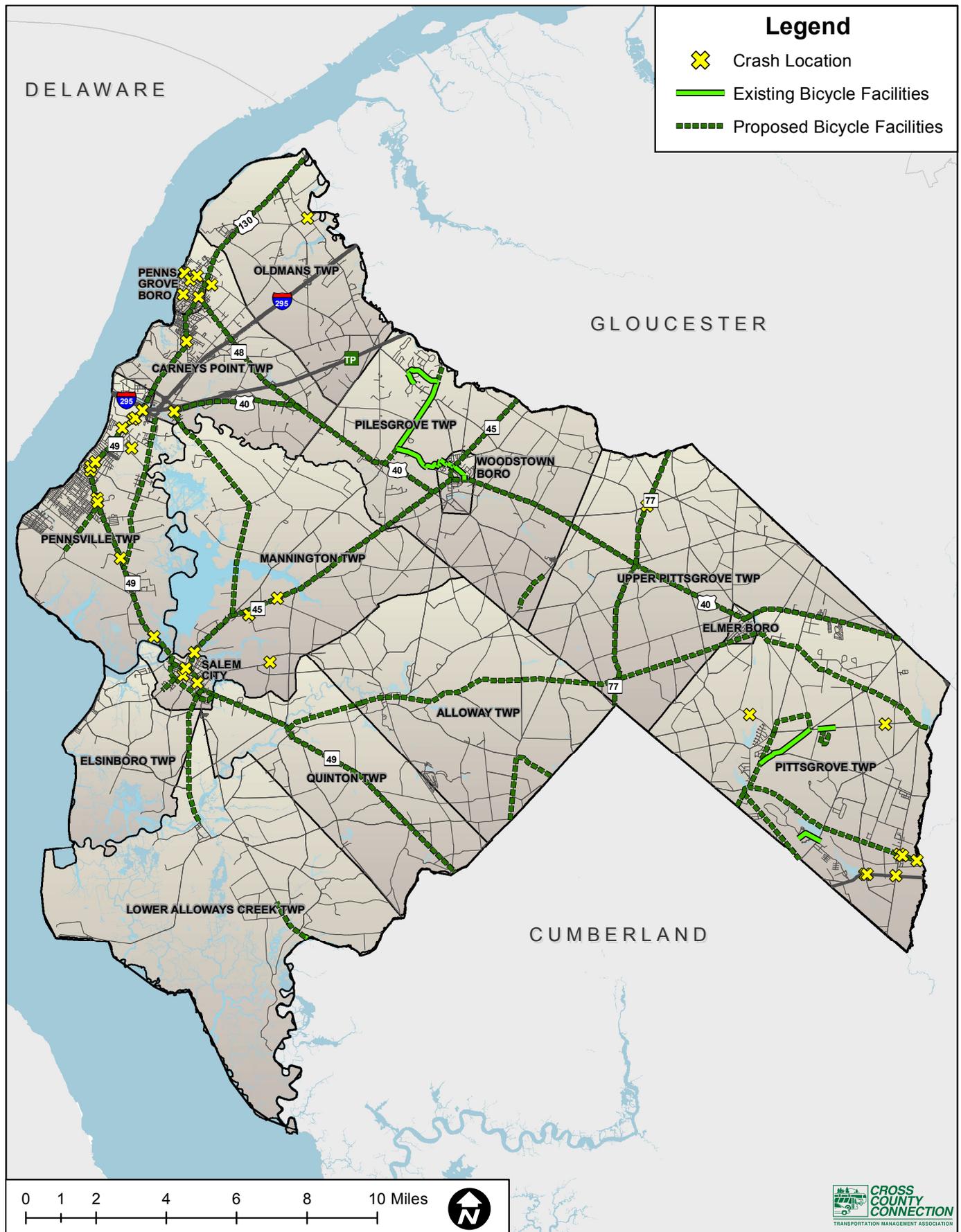
Speed Limit (MPH)	Crashes	Injuries	Fatalities
25	17	11	0
30	1	0	0
35	8	7	0
40	4	3	1
45	3	3	0
50	13	10	0
55	1	1	0
<b>Total</b>	<b>47</b>	<b>35</b>	<b>1</b>

Note: Table includes only crashes reported with a posted speed limit.

- 14 Bicycle Transportation Alliance, "Bicycling Perceptions and Experiences in Oregon and Southwest Washington" (2009), accessed on 5/3/2012, <http://bikeportland.org/wp-content/uploads/2009/10/btasurvey.pdf>.
- 15 U.K. Department for Transport, *Climate Change and Transport Choices: Segmentation Study Final Report* (2011), accessed 5/3/2012, <http://assets.dft.gov.uk/publications/climate-change-transport-choices/segmentation-study-final-report.pdf>.
- 16 Chen et al, "Evaluating the Safety Effects of Bicycle Lanes in New York City," *American Journal of Public Health* (2012): e1-e8, accessed on 5/2/2012, <http://www.ncbi.nlm.nih.gov/pubmed/22095351>.
- 17 Reynolds et al, "The impact of transportation infrastructure on bicycling injuries and crashes: a review of the literature," *Environmental Health* (2009): 8-47, accessed on 5/3/2012, <http://www.ehjournal.net/content/8/1/47>.

# Map 8: Bicycle Collisions in Salem County, 2007-2011

Salem County Bicycle Facilities Inventory & Analysis, September 2012



## 3.5 Bicycle Safety Programming

Education, enforcement and encouragement programs work in tandem with infrastructure improvement efforts to create more bicycle friendly places. These programs help increase the use and safety of bicycle infrastructure, and in doing so multiply the benefits generated by infrastructure investments.

### 3.5.1 Local Programs

Four municipalities reported having local bicycle safety programs in their area: Elsinboro, Lower Alloways Creek, Pilesgrove and Pittsgrove Townships. All of these programs focus on educating children about bicycle safety. Pilesgrove Township has worked with the Salem County Sheriff's Department, New Jersey State Police and school staff on bicycle safety programs for schoolchildren. Elsinboro Township, along with the Lower Alloways Creek Police Department, also held a "Caught You Being Safe" campaign in 2011 that rewarded bicycle riders for wearing their helmet. Lower Alloways Creek has held similar programs in its township, including working with school staff to teach bicycle safety and proper helmet use to children. Pittsgrove Township holds an annual bicycle rodeo that teaches safe riding behavior and helmet use.

### 3.5.2 Regional Programs

In addition to local efforts, several organizations are active in the county and offer safety programs and assistance:

#### Traffic Safety Resource Center

The Traffic Safety Resource Center, (TSRC) affiliated with CAIT, provides training, technical assistance, engineering and other services to local transportation safety agencies. In October 2011, the Traffic Safety Resource Center conducted a Road Safety Audit of intersections with high crash volumes in Pittsgrove and Upper Pittsgrove Townships.

#### Cross County Connection Transportation Management Association

Cross County Connection is a state-funded nonprofit that provides technical, planning and safety program assistance to municipalities, counties, schools and community organizations to improve the safety of bicycle travel in southern New Jersey. Assistance areas include bicycle infrastructure planning and local bicycle program development.

#### South Jersey Traffic Safety Alliance

The South Jersey Traffic Safety Alliance is an organization funded by the South Jersey Transportation Planning Authority and NJ Division of Highway Traffic Safety that provides information and coordinates traffic safety professionals on safety programming.

#### New Jersey Safe Routes to School

The New Jersey Safe Routes to School program is a statewide initiative to encourage and enable children to safely walk and bike to school. The program provides assistance to communities and schools to implement walking and biking programs, identify issues through travel planning and stakeholder engagement, create partnerships among diverse organizations and educate community members and professionals. Cross County Connection's Regional Safe Routes to School Coordinator offers

assistance in creating local programs in Salem County.

### 3.6 Bikeway Demand Analysis

The bikeway demand analysis performed as part of this inventory used the presence of people, shopping and employment destinations, schools, transit and other community amenities to measure demand for bicycle travel. The analysis included measures of road and intersection density by census block as a proxy for environmental characteristics that foster bike travel for transportation, such as dense road networks and short block lengths.

As shown in Map 9, the analysis has found bicycle travel demand to be highest in denser, more urban population centers such as Pennsville, Penns Grove, Carneys Point, Salem City, Woodstown and to a lesser extent Elmer. The US 130/NJ 49 corridor in which several of these municipalities are located has the highest consistent estimated bikeway demand in the county. Bikeways are proposed on this state-maintained corridor that links several of these high-demand municipalities: Pennsville, Carneys Point, Penns Grove and Salem City. The downtown areas of these municipalities, as well as Woodstown, are the highest scored areas of the analysis. Proposed bikeways link all of these high demand areas, with a notable gap between the proposed facilities on US 40 and County Roads 551 and 540, where the New Jersey Turnpike and I-295 merge before continuing west into Delaware on the Delaware Memorial Bridge.

It should be noted that this demand analysis is aimed at estimating bicycle travel demand for transportation. It does not account for the demand for destination-oriented recreational cycling, including cyclists traveling to ride the Cumberland Salem Revolution bicycle tour.

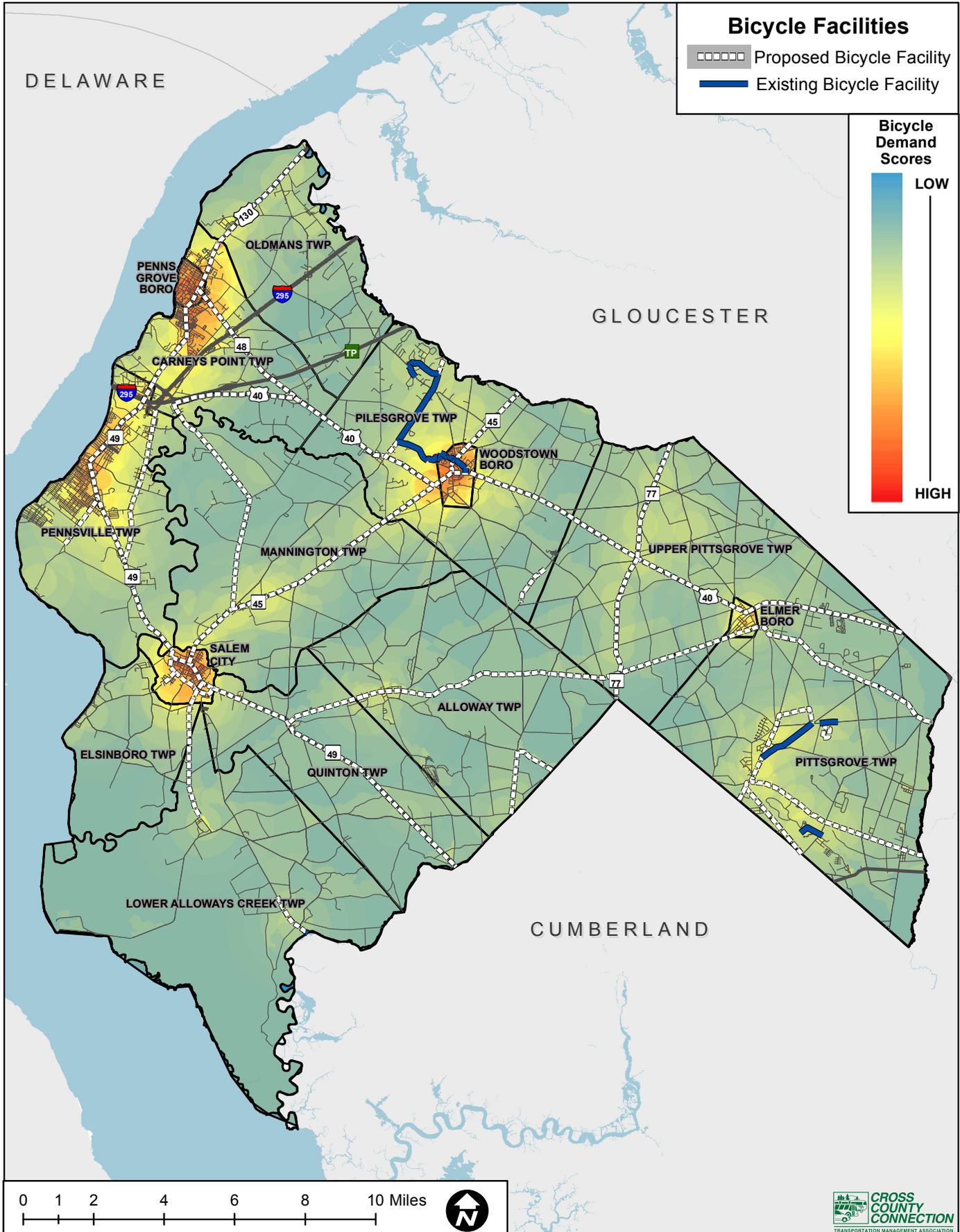
Figure 4. TSRC Audit Team, 2011



Source: TSRC

# Map 9: Salem County Bikeway Demand

Salem County Bicycle Facilities Inventory & Analysis, September 2012



## 4 Recommendations

The recommendations provided in this section are intended to prioritize construction of high value proposed bikeways that serve the transportation needs of Salem County residents, and identify communities that should be prioritized for comprehensive bicycle facility planning efforts. Recommendations are based on results of the bikeway demand analysis, field visits and analysis by Cross County Connection. Since public input was not included as part of this analysis, recommendations were limited to bikeways already proposed. These recommendations do not imply that the proposed bikeways are the most suitable or easily implemented. Local planning efforts may result in additional or alternate planned routes that may be more desirable for bicycle travel.

### 4.1 High Priority Proposed Bikeways

In determining what priority to place on proposed bikeways in the county, Cross County Connection performed a raster-based GIS analysis to estimate bicycle travel demand based on seven trip attractor and generator factors. This raster analysis divides the county into ten meters squares, in which the weighted demand score of each factor in the square is added to reach a demand score for that area. Demand factors included:

- Population density - Number of residents per square mile by census block. While not necessarily a causal factor for cycling rates, higher population density means that more potential cyclists will have access to constructed bikeways.
- Households without access to an automobile - Number of households without automobile access per square mile by census tract. Households without automobiles are often low income and have reduced access to employment and other destinations due to limited transit and active transportation options. Not only are residents of these households more likely to travel by bicycle, they are also likely to derive the greatest safety and mobility benefits of new bikeways.
- Transportation network connectivity - Number of intersections and roadway mileage per square mile by census block. Dense road networks with a high level of connectivity, such as grid networks, offer greater accessibility and more route choices to cyclists.
- Transit connectivity - Proximity to NJ TRANSIT bus stops, measured in ½ mile increments (e.g. within 1/2 mile, 1 mile, 1 1/2 miles, 2 miles) up to a two straight-line mile radius. Transit access increases the viability of cycling as transportation by allowing users to travel farther than they can bike and avoid barriers that would otherwise prevent them from biking the trip.
- Trip attractors - Proximity to destinations such as schools, colleges, libraries, parks, museums, hospitals and places of worship, measured in ½ mile increments up to a two straight-line mile radius. These destinations attract bicycle traffic for daily and recreational travel. Schools and colleges in particular attract bicycle traffic from young people who do not have access to a car or are unable to drive.
- Employment location density - Number of businesses employing 10 or more people per square mile by census block. These employment locations include retail businesses that also attract customer travel.
- Existing bicycle facilities - Proximity to existing bicycle facilities, measured in ½ mile increments up to a two straight-line mile radius. A viable bicycle network requires bikeways that are connected

with minimal gaps. Constructing bikeways near existing bicycle infrastructure adds value not only to the areas it serves, but to the greater bicycle network.

These factors were weighted based on their estimated impact on bicycle travel demand and assigned numeric values according to a variable's magnitude or proximity to its location. Weighting of these demand factors is outlined in Table 2. Segments of proposed bikeways were selected based on the estimated travel demand of areas within a straight-line radius of two miles adjacent to the proposed bikeway. Demand scores were then determined for these segments by normalizing the sum of all weighted demand values in the two-mile radius of the proposed bikeway. Additional details about the ranking methods can be found in Appendix B.

Based on demand scores, segments were assigned a priority level of high or low. Table 7 shows high priority proposed bikeways in Salem County. Demand scores are represented as standardized z-scores for easier comparison. A few demand scores were over- or undervalued due to their location near, but not directly serving, a high demand location and are accounted for in their priority classification. Map 10 shows the location of proposed bikeways in the county by priority.

The majority of proposed bikeways designated high priority are located in the US 130 / NJ 49 corridor in the western area of the county. All of the high priority proposed bikeways are located on roads maintained by the State of New Jersey.

Cross County Connection recommends that these high priority segments receive primary consideration for bikeway construction in the county to maximize the benefit to Salem County residents and area cyclists.

**Table 7: High Priority Proposed Bikeway Segments, Salem County**

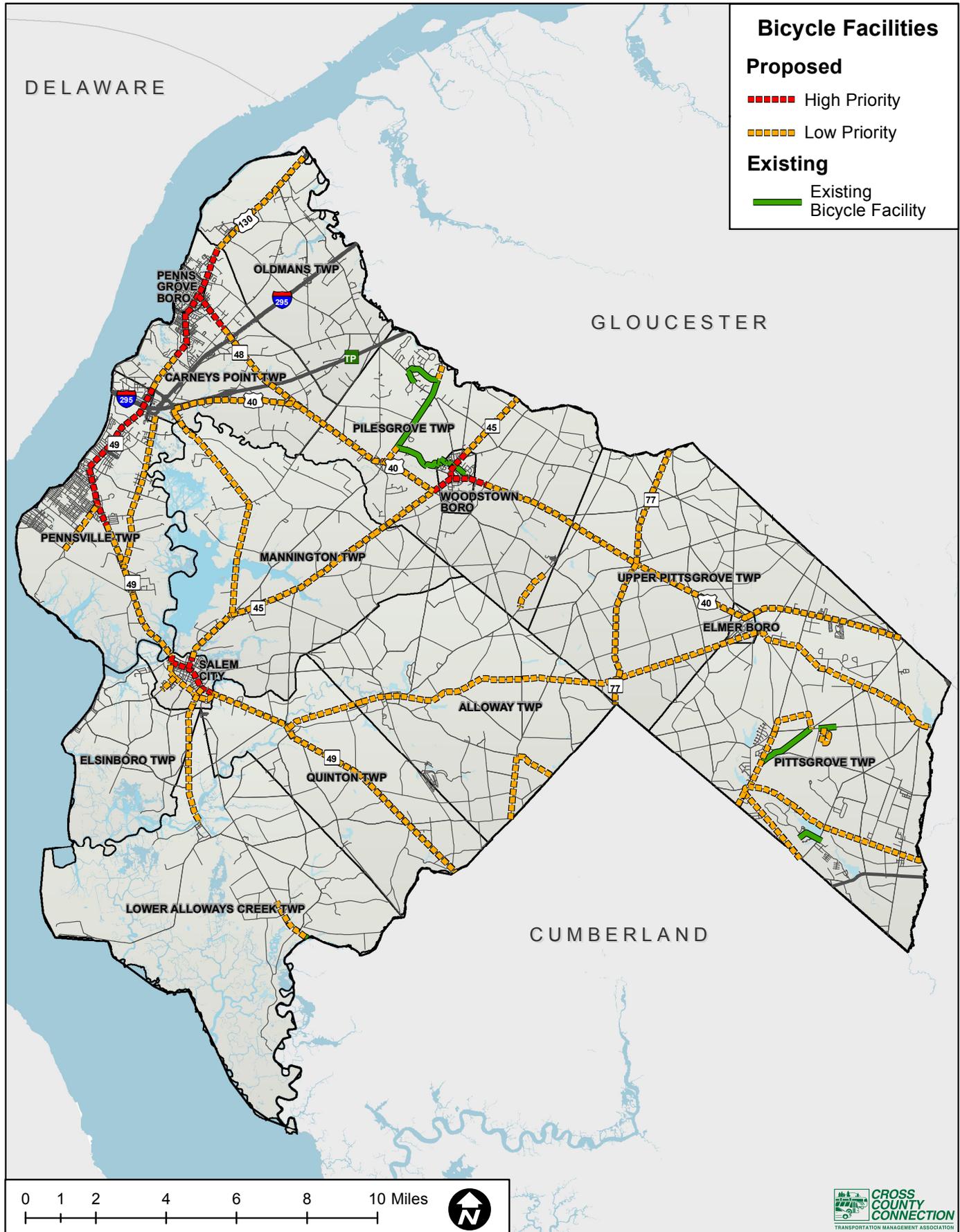
Priority	Roadway	Segment	Segment Length (Miles)	Standardized Demand Score	Municipality
High	US 130 / NJ 49	NJ 140 to NJ 130	0.68	1.97	Carneys Point Township, Pennsville Township
High	NJ 48	US 130 to North Golfwood Avenue	1.21	1.85	Carneys Point Township, Penns Grove Township
High	US 130	North Broad Street to Springfield Avenue	3.43	1.75	Carneys Point Township, Penns Grove Borough
High	NJ 49	Old Pennsville-Auburn Road to Paterson Avenue	3.97	1.47	Carneys Point Township, Pennsville Township
High	NJ 45	Salem 616 to Bypass Road	0.88	1.22	Woodstown Borough, Pilesgrove Township
High	NJ 45	Hancock Street to East Broadway	0.33	0.93	Salem City
High	US 40	East Lake Road to Salem 616	1.65	0.82	Woodstown Borough, Pilesgrove Township
High	NJ 49	Griffith Street to Grieves Parkway	1.76	0.29	Salem City
Low	US 130	Springfield Avenue to NJ 140	1.10	2.45	Carneys Point Township
Low	Fort Mott Road	NJ 49 to Industrial Park Road	0.94	1.38	Pennsville Township
Low	Fort Mott Road	Industrial Park Road to Lehigh Road	0.65	1.13	Pennsville Township
Low	Route 45	High Bridge Bypass Road to County Line (North)	2.16	0.98	South Harrison Township, Harrison Township
Low	US 130	North Broad Street to Pennsgrove Pedricktown Road	0.95	0.97	Oldmans Township
Low	South Front Street	NJ 49 to Salem 625	0.48	0.79	Salem City
Low	Salem County 625	Grieves Parkway to Delaware Drive	0.51	0.75	Salem City
Low	Salem County 551	Old Pennsville-Auburn Road to NJ 49	4.44	0.74	Pennsville Township
Low	Yorke Street	NJ 49 to Glen Ridge Avenue	0.51	0.62	Salem City
Low	NJ 49	Paterson Ave to Harrisonville Lighthouse Road	2.11	0.49	Pennsville Township
Low	NJ 40	Sharptown Auburn Road to NJ 45	1.96	0.49	Pilesgrove Township
Low	NJ 45	Hancock Street to Pointers Auburn Road	1.67	0.48	Salem City, Mannington Township
Low	Route 49	Lighthouse Road to County Highway 657	2.11	0.47	Pennsville Township, Salem City, Quinton Township

Priority	Roadway	Segment	Segment Length (Miles)	Standardized Demand Score	Municipality
Low	NJ 45	US 40 to Haines Neck Road	2.07	0.45	Pilesgrove Township
Low	Salem County 620	Marlton Road to Route 40	0.62	0.43	Pilesgrove Township
Low	Fort Mott Road	Lehigh Road to Issac Drive	3.86	0.41	Pennsville Township, Salem City, Elsinboro Township, Lower Alloways Creek Township
Low	Grievess Parkway	NJ 49 to Oak Street	1.40	0.34	Salem City
Low	Salem County 553	Morton Avenue to County Line	0.40	0.18	Pittsgrove Township
Low	Route 48	Route 40 to Golfwood Avenue	3.32	0.10	Carneys Point Township
Low	Route 130	Pennsgrove Pedricktown Road to County Line	2.66	0.03	Oldsman Township, Carneys Point Township, Pennsville Township, Penns Grove Borough
Low	Morton Avenue	Centernton Road to County Highway 645	2.45	-0.03	Pittsgrove Township
Low	Route 40	Hawks Bridge Road to Sharptown Auburn Road	6.38	-0.07	Carneys Point Township, Woodstown Borough, Pilesgrove Township, Upper Pittsgrove Township, Elmer Borough, Pittsgrove Township
Low	Salem County 620	Laurel Lane to County Line	0.39	-0.12	Pilesgrove Township
Low	Route 40	East Lake Road to Garrison Road	7.99	-0.28	Carneys Point Township, Woodstown Borough, Pilesgrove Township, Upper Pittsgrove Township, Elmer Borough, Pittsgrove Township
Low	Salem County 553	Morton Avenue to Salem 690	1.98	-0.28	Pittsgrove Township
Low	Hawks Bridge Road	Route 40 to Pointers Auburn Road	3.33	-0.32	Carneys Point Township, Mannington Township
Low	Hancocks Bridge Road	Glen Ridge Avenue to Poplar Street	3.95	-0.44	Salem City
Low	Salem County 540	Centernton Road to County Line	5.38	-0.51	Pittsgrove Township
Low	Route 45	County Highway 631 to Pointers Auburn Road	4.71	-0.52	Salem City, Mannington Township, Pilesgrove Township
Low	County 553 - Mckishen Road - Lawrence Corner Road	County Highway 690 north to McKishen Road, south on Lawrence Corner Road to County 690	1.65	-0.58	Pittsgrove Township

Priority	Roadway	Segment	Segment Length (Miles)	Standardized Demand Score	Municipality
Low	Green Branch Park	N/A	0.99	-0.60	Pittsgrove Township
Low	Route 77	Route 40 to County Line (North)	3.38	-0.67	Upper Pittsgrove Township
Low	NJ 40	Garrison Road to North Main Street	0.37	-0.77	Elmer Borough
Low	Route 49	Grievess Parkway to County Line	8.74	-0.81	Pennsville Township, Salem City, Quinton Township
Low	Pointers Auburn Road	Marshalltown Road to Route 45	3.19	-0.87	Mannington Township
Low	Salem County 639	Main Street to County Line	5.73	-1.00	Pittsgrove Township
Low	Route 40	Main Street to County Line	4.56	-1.04	Carneys Point Township, Woodstown Borough, Pilesgrove Township, Upper Pittsgrove Township, Elmer Borough, Pittsgrove Township
Low	Route 77	Route 40 to County Line (South)	4.18	-1.04	Upper Pittsgrove Township
Low	Salem County 611	County Highway 635 to Main Street	6.20	-1.21	Alloway Township, Upper Pittsgrove Township, Elmer Borough
Low	Salem County 581	Route 49 to Elkinton Road	2.23	-1.30	Quinton Township
Low	Salem 581/611 (Main St Alloway)	Elkinton Road to East Canal Street	1.12	-1.31	Alloway Township
Low	Salem County 611	County Highway 635 to East Canal Street	4.42	-1.43	Alloway Township
Low	Salem County 581	County Highway 614 to between Robbins Road and County Highway 615	1.20	-1.47	Pilesgrove Township
Low	Salem County 640	Friesburg Deerfield Road to County Line	2.95	-1.57	Alloway Township
Low	Salem County 623	County Line to near Church Road	1.35	-1.67	Lower Alloways Creek Township

# Map 10: Salem County Bikeways by Priority

Salem County Bicycle Facilities Inventory & Analysis, September 2012



### 4.1.1 High Priority Proposed Bikeways

Descriptions, attributes and implementation details for the eight high priority proposed bikeways identified in the bikeway demand analysis are provided in Tables 8 through 15.

**Table 8. US 40 (Salem County 616 to East Lake Road)**

Description		
<p>US 40 is a primary commercial corridor in Woodstown Borough. The proposed bikeway segment is located adjacent to Woodstown-Pilesgrove Library, Woodstown High School, Woodstown-Pilesgrove Middle School and connects to an existing bike route on School Lane. The proposed bikeway also connects residents to 12 businesses, each employing between 10 and 20 people.</p>		
Facility Type	Length	Jurisdiction
Bike lane, shared lane	1.65 miles	State
Municipalities		
Woodstown Borough, Pilesgrove Township		
Implementation		
<p>NJDOT design guidelines recommend at minimum, shared lane treatments between Green Street and Wilson Avenue, and 5'-6' bike lanes between Wilson Avenue and East Lake Road. Bike lanes may be preferable for the entire length of the segment due to high truck and traffic volumes (&gt;15,000 AADT). There is sufficient right of way between Green Street and Richman Street to stripe bike lanes and maintain existing 12' vehicle lane widths, however on-street parking would need to be removed from at least one side of the street for the installation. 4' shoulders are present on US 40 from Salem County 616 to Green Street, and Kresswold Lane to East Lake Road. There is sufficient pavement width at present to stripe bike lanes at minimum recommended widths on these segments, however vehicle lane widths will need to be reduced by 1'-2' to accommodate the installation of the lanes.</p>		
Transit Connections		
NJ TRANSIT 401, 468 bus		
<p><b>Legend</b></p> <ul style="list-style-type: none"> <li><span style="color: blue;">▬▬▬</span> High Priority Bikeway</li> <li><span style="color: grey;">▬▬▬</span> Existing Bicycle Facility</li> <li><span style="color: brown;">▬▬▬</span> NJ TRANSIT Bus</li> <li><span style="border: 1px solid black; display: inline-block; width: 10px; height: 10px;"></span> Municipal Border</li> <li> Library</li> <li> School</li> <li> Park</li> </ul>	<p>NJ 49 and School Lane</p>	

**Table 9. NJ 45 (US 40 to Bypass Road)**

**Description**  
 NJ 45 is another primary commercial corridor in Woodstown Borough. Bike lanes are currently installed on a small section of the roadway from Elm Street to Harris Street. The proposed bikeway segment would connect to the existing bike lanes on Elm Street and bike route on Harris Street that continues to Marlton Park and other areas in Pilesgrove Township. The proposed segment links many businesses and residents located on NJ 45 to US 40, the primary travel corridor in Woodstown Borough.

Facility Type	Length	Jurisdiction
Bike lane, shared lane	0.88 miles	State

**Municipalities**  
 Woodstown Borough, Pilesgrove Township

**Implementation**  
 NJDOT design guidelines recommend at minimum, shared lane treatments between US 40 and Grant Street, however bike lanes may be preferable due to traffic volume (>7,000 AADT). A 5' bike lane is recommended between Grant Street and the 50MPH speed zone approximately 1/10th of a mile south of Bypass Road. There is sufficient pavement at present on the entire segment to stripe bike lanes at minimum recommended widths, with the exception of a constrained railroad crossing overpass between Folwell Street and Bypass Road (shown below). On-street parking is currently permitted at most locations on NJ 45 from US 40 to Folwell Street, and would need to be removed from at least one side of the street to install bike lanes.

**Transit Connections**  
 NJ TRANSIT 401, 468 bus

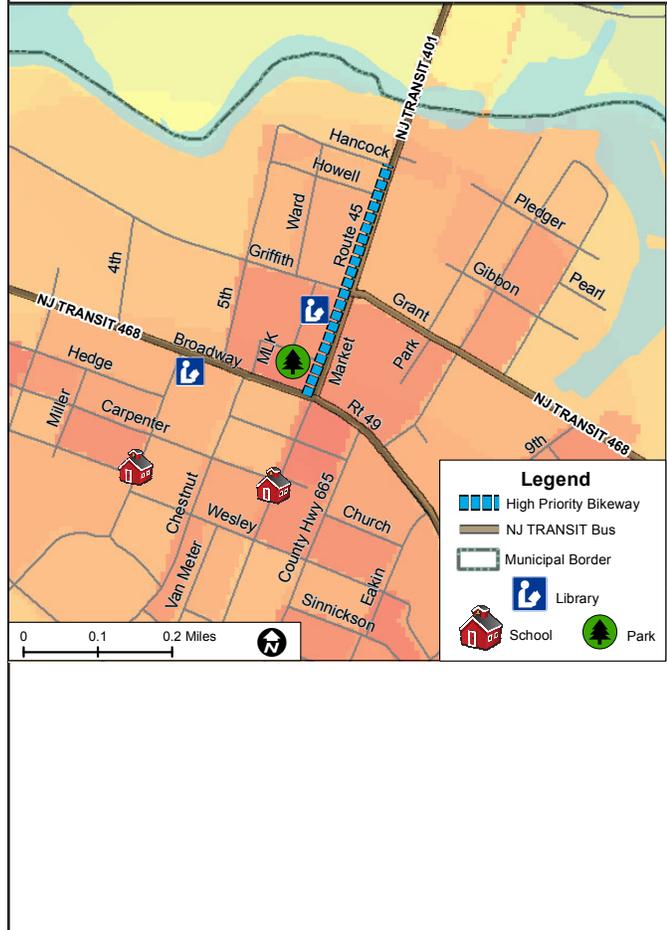


**Table 10. NJ 45 (Hancock Street to East Broadway)**

Description		
<p>This short segment connects residents to several Salem County offices, including the Office on Aging, Election Board, the County’s Summer Youth Employment Program and the NJ Motor Vehicle Commission. The proposed bikeway would also connect to the MLK Mini Park which holds many outdoor community events throughout the year.</p>		
Facility Type	Length	Jurisdiction
Bike lane, shared lane	0.33 miles	State
Municipalities		
Salem City		
Implementation		
<p>NJDOT design guidelines recommend a shared lane treatment on this segment, however bike lanes may be preferable due to the high volume of traffic (&gt;9,000 AADT). There is sufficient pavement width at present to stripe bike lanes on this segment, however currently permitted on-street parking would need to be removed from at least one side of the street to install the lanes.</p>		

**Transit Connections**

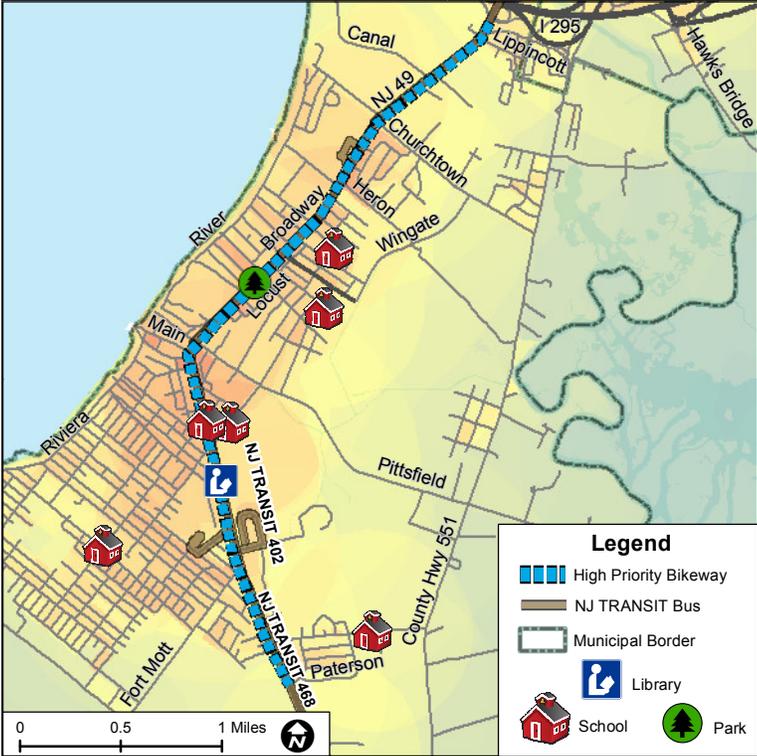
NJ TRANSIT 401, 468 bus; Salem to Bridgeton Pilot Shuttle



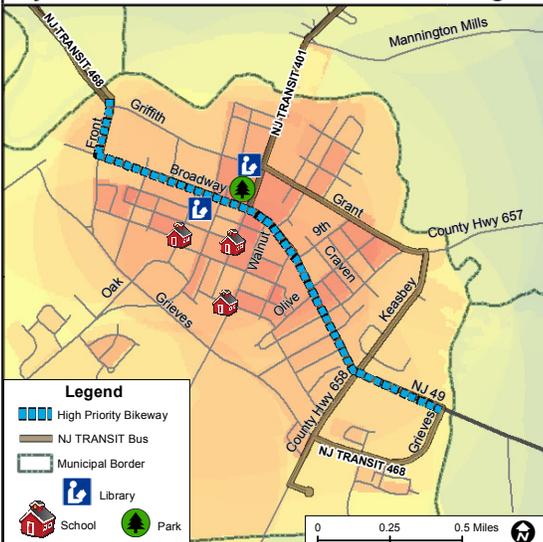
**Table 11. NJ 48 (US 130 to Golfwood Avenue)**

Description		
<p>This proposed bikeway is located adjacent to the Penns Grove High School and a large senior apartment complex. Several employment locations are located adjacent to this segment, including five locations employing between 20 and 50 people.</p>		
Facility Type	Length	Jurisdiction
Bike lane, shared lane	1.21 miles	State
Municipalities		
Carneys Point Township, Penns Grove Borough		
Implementation		
<p>NJDOT design guidelines recommend at minimum, 5' bike lanes from Miller Avenue to the 50MPH speed zone approximately 2/10ths of a mile east of Dupont Road; 6' bike lanes for the length of that 50MPH speed zone to Golfwood Ave; and shared lane treatments from US 130 to Miller Avenue. Bike lanes may be preferable for the length of the proposed segment due to traffic volumes on the roadway (&gt;7,000 AADT). Between US 130 and Miller Avenue, pavement width of NJ 48 is 30', and increases to 32' from Miller Avenue to Golfwood Avenue. There is sufficient pavement width at present to stripe bike lanes at minimum recommended widths for the length of this segment, however vehicle lane widths will need to be reduced by 1'-2' from Miller Avenue to East Lake Road to accommodate the installation of the lanes.</p>		
Transit Connections		
NJ TRANSIT 468 bus		
		<p style="text-align: center;">NJ 48 and Dupont Road</p>
		<p style="text-align: center;">NJ 48 and Penns Grove High School</p>

**Table 12. NJ 49 (Old Pennsville-Auburn Road to Paterson Avenue)**

Description		
<p>This segment of NJ 49 is the central commercial and travel corridor for Pennsville Township. The proposed bikeway directly accesses Riverview Beach Park, the Pennsville Public Library and Pennsville Memorial High School. The proposed facility is also located adjacent to 27 employment locations with more than 20 employees and many shopping destinations. Three additional schools: Central Park Elementary, Park Bible Academy and Pennsville Middle School are within a ½ mile of the proposed bikeway.</p>		
Facility Type	Length	Jurisdiction
Bike lane	3.97 miles	State
Municipalities		
Carneys Point Township, Pennsville Township		
Implementation		
<p>NJDOT design guidelines recommend a minimum bike lane width of 5' for this proposed bikeway. Shoulders are present on both sides of the roadway, ranging from 3' to 4.5' from Lippincott Avenue to Paterson Avenue. The posted speed limit for the length of this segment varies from 35-40MPH. A reduction in vehicle lane widths of 1.5' - 2' or road widening will be needed to install bike lanes on this segment.</p>		
Transit Connections		
NJ TRANSIT 402, 468 bus		
 <p>The map shows the proposed high-priority bikeway (blue dashed line) along NJ 49. Key features include:                 <ul style="list-style-type: none"> <li><b>High Priority Bikeway:</b> Indicated by a blue dashed line along the main road.</li> <li><b>NJ TRANSIT Bus:</b> Shown as a brown line with a bus icon, following the road.</li> <li><b>Landmarks:</b> Red house icons represent schools (Central Park Elementary, Park Bible Academy, Pennsville Middle School). A green tree icon represents Riverview Beach Park. A blue building icon represents the Pennsville Public Library.</li> <li><b>Geography:</b> The map shows the Delaware River to the west, the Canal to the north, and various streets including Broadway, Heron, Wingate, Lippincott, Churchtown, Pittsfield, and Paterson.</li> <li><b>Scale and Orientation:</b> A scale bar shows 0, 0.5, and 1 mile. A north arrow is also present.</li> </ul> </p>		
		 <p>The photograph shows a wide, multi-lane asphalt road (NJ 49) with a grassy shoulder on the right. A speed limit sign for 35 MPH is visible on the right side of the road. The sky is overcast.</p>

**Table 13. NJ 49 (Griffith Street to Grieves Parkway)**

Description		
<p>Salem City has a large share of residents commuting by bicycle, a significant number of residents without access to a motor vehicle and a sizeable low-income population. NJ 49 is the city's main commercial corridor. This proposed bikeway segment connects Salem City residents to the Salem Free Public Library, Salem County Historical Society Research Library, United Way, Post Office and many shopping and dining destinations. The proposed bikeway is located within ½ mile of three schools: St. Mary's Regional School, John Fenwick Elementary and Salem Middle School. Several businesses employing significant numbers of people are located adjacent to the proposed bikeway, including six that employ over 20 people and one employing over 100.</p>		
Facility Type	Length	Jurisdiction
Bike lane, shared lane	1.76 miles	State
Municipalities		
Salem City		
Implementation		
<p>NJDOT bikeway design guidelines recommend at minimum, shared lanes from Griffith Street to Salem County 658, and 5' bike lanes from Salem County 658 to Grieves Parkway. Bike lanes may be preferable for the length of this proposed bikeway due to high traffic volumes (approx. 9,900 AADT). This proposed bikeway does not have shoulders and currently has on-street parking on both sides of the street between South Front Street and Salem County 658. The posted speed limit from Griffith Street to Salem County 658 varies between 25-30MPH, raising to 35MPH from Salem County 658 to Grieves Parkway. Sufficient pavement width exists at present to designate bike lanes on this entire segment, however currently permitted on-street parking would need to be removed from at least one side of the street to install the lanes between NJ 45 and Walnut Street and between Olive Street and Salem County 658.</p>		
Transit Connections		
NJ TRANSIT 401, 468 bus; Salem to Bridgeton Shuttle		
		<p>NJ 49 and NJ 45</p> 

**Table 14. US 130 / NJ 49 (US 40 to Hawks Bridge Road)**

Description		
<p>This segment of the proposed US 130 bikeway crosses I-295, connecting urban areas of Pennsville to Carneys Point, and accesses the Deepwater community in Pennsville Township. The I-295 crossing presents a significant barrier to the safety and mobility of bicycle travel, and a crossing of the interstate roadway is an important link in the regional bikeway network.</p>		
Facility Type	Length	Jurisdiction
Bike lane, bike path	0.68 miles	State
Municipalities		
Carneys Point Township, Pennsville Township		
Implementation		
<p>NJDOT design guidelines recommend at minimum, 5' bike lanes on this proposed segment north of Canal St. 4' shoulders are present on both sides of the roadway north of Canal St. South of Canal St. the shoulders are dropped at the I-295 interchange. The posted speed limit of north of Canal St. is 35MPH. A reduction in vehicle lane widths or road widening will be needed to install bike lanes on this segment. Further study is needed to determine feasible design solutions for the crossing of I-295.</p>		
Transit Connections		
NJ TRANSIT 402, 468 bus		



**Table 15. US 130 (North Broad Street to Springfield Avenue)**

Description		
<p>This proposed segment is a central travel and commercial corridor through Penns Grove Borough and adjacent developed areas of Carneys Point Township. Three elementary schools, Penns Grove Middle School, Penns Grove High School and Salem Community College are located within ¾ mile of the proposed segment. The segment also connects to the Salem County Board of Social Services, Dunns Park, and is within one mile of Carneys Point Care Center, which employs over 100 people. The proposed bikeway is also located within one mile of over 20 other businesses, each employing between 20 and 50 people.</p>		
Facility Type	Length	Jurisdiction
Bike lane,	3.43 miles	State
Municipalities		
Carneys Point Township, Penns Grove Borough		
Implementation		
<p>NJDOT design guidelines recommend at minimum, 6' bike lanes from N Broad St. to Salem County 641, and from Springfield Ave. to the 35MPH speed zone located approximately 3/10ths of a mile to the north; and 5' bike lanes from Salem County 641 to the 50MPH speed zone 2.1 miles to the south. 9' shoulders on each side of US 130 exist in Penns Grove and the portion of the proposed facility north of Penns Grove. There is sufficient pavement width at present to stripe bike lanes from N Broad St. to Laurel Rd. Vehicle lane widths will need to be reduced by 1'-2' or the roadway widened to accommodate bike lane installation between Laurel Rd. and Springfield Ave. Buffering of bike lanes should be considered where pavement width permits to provide greater shy distance from truck and vehicle traffic.</p>		

**Transit Connections**

NJ TRANSIT 402, 468 bus

US 130 and Pine Street

US 130 and Harrison Street

## 4.2 Priority Planning Areas

Planning for bicycle facilities is key to efficiently creating a comprehensive bicycle network. Whether incorporated into the municipal master plan circulation element or as a standalone bicycle master plan, bicycle planning documents provide a long term vision for the bicycle transportation network. This vision guides the efficient use of public dollars towards construction of high value bikeways that serve the needs of residents and further the municipality’s long term goals.

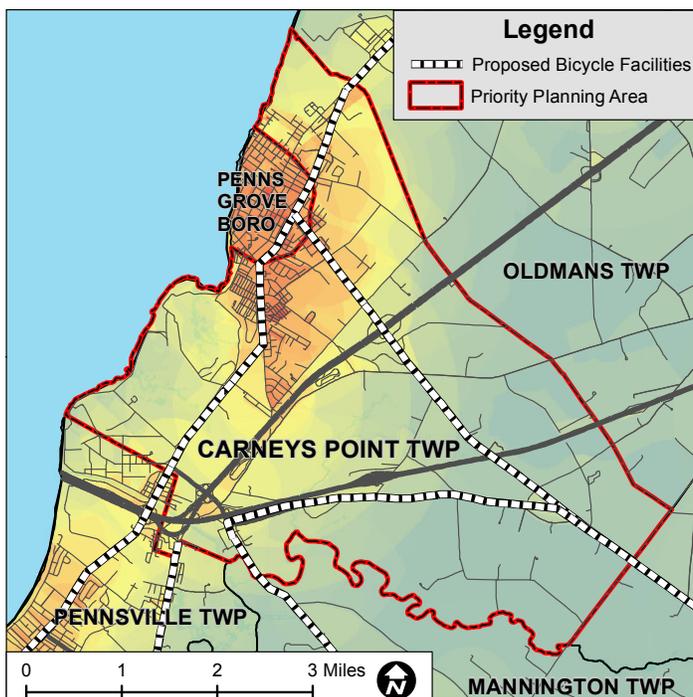
Currently, Pittsgrove Township is the only Salem County municipality that incorporates bicycle facilities into municipal planning documents. It is recommended that all municipalities in Salem County accommodate bicycle travel into relevant planning activities and documents including master plans, site and redevelopment planning, subdivision codes, site plan requirements and other municipal planning and regulatory processes.

Four municipalities were identified as having a high relative need for bicycle planning efforts. These priority planning areas have the potential for significant bicycle travel volumes based on bikeway demand analysis findings, and currently none of them have documents or significant policies that specifically accommodate bicycle travel. Cross County Connection recommends that each of the following municipalities be prioritized for comprehensive bicycle facility planning:

### Carneys Point Township

Much of the population, employment and development in Carneys Point, shown in Map 11, is concentrated in the northwestern area of the township, near the Penns Grove Borough line. The township has a relatively low population and jobs density as a whole, as shown in Table 16, but areas in the northwest portion of the municipality represent an excellent opportunity to improve safety and connectivity for bicycle travel.

**Map 11: Carneys Point Township**



**Table 16: Carneys Point Township Statistics**

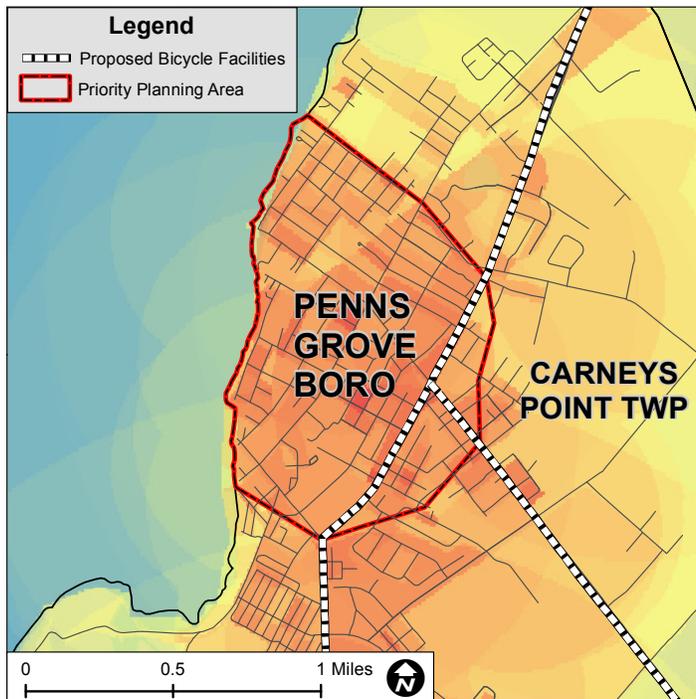
Municipal Overview	
Population	8,049
Area	16.9 sq. mi.
Population density	476 persons / sq. mi.
Jobs density	21.1 jobs / sq. mi.
Median household income	\$51,277
Percent of employed residents working in the township	10.8%
Percent of workers commuting by “other means” (incl. bicycle)	0.8%
Transit service	NJT Bus Routes 402, 468

Source: U.S. Census Bureau, 5-year ACS Estimates & LEHD Origin-Destination Employment Statistics, Accessed on 6/11/12, <http://onthemap.ces.census.gov/>.

Penns Grove Borough

Penns Grove Borough, shown in Map 12, is a small municipality on the Delaware River that is bordered on its east, south and north by Carneys Point Township. The borough is densely developed and small enough that all residents are within bikeable distance of destinations within the municipality. Penns Grove has a low median household income, as shown in Table 17, underscoring the importance of providing safe bicycle accommodations as part of an equitable transportation network.

**Map 12: Penns Grove Borough**



**Table 17: Penns Grove Borough Statistics**

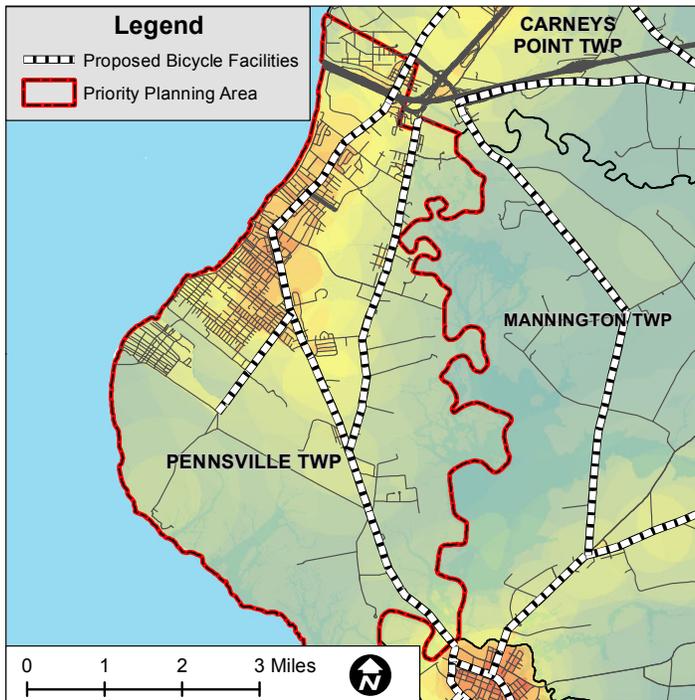
Municipal Overview	
Population	5,147
Area	0.9 sq. mi.
Population density	5,719 persons/ sq. mi.
Jobs density	776 jobs / sq. mi.
Median household income	\$30,104
Percent of employed residents working in the borough	4.3%
Percent of workers commuting by "other means" (incl. bicycle)	1.6%
Transit service	NJT Bus Routes 402, 468

Source: U.S. Census Bureau, 5-year ACS Estimates & LEHD Origin-Destination Employment Statistics, Accessed on 6/11/12, <http://onthemap.ces.census.gov/>.

Pennsville Township

Pennsville, shown in Map 13, is a large township with the majority of its development located in the northwest portion of the township. Nearly 15% of those working in the township work within its borders, however only 1% of these residents choose to bike to work, shown in Table 18. Like all of the municipalities selected as priority planning areas, there are no existing bikeways within the municipality.

**Map 13: Pennsville Township**



**Table 18: Pennsville Township Statistics**

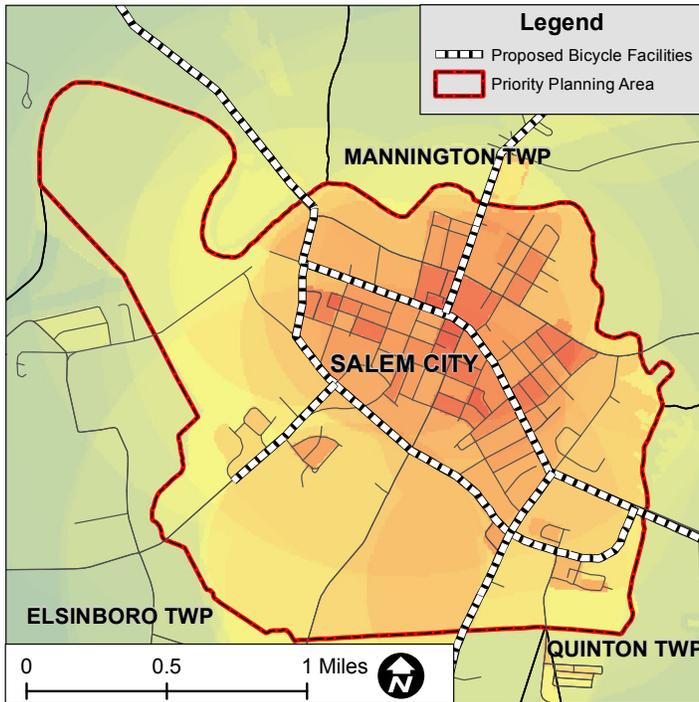
Municipal Overview	
Population	13,409
Area	23.1 sq. mi.
Population density	580 persons / sq. mi.
Jobs density	149 jobs / sq. mi.
Median household income	\$58,153
Percent of employed residents working in the township	14.8%
Percent of workers commuting by "other means" (incl. bicycle)	1.1%
Transit service	NJT Bus Routes 402, 468

Source: U.S. Census Bureau, 5-year ACS Estimates & LEHD Origin-Destination Employment Statistics, Accessed on 6/11/12, <http://onthemap.ces.census.gov/>.

Salem City

Salem, shown in Map 14 is a small, urban municipality and county seat for Salem County. A large number of Salem City’s residents are low-income, as shown in Table 19. There are also a large number of commuters currently biking to work, despite the absence of bikeways.

**Map 14: Salem City**



**Table 19: Salem City Statistics**

Municipal Overview	
Population	5,146
Area	2.6 sq. mi.
Population density	580 persons / sq. mi.
Jobs density	717 jobs / sq. mi.
Median household income	\$25,682
Percent of employed residents working in the city	12.9%
Percent of workers commuting by “other means” (incl. bicycle)	3.8%
Transit service	NJT Bus Routes 401, 468

Source: U.S. Census Bureau, 5-year ACS Estimates & LEHD Origin-Destination Employment Statistics, Accessed on 6/11/12, <http://onthemap.ces.census.gov/>.

These municipalities are all located in the western area of the county on the US 130 / NJ 49 corridors and have the four highest municipal travel demand scores in the county. They contain 48% of Salem County's population and constitute the majority of county's more densely developed urban areas. Each of these areas has a significant minority (3.8%-14.8%) of workers that both live and work in the municipality

A 2012 Salem County Transportation Survey conducted by Cross County Connection TMA<sup>18</sup> showed that 5.1% of employed respondents biked to work and that 46.1% of respondents did not currently have use of a working vehicle for transportation. Over three-fourths of survey respondents resided in these priority planning areas. 28.1% of respondents also said that transportation to work is a problem for them. Providing safe accommodations for bike travel that connect residents to destinations is essential to improving transportation equity and increasing the number of people using bikes to get to work and other daily destinations.

While a number of bikeways are proposed on US, state and county roads, including sections of the NJDOT Cumberland Salem Revolution bike tour in Salem City and Pennsville Township, local circulation for bicycle travel has not been addressed in municipal planning and transportation documents. It is recommended that each of these communities pursue and be prioritized for assistance in the creation of a bicycle master plan or non-motorized circulation element in future master plan updates.

Assistance in creating a comprehensive bicycle master plan is available through the NJDOT Local Transportation Planning Assistance Program and other funding sources listed in Section 5.2.

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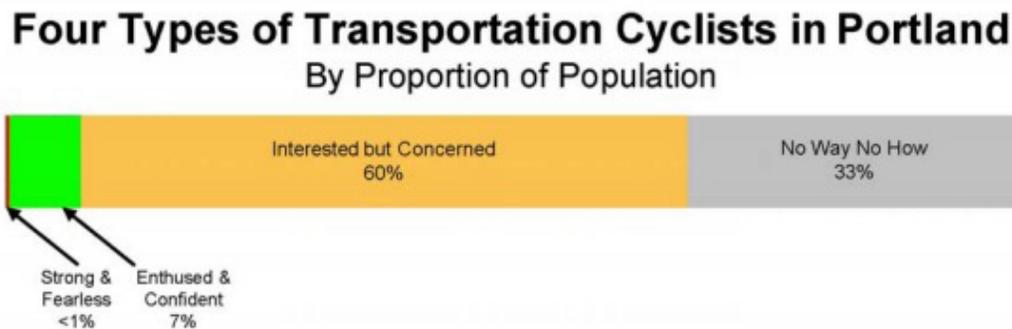
18 Cross County Connection Transportation Management Association, *Salem County Origins/Destinations Transportation Survey* (2012).

## 5 Implementation Tools

### 5.1 Facility Design

Bicycle facilities should be designed to serve the needs of cyclists and potential cyclists of varying levels of confidence, skill level and experience. A study by the Portland Office of Transportation in Portland, Oregon found that there were four general categories of bicyclists, shown in Figure 5, that use their bikes for transportation: “The Strong and the Fearless,” “The Enthused and the Confident,” “The Interested but Concerned,” and the “No Way No How.”<sup>19</sup> Only a small portion of people (<1%) are strong and fearless cyclists, while a somewhat larger, though still small, amount of people are enthused and confident (7%). However, the study found that approximately 60% of the population is interested in cycling for transportation, but chooses not to because of safety concerns. That leaves just 33% of the population that will not consider bicycling under any circumstance. Fear should not be the primary factor in choosing a travel mode, but it often is in the absence of safe accommodation for bicycling. Bicycle infrastructure should be designed with these different user groups in mind to ensure that the transportation network is inclusive and usable by the maximum number of residents.

Figure 5: Types of Cyclists in Portland, Oregon



Source: Portland Office of Transportation

#### 5.1.1 Design Guidelines

The design standards outlined in 5.1.2 show some of the options available for implementing bicycle facilities in Salem County. Please consult the design resources for bicycle facilities in New Jersey provided below for a full listing and specific details.

NJDOT Planning and Design Guidelines for Bicycle Compatible Roadways and Bikeways. NJDOT. 1996.  
<http://www.state.nj.us/transportation/publicat/pdf/BikeComp/introtofac.pdf>

NJDOT Roadway Design Manual. NJDOT. 2008.  
<http://www.state.nj.us/transportation/eng/documents/RDM/>

Guide for the Development of Bicycle Facilities. American Association of State Highway and

<sup>19</sup> Roger Geller, “Four Types of Cyclists” (2009), Portland Office of Transportation, Accessed on 5/5/12, <http://www.portlandonline.com/transportation/index.cfm?a=237507&c=44597>.

Transportation Officials (AASHTO). 2012.

<http://www.transportation.org>

Manual on Uniform Traffic Control Devices. FHWA. 2009.

[http://mutcd.fhwa.dot.gov/kno\\_2009.htm](http://mutcd.fhwa.dot.gov/kno_2009.htm)

Other design guidelines containing innovative design treatments that can currently be implemented in New Jersey can be found in the National Association of City Transportation Officials (NACTO) Urban Bikeway Design Guide:

NACTO Urban Bikeway Design Guide. National Association of City Transportation Officials. 2011.

<http://nacto.org/cities-for-cycling/design-guide/>

### 5.1.2 Facility Types

The NJDOT Planning and Design Guidelines for Bicycle Compatible Roadways and Bikeways lists three facility types:

#### Bicycle Paths

Bicycle paths are facilities separated from motorized vehicular traffic that may be located within a street right-of-way or on an independent right-of-way. These facilities typically permit two-way bicycle traffic and may be shared use with pedestrians.

Width:

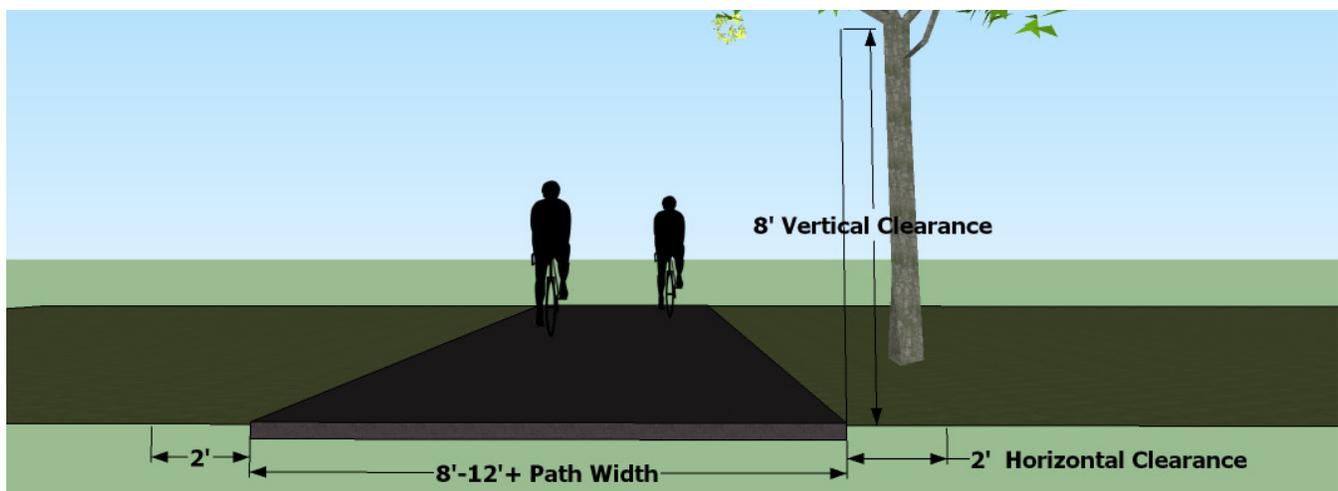
- 8' is the minimum recommended width suitable only for low facility use, very few pedestrians and having safe and frequent passing opportunities.
- 10' is recommended for paths where pedestrian use is occasional and bicycle traffic is moderate.
- 12' or greater is recommended for paths where substantial bicycle volume or probable shared use with pedestrians.

As shown in Figure 6, vertical clearance should be a minimum of 8 feet. A minimum of 2 feet of graded area should be provided for horizontal clearance from trees, poles and shrubs. Grades greater than 5 percent are undesirable. Grades greater than 5 percent and less than 500 feet are acceptable with higher design speeds and where additional path width is provided.

Where paths are provided within the street right-of-way, a wide physical separation and appropriate visual separation between the path and adjacent vehicular traffic is desirable. When this is not possible, a suitable physical divider with a minimum height of 4.5 feet may be considered where the bike path is located less than 5 feet from the edge of the roadway. This specific treatment is also called a "cycletrack."

Figure 6 shows typical bicycle path design dimensions. Many factors determine the most desirable design in context and this figure is included for illustrative purposes only. Please consult the design resources referenced in Section 5.1.1 for more information.

**Figure 6: Bicycle and Multi-use Path Design**



### Bicycle Lanes

Bicycle lanes are designated for exclusive or preferential use by bicycles through the application of pavement striping or markings and signage. The majority of existing bicycle facilities in Salem County are bicycle lanes. Figure 8 on the following page shows three cross sections of typical bike lane applications, as recommended in NJDOT guidelines.

#### Width:

- 4' is the minimum width of a bicycle lane located on streets where on-street parking is not permitted, as measured from the gutter pan joint or shoulder. A width of 5 feet or more is preferable in most instances, especially in the presence of truck traffic or higher vehicle speeds (>40 MPH).
- 5' is the minimum width of a bicycle lane where on-street parking is permitted. Additional width or buffering of 1 to 3 feet is desirable where parking volume or turnover is substantial. Where roadway width permits, 5 feet is the minimum recommended width of bicycle lanes on roadways with and without parking.

Buffered bicycle lanes, pictured in Figure 7, may be desirable on roadways with high volume, high speeds or significant parking volume or turnover. Buffering allows bicyclists to avoid door openings of parked cars, provides distance from vehicle traffic, is appealing to users of a wider range of skill level and comfort, and allows greater space to be devoted to bicycle use without drivers mistaking the bike lane for parking or a vehicular travel lane. This treatment is also useful when designating a bicycle lane in conjunction with the narrowing of motor vehicle travel lanes. MUTCD and NACTO guidance recommend a minimum buffer width of 2 feet.

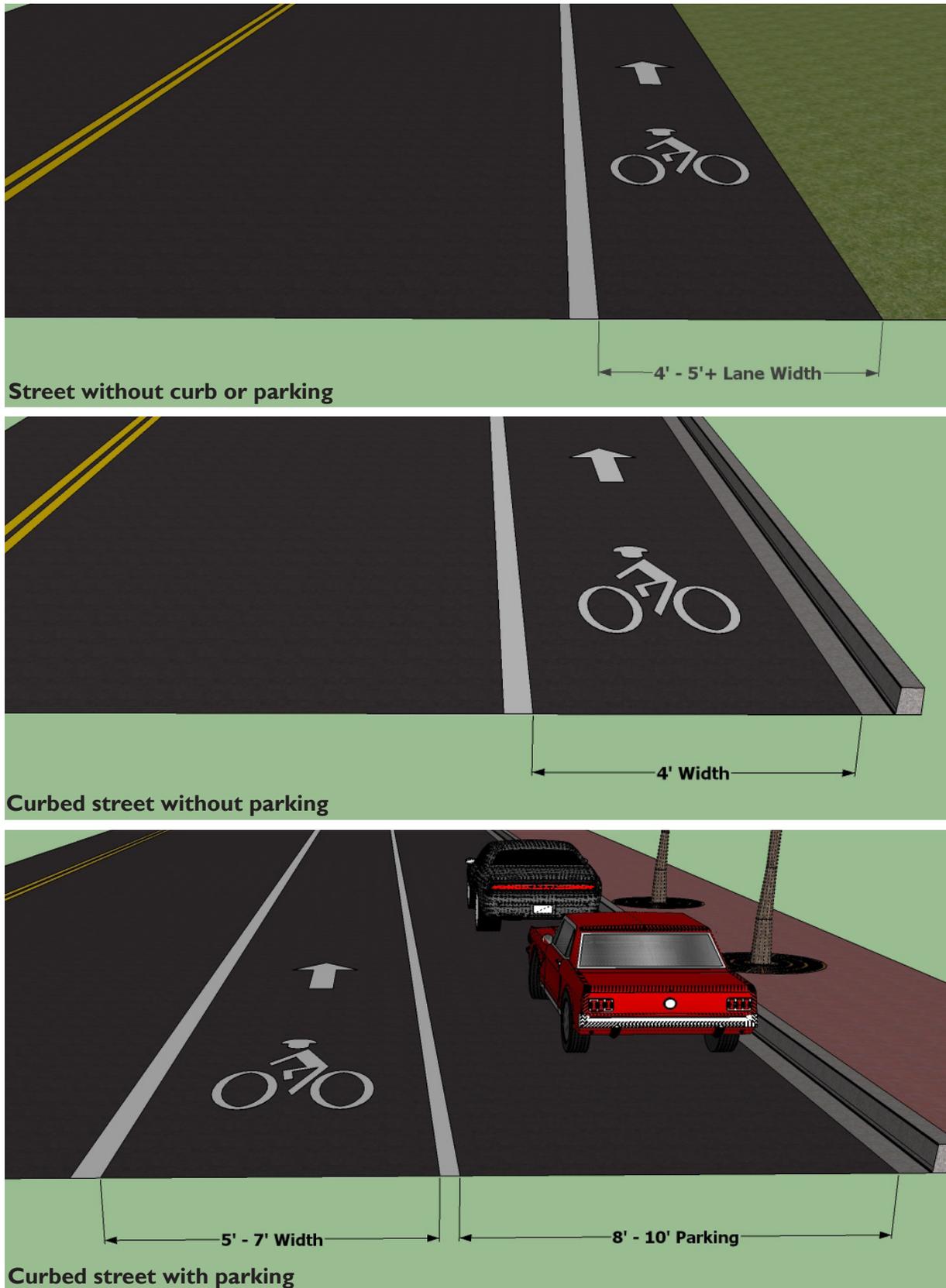
Contraflow bicycle lanes are permitted on the left side of one-way streets in New Jersey. These lanes should be marked with a solid, double yellow line and be designed one foot wider than the contextual recommendations pictured in Figure 8.

**Figure 7: Buffered Bike Lane**



Source: Philly Bike Coalition

Figure 8: Typical Bicycle Lane Treatments in New Jersey



### Bicycle Routes

Bicycle Routes are roadways designated for shared bicycle use through the installation of some combination of directional and informational signage, and pavement markings. Routes are typically located on low volume, low speed roadways. Common design treatments for bicycle routes in New Jersey are wayfinding and “Share the Road” signage and pavement markings.

#### Design –

Wayfinding signage, as pictured in Figure 9, directs cyclists to safer roads for bicycle travel, popular destinations or bicycle parking facilities. The Bike Route sign (D11-1) or a more specific variant that includes route numbers or destination headings should be used in conjunction with supplemental plaques that indicate direction, distance and route beginning/end. Bicycle guide signs and plaques may be found in Figure 9B-4 of the MUTCD. Directional signage should be included at major intersections as well as appropriate intervals along the route.

Signage directing motorists and cyclists to ‘share the road’ may also be used on roads where bicycle travel is expected or where there is a desire to make motorists aware of the likely presence of bicyclists. “Sharrows,” pictured in Figure 10, have been used effectively in New Jersey and may be combined with “share the road” sign W16-1P. Shared road treatments are most useful on low speed roadways (<35 MPH) where construction of a bike lane is unfeasible or unnecessary, but there is significant bicycle volume or safety concerns. In New Jersey, shared road treatments have been especially successful on wide streets with no shoulder and narrow urban streets with on-street parking.

Refer to Part 9 of the MUTCD for signage and pavement marking options.

**Figure 9: Bike Route Signage**



**Figure 10. Sharrow - Haven Ave, Ocean City, NJ**



## 5.2 Funding Sources

Funding for the planning and construction of bicycle facilities is available through a variety of federal, state, regional and local programs. Many of the federal, state and regional programs are competitive programs and have application and reporting procedures that will require a significant staff commitment from aid applicants. In addition, the programs listed below are very competitive and receive far more funding requests than can be obligated. Funding levels and availability are subject to change, so please contact program representatives to ensure the ongoing status of the program. Cross County Connection is available to provide assistance in determining appropriate funding sources and assisting in grant applications.

The funding programs listed below are provided as a general guide, and are not an exhaustive list of available funding sources. For more information on a specific program, please contact the granting agency or refer to grant program guidelines.

### 5.2.1 State Funding

State funding for bicycle projects is provided primarily by the NJDOT's Local Aid Program, funded by New Jersey's Transportation Trust Fund (TTF). In FY2012, the NJDOT Capital Program appropriated \$190 million for the Department's Local Aid Program, which includes funds for each program listed below except the Green Acres Program that receives funding through ballot initiatives.

#### Bikeway Grant Program

Towards the State's goal of 1,000 new miles of dedicated bikeways, grant funds are made available through NJDOT for the design and construction of new dedicated bike facilities. Program selection priority is given to the construction of new bicycle paths and bicycle facilities physically separated from motorized vehicle traffic, although the proposed construction or delineation of any bicycle facility is eligible for funding.

Program website:

<http://www.state.nj.us/transportation/business/localaid/bikewaysf.shtm>

Program contact:

District Manager, NJDOT

Phone: (856) 486-6618

Fax (856) 486-6771

Mailing address: 1 Executive Campus

Route 70 West, 3<sup>rd</sup> Floor

Cherry Hill NJ 08002

#### Centers of Place

Funding assistance through the Centers of Place program is provided to eligible municipalities under the New Jersey State Development and Redevelopment Plan for the design and construction of non-traditional transportation improvements. This program is administered through NJDOT's Division of Local Aid and Economic Development. These funds may be used for a variety of bicycle and pedestrian facility improvements. Recent grant awards included funding for streetscape, safety and wayfinding improvements.

Program website:

<http://www.state.nj.us/transportation/business/localaid/centerplace.shtm>

Program contact:

District Manager, NJDOT

Phone: 856-486-6618

Fax: 856-486-6771

Mailing address: I Executive Campus

Route 70 West, 3<sup>rd</sup> Floor

Cherry Hill, NJ 08002

### Green Acres Program

The Green Acres Program is administered by NJDEP and provides grants and loans for the acquisition and development of land for preservation and recreation. Funds from this program can be used to acquire and develop open space towards the creation of recreational trails.

Program website:

<http://www.nj.gov/dep/greenacres/>

Program contact:

Curt Gellerman, Southern Team Leader, NJDEP

Email: [Curt.Gellerman@dep.state.nj.us](mailto:Curt.Gellerman@dep.state.nj.us)

Phone: 609-984-0555

Fax: 609-984-0608

Mailing address: State of New Jersey

Department of Environmental Protection

Green Acres Program

Mail Code 501-01

P.O. Box 420

Trenton, NJ 08625-0420

### Local Aid Infrastructure Fund

The Local Aid Infrastructure Fund is administered by NJDOT to address emergency and regional needs throughout New Jersey. Any municipality or county may apply for discretionary state funds for bikeway and bicycle safety projects. Projects are selected at the discretion of the NJDOT Commissioner, and applications for funding may be submitted at any time.

Program website:

<http://www.state.nj.us/transportation/business/localaid/descrfunding.shtm>

Program contact:

District Manager, NJDOT

Phone: 856-486-6618

Fax: 856-486-6771

Mailing address: I Executive Campus

Route 70 West, 3<sup>rd</sup> Floor  
Cherry Hill, NJ 08002

Local Bicycle and Pedestrian Planning Assistance Program

This competitive technical assistance program is funded by NJDOT to create livable communities that have safe access for biking and walking. Many requests are accommodated each year but funding is limited. Examples of projects include: comprehensive bicycle and/or pedestrian plans or circulation elements; inventories and audits of sidewalks or bicycle-compatible roadways; and location- or corridor-specific bicycle and pedestrian circulation studies.

Program website:

<http://www.state.nj.us/transportation/>

Program contact:

Sheree Davis, Acting Manager, Bureau of Commuter & Mobility Strategies, NJDOT

Email: [sheree.davis@dot.state.nj.us](mailto:sheree.davis@dot.state.nj.us)

Phone: 609-530-6551

Fax: 609-530-3723

Mailing address: New Jersey Department of Transportation

P.O. Box 600

1035 Parkway Avenue

Trenton, New Jersey 08625-0600

Municipal & County Aid Program

Municipal and County Aid funds are distributed by NJDOT for roadway and bridge improvements, including bicycle and pedestrian projects. Funding amounts are made by formula for counties and competitively for municipalities. Over \$76 million in Municipal and \$78 million in County Aid projects were funded for FY12. Projects awarded funds in 2012 included construction of bicycle lanes and pedestrian safety improvements.

Program website:

<http://www.state.nj.us/transportation/business/localaid/municipalaid.shtm>

<http://www.state.nj.us/transportation/business/localaid/countyaid.shtm>

Program contact:

District Manager, NJDOT

Phone: 856-486-6618

Fax: 856-486-6771

Mailing address: 1 Executive Campus

Route 70 West, 3<sup>rd</sup> Floor

Cherry Hill, NJ 08002

Transit Village Grant Program

New Jersey's Transit Village Initiative is a joint project by NJDOT and NJ TRANSIT to incentivize transit-oriented development and revitalization of areas around New Jersey transit stations.

Municipalities with the Transit Village designation may apply for funds to be used for the construction and design of bicycle and pedestrian projects within the Transit Village area (½ mile of the transit station). Municipalities may also apply for Transit Village status to become eligible. Projects funded in 2011 included the extension of an existing bikeway, streetscape improvements and pedestrian safety improvements.

Program website:

<http://www.state.nj.us/transportation/business/localaid/transitvillagef.shtm>

Program contact:

District Manager, NJDOT

Phone: 856-486-6618

Fax: 856-486-6771

Mailing address: 1 Executive Campus

Route 70 West, 3<sup>rd</sup> Floor

Cherry Hill, NJ 08002

### 5.2.2 Federal Funding

Federal funding for bicycle and other surface transportation projects is provided primarily by the Moving Ahead for Progress in the 21st Century Act (MAP-21). MAP-21 was passed in July 2012 and runs through 2014, succeeding the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) that expired in June 2012. Due to the recent authorization of MAP-21, some of the information below may change

#### Congestion Mitigation and Air Quality Improvement Program (CMAQ)

The CMAQ program funds projects that improve air quality towards attainment of area ambient air quality standards, including congestion reduction efforts. The program is jointly administered by the Federal Highway Administration (FHWA) and the Federal Transit Administration (FTA) through the South Jersey Transportation Planning Organization (SJTPO). Bicycle paths and facilities as well as education and outreach are eligible to apply for funding.

Program website:

<http://www.sjtpo.org/Documents/AirQuality/FY%202013%20CMAQ.pdf>

Program contact:

David Heller, P.P., AICP, Senior Transportation Planner, SJTPO

Email: [dheller@sjtpo.org](mailto:dheller@sjtpo.org)

Phone: 856-794-1941

Fax: 856-794-2549

Mailing address: 782 South Brewster Road, Unit B-6

Vineland, New Jersey 08361

#### National Recreational Trails Program

The FHWA Recreational Trails Program, a part of MAP-21's Transportation Alternatives Program (TA), is administered by NJDEP through their Green Acres Program. The funds are intended for developing and maintaining trails, including bicycle paths. Project costs may be funded on up to an 80% federal share

with a 20% local match.

Program website:

[http://www.state.nj.us/dep/parksandforests/natural/trail\\_grants.htm](http://www.state.nj.us/dep/parksandforests/natural/trail_grants.htm)

Program contact:

John Flynn, Green Acres Program, NJDEP

Email: [john.flynn@dep.state.nj.us](mailto:john.flynn@dep.state.nj.us)

Phone: 609-984-0628

Fax: 609-984-0608

Mailing address: State of New Jersey

Department of Environmental Protection

Green Acres Program

Mail Code 501-01

P.O. Box 420

Trenton, NJ 08625-0420

#### Safe Routes to School Infrastructure Program

The Safe Routes to School Program, currently under MAP-21's TA program, awards federal funds to local and regional government, schools, and community non-profit organizations for projects improving safety for children walking or biking to school. Infrastructure projects may include the planning, design, construction or installation of sidewalks, crosswalks, signals, traffic-calming and bicycle facilities within two miles of an elementary or middle school (K-8).

Program website:

<http://www.state.nj.us/transportation/business/localaid/srts.shtm>

Program contact:

District Manager

Phone: 856-486-6618

Fax: 856-486-6771

Mailing address: I Executive Campus

Route 70 West, 3<sup>rd</sup> Floor

Cherry Hill, NJ 08002

#### Safe Routes to School Non-infrastructure Program

In partnership with NJDOT, New Jersey's Transportation Management Associations (TMA) administer safety and encouragement programs to encourage more walking and biking to schools. As Salem County's designated TMA, Cross County Connection administers this program among Salem County schools and municipalities. Programming includes the preparation of school travel plans, walking school buses, bicycle safety training and many other programs that may be flexibly adapted according to community interest and capacity.

Program website:

[http://www.driveless.com/programsandservices\\_education.htm](http://www.driveless.com/programsandservices_education.htm)

## Program contact:

David Calderetti, Safe Routes to School Regional Coordinator, Cross County Connection TMA

Phone: 856-596-8228

Fax: 856-983-0388

## Mailing address:

4A Eves Drive, Suite 114

Marlton, NJ 08053

Transportation Alternatives Program (TA)

The Transportation Alternatives Program is administered by both NJDOT and SJTPO for Salem County. The program is designed to foster more livable communities and promote alternative modes of transportation such as biking and walking. The program encompasses activities previously funded separately by Transportation Enhancements (TE), Safe Routes to School, Recreational Trails and Scenic Byways programs. Eligible activities include bikeway construction, acquisition of right-of-way for bikeways and many other projects.

## Program website:

<http://www.state.nj.us/transportation/business/localaid/enhancements.shtm>

## Program contact:

District Manager, NJDOT

Phone: 856-486-6618

Fax: 856-486-6771

Mailing address: 1 Executive Campus

Route 70 West, 3<sup>rd</sup> Floor

Cherry Hill, NJ 08002

### 5.3 Technical Support

Many organizations provide support for the planning and implementation of bicycle infrastructure and bicycle-supportive programs. Below is a list of some of the many regional, state and national organizations that may be useful in such activities.

Cross County Connection TMA  
<http://www.driveless.com>

National Complete Streets Coalition  
<http://www.completestreets.org>

New Jersey Bicycle and Pedestrian Resource Center  
<http://njbikeped.org/>

NJ Bike & Walk Coalition  
<http://www.njbike.org>

NJDOT Bicycle Resources  
<http://www.state.nj.us/transportation/commuter/bike/resources.shtm>

Rails to Trails  
<http://www.railstotrails.org>

South Jersey Transportation Planning Organization (SJTPO)  
<http://www.sjtpo.org/index.html>

# Appendix A: Salem County Survey Instrument



**CROSS COUNTY CONNECTION**  
TRANSPORTATION MANAGEMENT ASSOCIATION

4A Eves Drive  
Suite 114  
Marlton, NJ 08053  
Voice: (856) 596-8228  
Fax: (856) 983-0388  
www.driveless.com

## Salem County Bicycle Facilities Survey

Municipality	<input type="text"/>	Date	<input type="text"/>
Name	<input type="text"/>	Telephone	<input type="text"/>
Title	<input type="text"/>	Email	<input type="text"/>

### Instructions

This survey is intended to update the *Salem County Bicycle Facilities Inventory* published in June 2007 by Cross County Connection. Along with written location descriptions, please use the attached map to indicate where bicycle facilities are located. If more space is needed than is provided below, feel free to attach additional sheets. Feel free to submit written responses and hand-drawn maps. This form may be emailed directly by using the "Submit by Email" button at the end of the form. Please mail, fax or email this survey along with any supplementary maps and materials to the following:

Graydon Newman, Transportation Specialist Cross County Connection TMA 4A Eves Dr., Ste. 114 Marlton, NJ 08053	Email: <a href="mailto:newman@driveless.com">newman@driveless.com</a> Fax: 856-983-0388
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1. Please detail below all on-road and off-road bicycle routes and paths not shown on the attached bicycle facilities map and how they are delineated (striped, signed, etc.).

2. Please identify additional roadways that are "shared roadways," compatible with bicycle traffic. These contain a combination of bicycle signage and compatible roadway layouts (e.g. shoulder width >4ft., low traffic volume, low traffic speed, etc.).

3. Please identify any proposed bicycle routes and paths not listed in the attached bicycle facilities map.

4. If there has been any bicycle signage placed, please list type and general location below.

5. Are you aware of any bicycle safety programs in your municipality? These can programs by the local government, schools, or any other organization.

6. Does your municipality have a Bicycle and Pedestrian Plan, either stand-alone or as a Master Plan element? If yes, please attach.

7. Have any recent municipal roadway rehabilitation or resurfacing projects included shoulder widening? If so, please list them below.

8. Please list any traffic calming measures (curb bump-outs, speed humps, signage, etc.) that have been implemented since 2007, including location and approximate date.

9. Please outline any bicycle- or pedestrian-friendly ordinances or policies adopted by your municipality.

Additional Comments:

If you have any questions about this form or how to fill it out, please contact Graydon Newman, Transportation Specialist, at **856-596-8228** or [newman@driveless.com](mailto:newman@driveless.com). Please mail, fax or email using the button below, this survey along with any supplementary maps and materials to the following:

Graydon Newman, Transportation Specialist  
Cross County Connection TMA  
4A Eves Dr., Ste. 114  
Marlton, NJ 08053

Email: [newman@driveless.com](mailto:newman@driveless.com)  
Fax: 856-983-0388

Submit by Email

Print Form

**Thank You**

## Appendix B: Bikeway Demand Analysis Methods

The intent of the bikeway demand analysis is to estimate locations of latent demand for bicycle facilities in Salem County. Latent demand was estimated based on a number of factors corresponding to favorable conditions for increased bicycle travel rates including demographic measures, trip attractors and characteristics of the transportation network that are favorable to cycling, shown in Table A1. Demand factors were analyzed spatially using a weighted GIS raster sum analysis.

**Table B1: Bikeway Demand Analysis Factors**

Importance	Bicycle Demand Factors	Weight				Geography	Data Source
		1/2 mi	1 mi	1 1/2 mi	2 mi		
High	Population density - persons per square mile	20	15	10	5	Census Block	US Census 2010
High	Households without auto per sq. mi.	20	15	10	5	Census Tract	ACS 2005-09
High	Employment location density - locations employing ≥20 people per square mile	20	15	10	5	Census Block	Geocoded NJDOL data
High	Road network connectivity - number of intersections per square mile	20	15	10	5	Census Block	US Census TIGER
High	Road network density - roadway mileage per square mile	20	15	10	5	Census Block	US Census TIGER
		1/2 mi	1 mi	1 1/2 mi	2 mi		
High	Colleges/Universities	20	15	10	5	Point	NJOIT
Medium	Schools	10	5	2	1	Point	NJOIT
Medium	NJ TRANSIT Bus Stops	10	5	2	1	Point	NJ TRANSIT
Medium	Libraries	10	5	2	1	Point	CCCTMA
Medium	Park Entrances	10	5	2	1	Point	CCCTMA
Medium	Existing Bikeways	10	5	2	1	Point	CCCTMA
Low	Museums/Historic points of interest	4	2	1	1	Point	CCCTMA
Low	Hospitals	4	2	1	1	Point	NJOIT
Low	Places of Worship	4	2	1	1	Point	CCCTMA

The analysis included the following tasks:

1. Fourteen data layers containing demand variables were created or compiled. Density demand factors were calculated to the smallest census-designated area available.
2. Point-source trip attractor locations were buffered at 1/2-mile increments up to a two-mile radius, and each concentric area was assigned a weighted value between 1 and 20 depending on its proximity to the location and estimated importance to bicycle travel and demand. Density-based demand factors were grouped into four categories based on natural breaks in the dataset and assigned weights

between 5 and 20.

3. The county was rasterized into a grid of 10 meter square cells to permit a fine-grained picture of latent demand in the county.
4. Demand factor layers were rasterized, assigning appropriate weighted values to each 10 meter raster cell in the county.
5. Values in each raster cell were summed to reach an aggregate cell “demand score” indicating the latent demand for biking.
6. Proposed bikeways were segmented based on their location adjacent to areas with high (>75) and low (<75) raw aggregate demand scores, shown in Map B1. The threshold between high and low demand areas was based on an observed correlation between aggregate cell demand scores and observed development, population, number of nearby attractors and road network density. Two-mile straight line buffers were created around these facility segments and “bikeway demand scores” were determined by normalizing the aggregate cell demand score by the total area of the buffer. Standardized bikeway demand scores were calculated as z-scores to more directly compare latent demand among proposed bikeways.

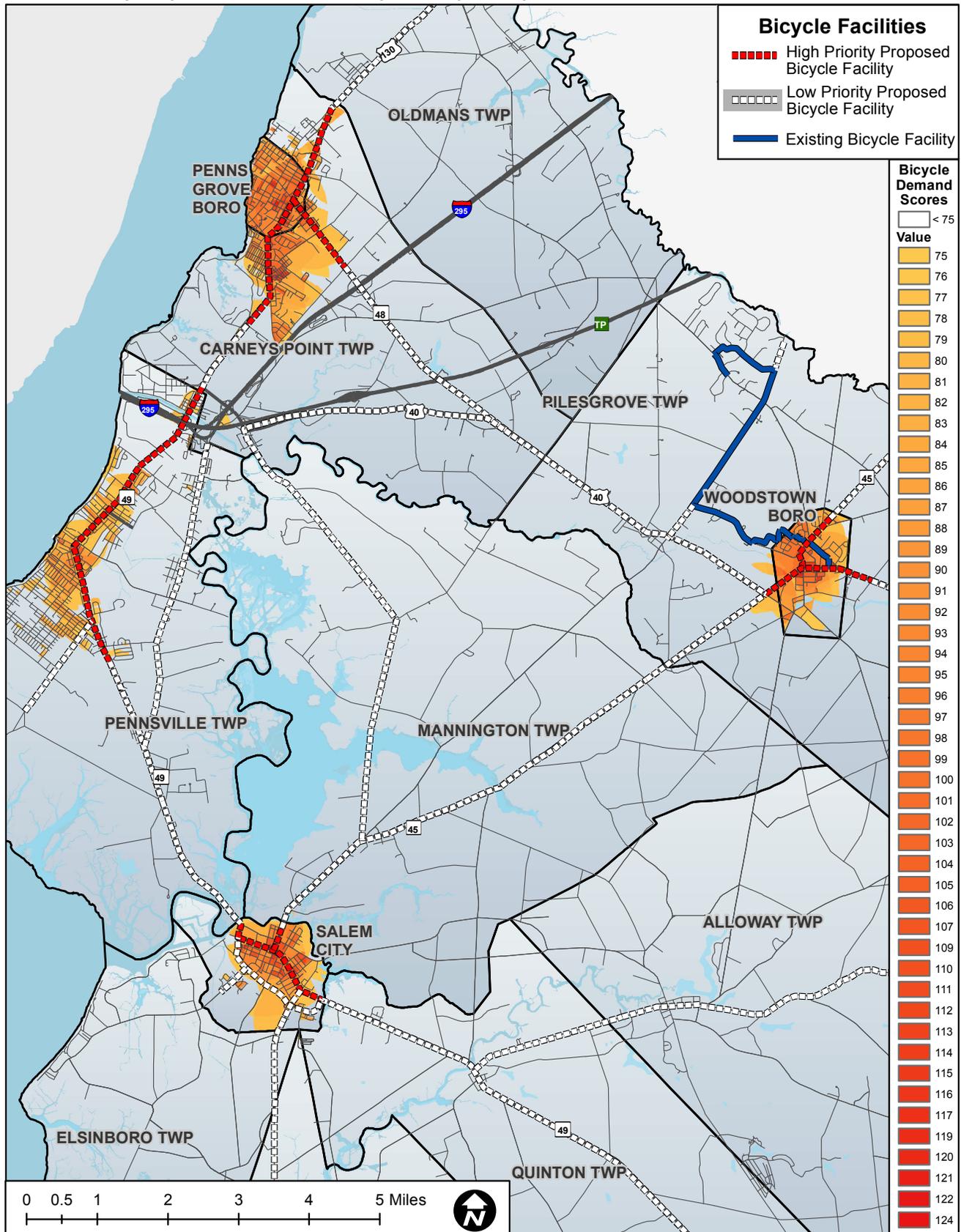
Demand factors valued three major attributes:

- Number of potential cyclists and residents with limited transportation options located near the proposed bikeway.
- Presence of destinations that would attract bicycle travel including employment destinations, schools, parks, transit stops, libraries and existing bikeways, among other factors.
- Presence of a road network that offers route choices to cyclists and potential cyclists.

Each bikeway was reexamined after standardized bikeway scores were generated to minimize instances of inflated demand scores where straight-line buffers of some facilities captured demand factors not accessible to the bikeway. Proposed bikeways such as Salem County 625 from Grieves Parkway to Delaware Drive, South Front Street and Fort Mott Road were reduced in priority based on examination of adjacent land uses and attractors through field visits and map analysis.

# Map B1: Salem County High Demand Areas

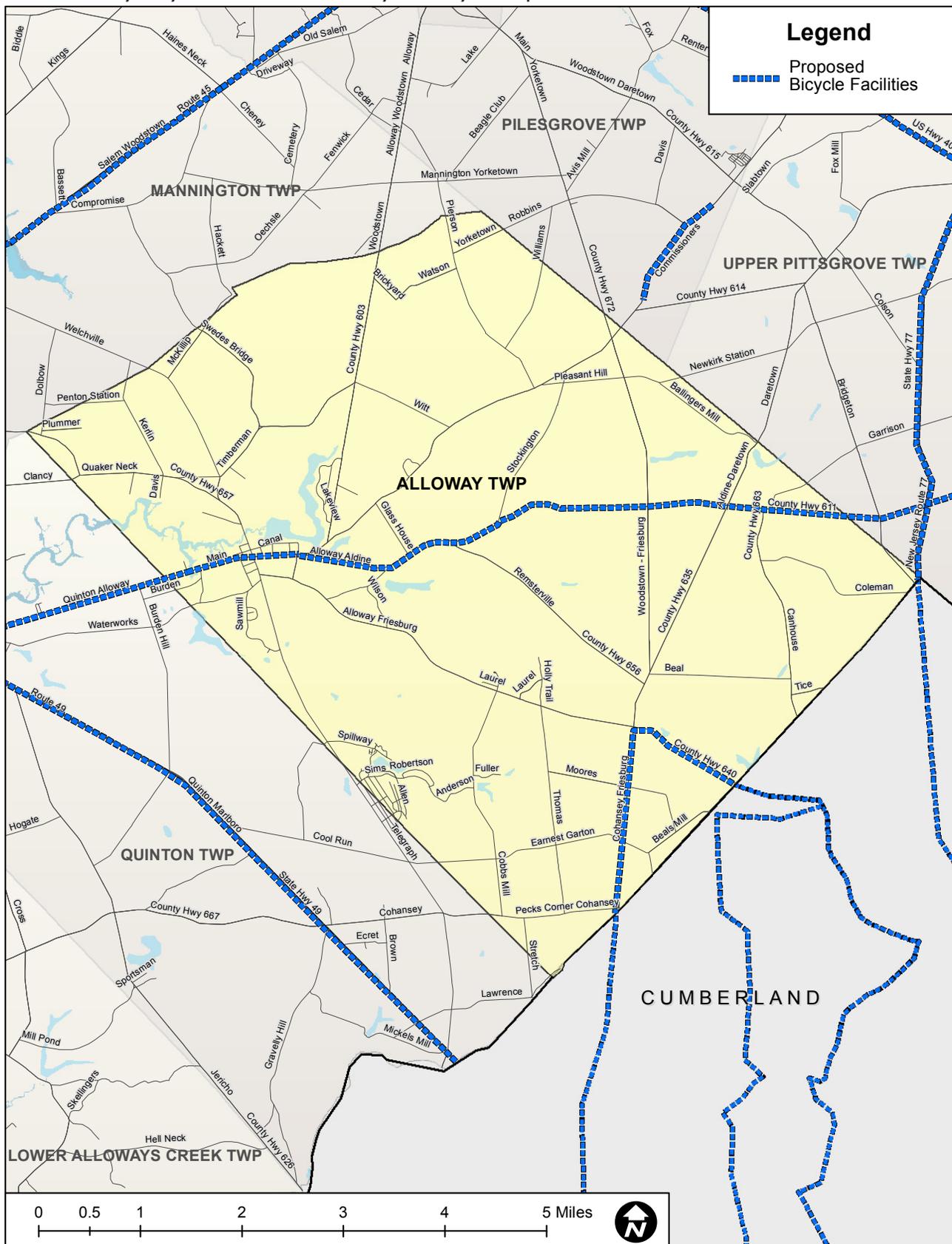
Salem County Bicycle Facilities Inventory & Analysis, September 2012



## **Appendix C: Maps of Existing and Proposed Bikeways by Municipality**

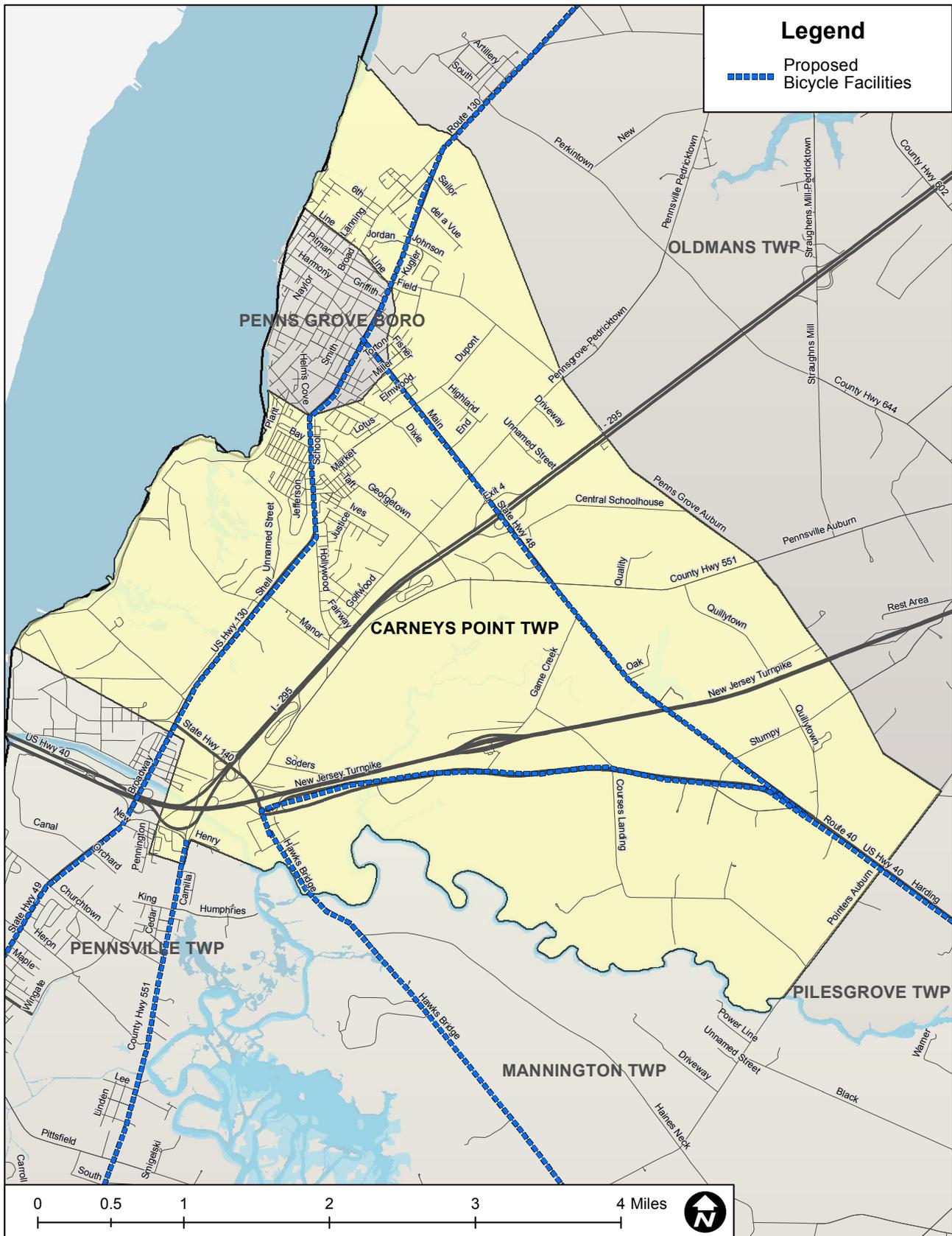
# Map C1: Existing and Proposed Bikeways, Alloway Township

Salem County Bicycle Facilities Inventory & Analysis, September 2012



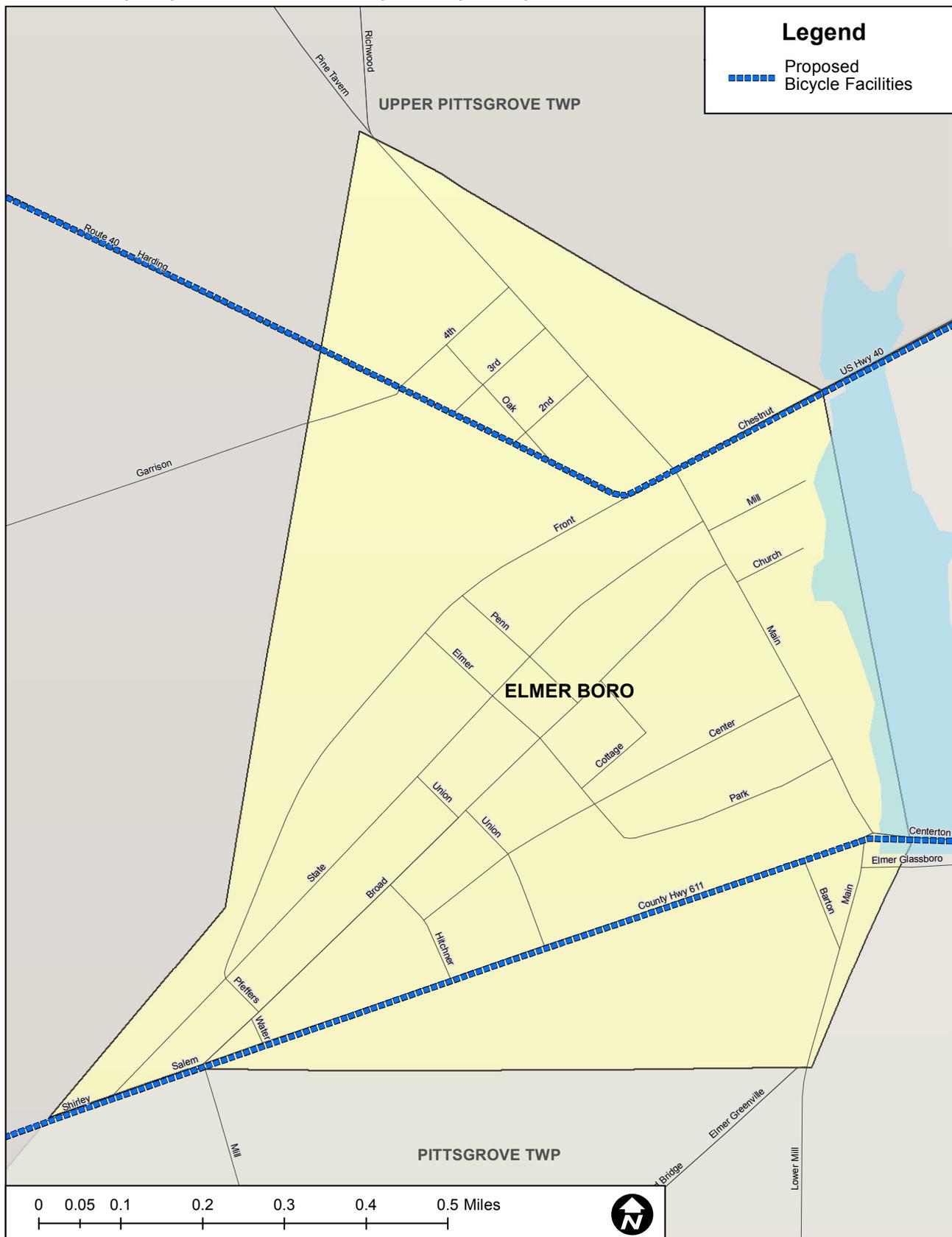
# Map C2: Existing and Proposed Bikeways, Carneys Point Township

Salem County Bicycle Facilities Inventory & Analysis, September 2012



# Map C3: Existing and Proposed Bikeways, Elmer Borough

Salem County Bicycle Facilities Inventory & Analysis, September 2012



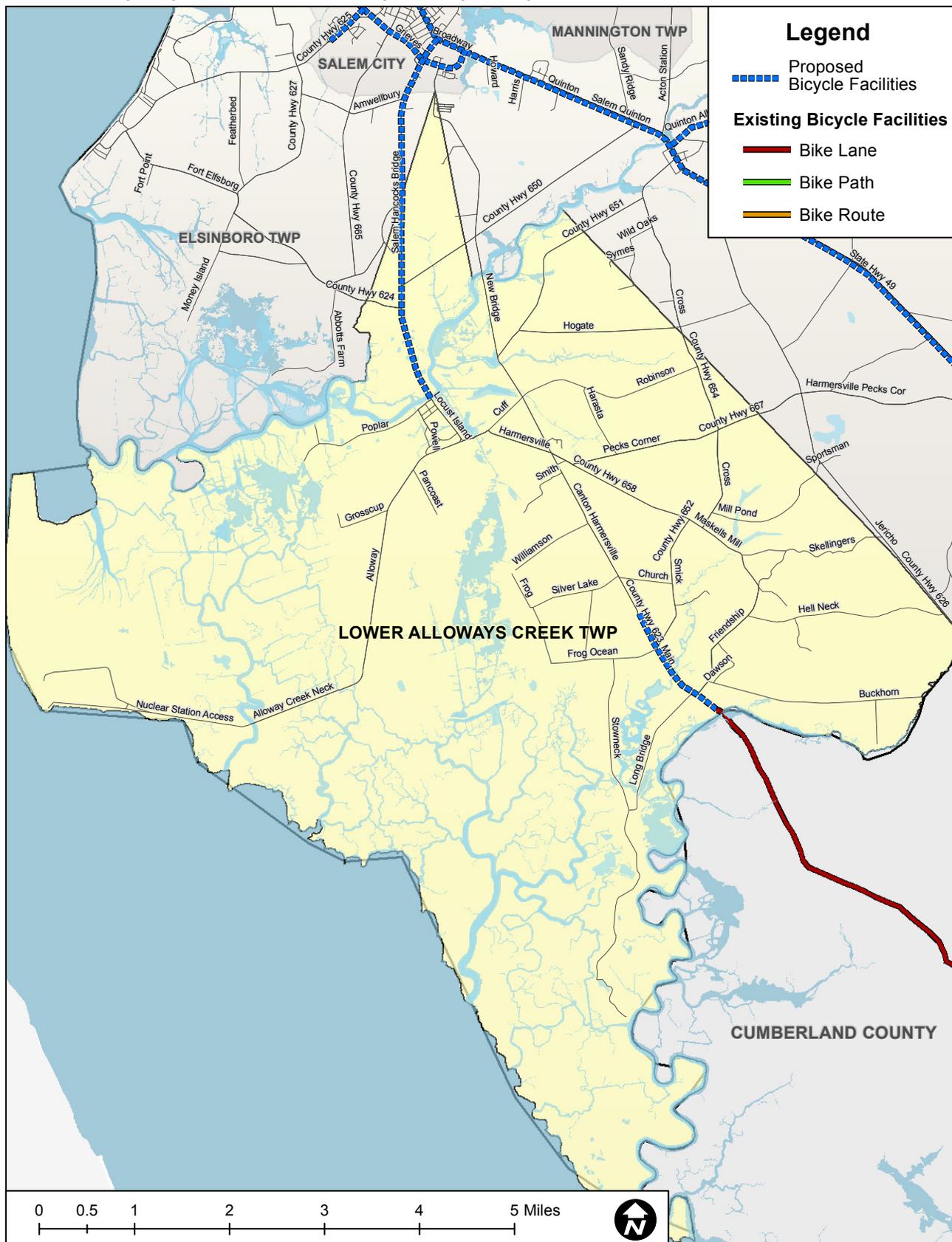
# Map C4: Existing and Proposed Bikeways, Elsinboro Township

Salem County Bicycle Facilities Inventory & Analysis, September 2012



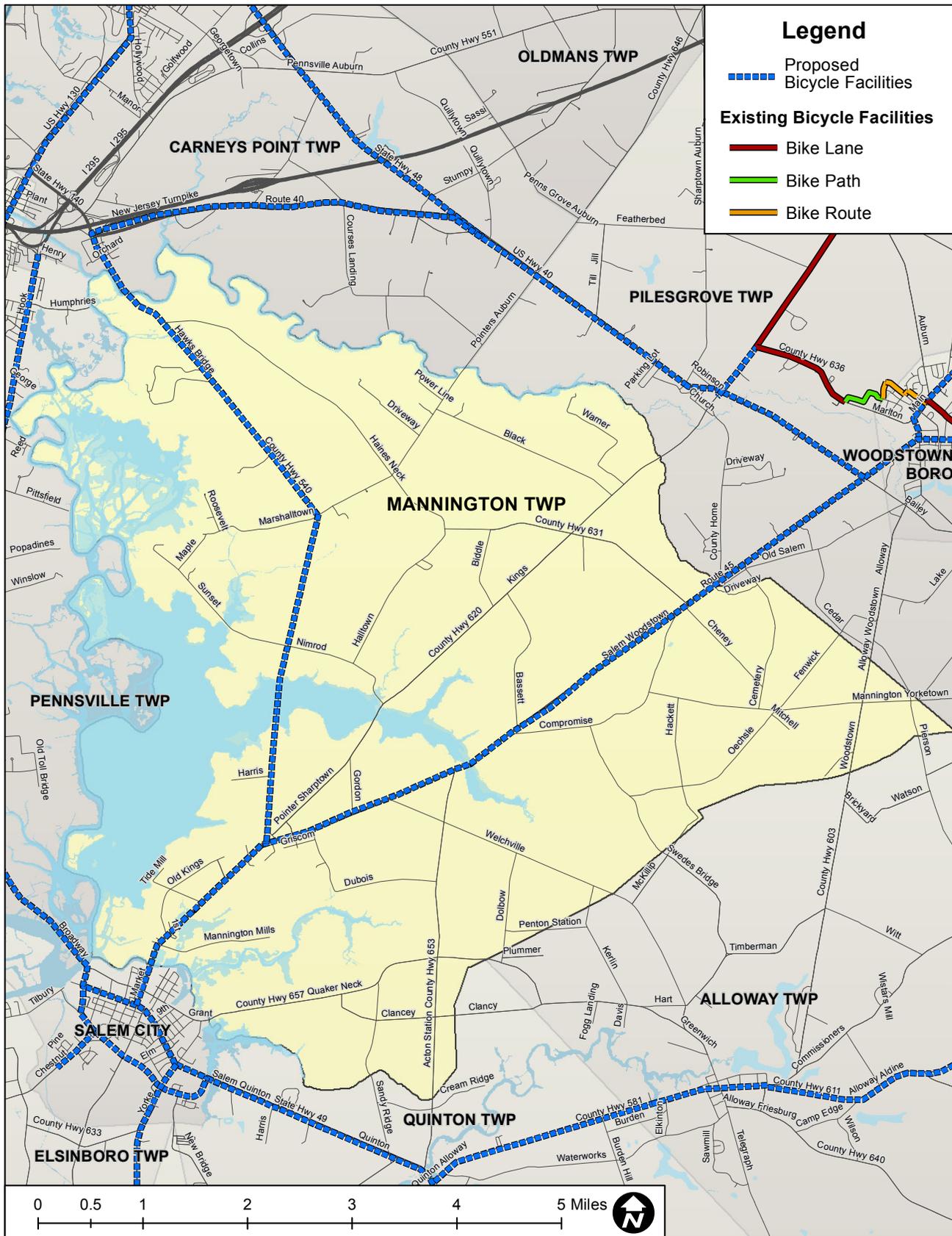
# Map C5: Existing and Proposed Bikeways, Lower Alloways Creek Township

Salem County Bicycle Facilities Inventory & Analysis, September 2012



# Map C6: Existing and Proposed Bikeways, Mannington Township

Salem County Bicycle Facilities Inventory & Analysis, September 2012





# Map C8: Existing and Proposed Bikeways, Penns Grove Borough

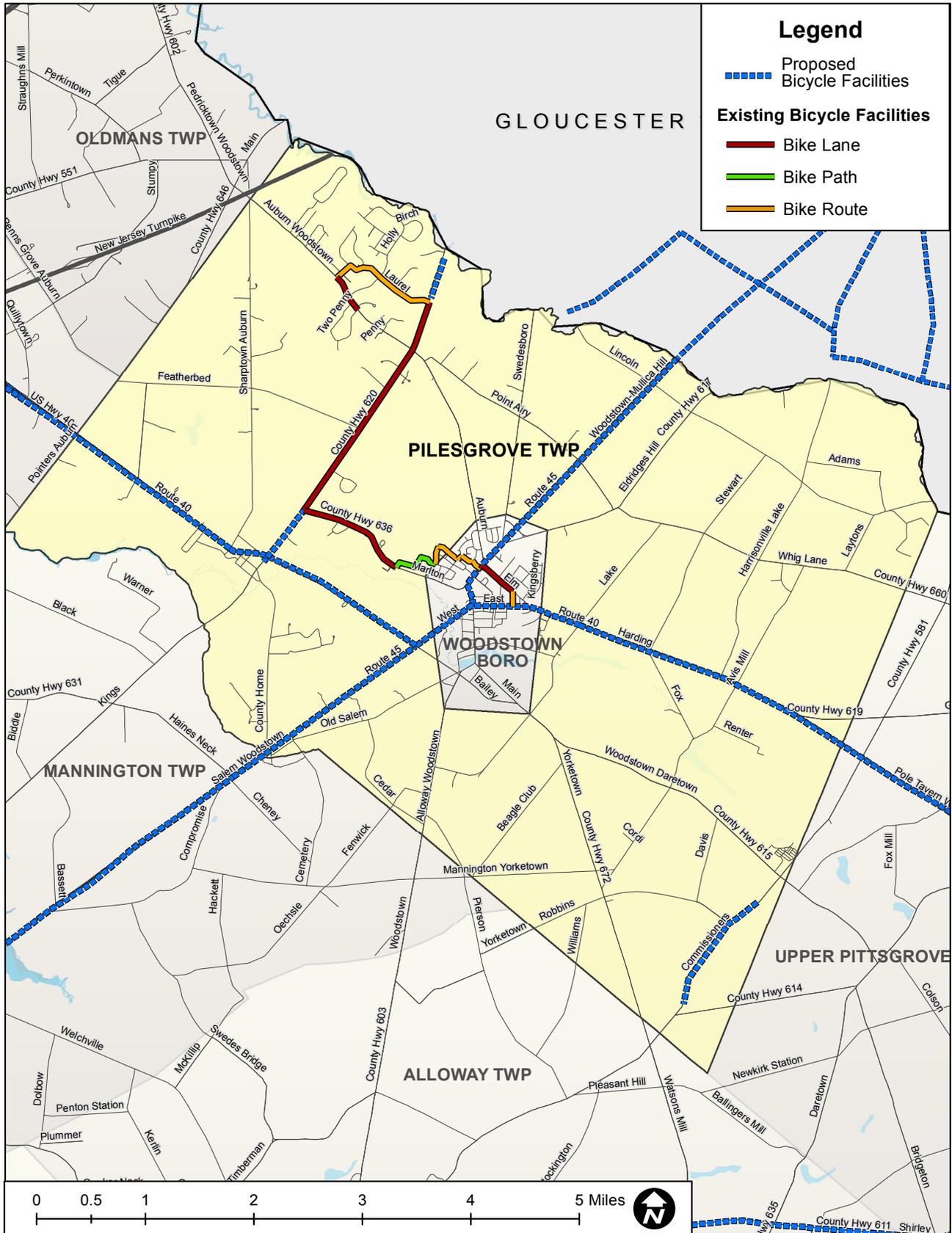
Salem County Bicycle Facilities Inventory & Analysis, September 2012





# Map C10: Existing and Proposed Bikeways, Pilesgrove Township

Salem County Bicycle Facilities Inventory & Analysis, September 2012

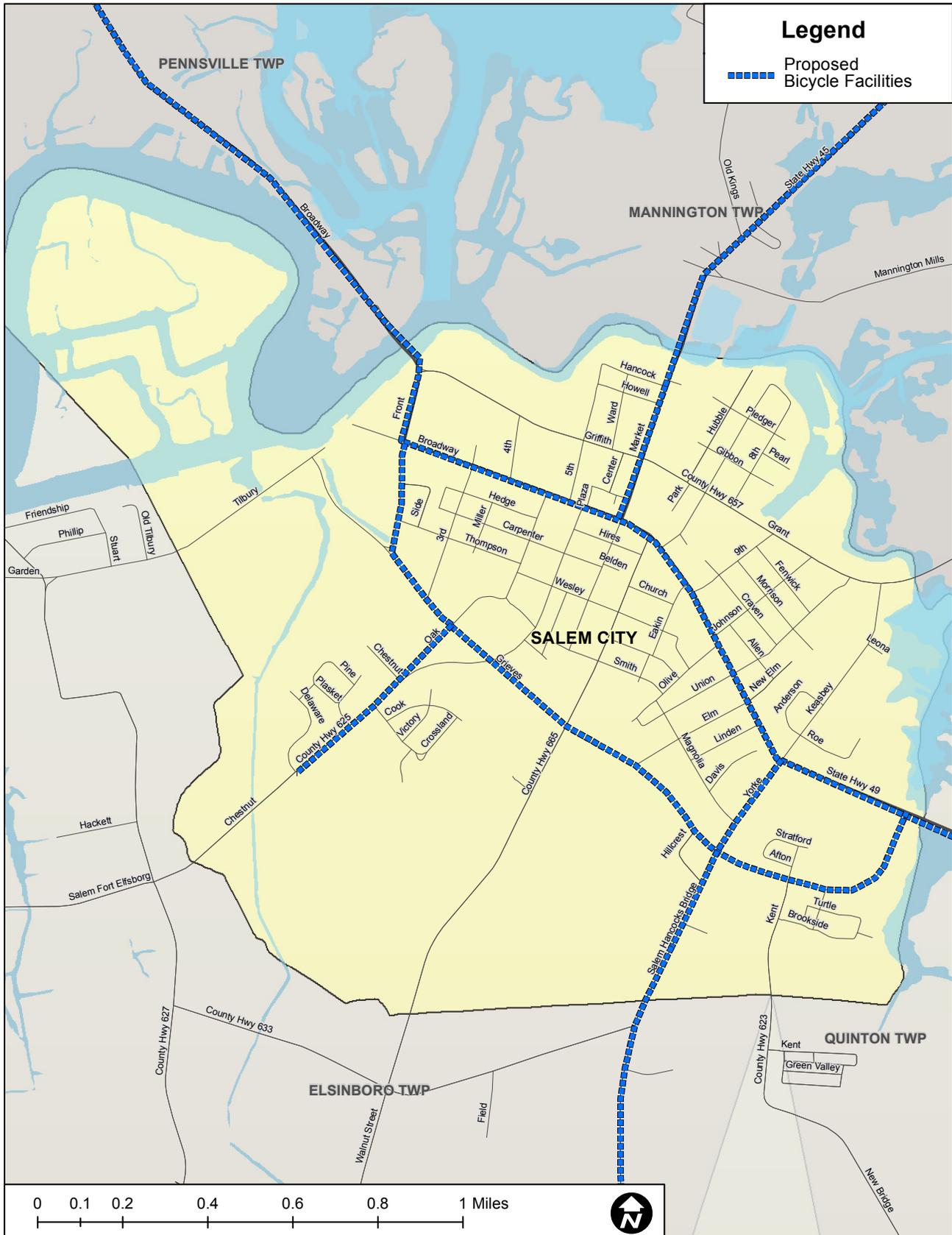






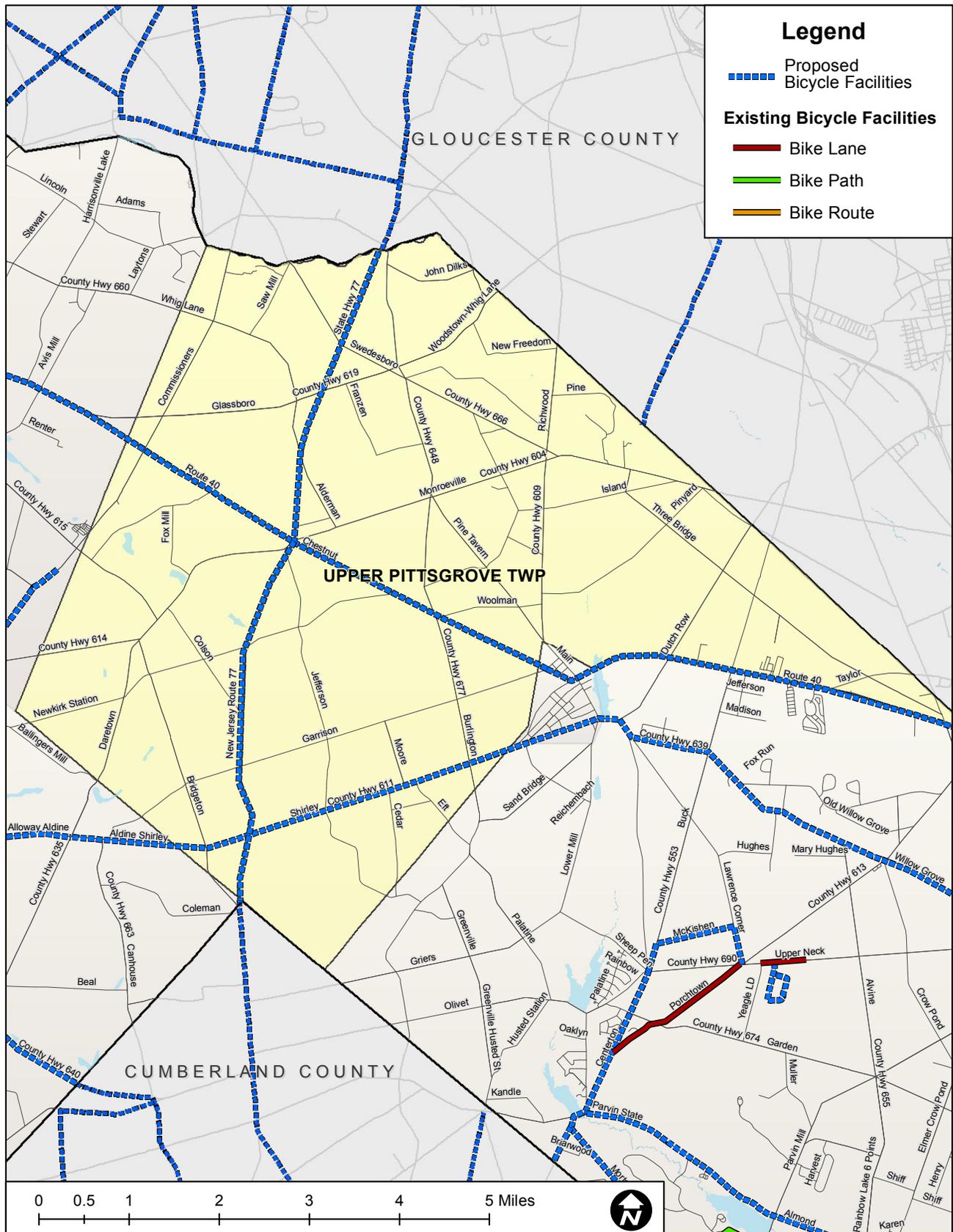
# Map C13: Existing and Proposed Bikeways, Salem City

Salem County Bicycle Facilities Inventory & Analysis, September 2012



# Map C14: Existing and Proposed Bikeways, Upper Pittsgrove Township

Salem County Bicycle Facilities Inventory & Analysis, September 2012





# Appendix D: Salem County Existing and Proposed Bikeways

Table D1: Salem County Existing and Proposed Bikeways

Name	Status	Type	Design	Roadway Number	Jurisdiction	Municipality	Source	Length (mi.)
Azalea Rd	Existing	On-Road	Bike Route		Municipal	Pilesgrove Twp	NJ State Plan	1.1
Borton Rd	Existing	On-Road	Bike Route		Municipal	Woodstown Boro	Pilesgrove Twp	0.0
Causeway Rd	Existing	On-Road	Bike Lane	Salem County 623	County	Stow Creek Twp	NJ State Plan	0.1
Elms Street	Existing	On-Road	Bike Lane		Municipal	Woodstown Boro	Pilesgrove Twp	0.4
Grandview Drive	Existing	On-Road	Bike Route	Grandview Drive	Municipal	Pilesgrove Twp	Pilesgrove Twp	0.2
Grant Street	Existing	On-Road	Bike Route		Municipal	Pilesgrove Twp, Woodstown Boro	Pilesgrove Twp	0.2
Harris Lane	Existing	On-Road	Bike Route		Municipal	Woodstown Twp	Pilesgrove Twp	0.1
Howard Ave	Existing	On-Road	Bike Route		Municipal	Woodstown Boro	Pilesgrove Twp	0.1
Kings Highway	Existing	On-Road	Bike Lane	Salem County 620	County	Pilesgrove Twp	Pilesgrove Twp	2.3
Main Street Woodstown	Existing	On-Road	Bike Lane		Municipal	Woodstown Boro	Pilesgrove Twp	0.0
Malton Rd	Existing	On-Road	Bike Lane	Salem County 636	County	Pilesgrove Twp	Pilesgrove Twp	1.0
Porchtown Road	Existing	On-Road	Bike Lane	Salem County 613	County	Pittsgrove Twp	Pittsgrove Twp	1.7
School Lane	Existing	On-Road	Bike Route		Municipal	Woodstown Boro	Pilesgrove Twp	0.1
Upper Neck Road	Existing	On-Road	Bike Lane	Salem County 690	County	Pittsgrove Twp	Pittsgrove Twp	0.5
Alloway Aldine Rd	Proposed	On-Road		Salem County 611	County	Alloway Twp	Alloway Twp	4.4
Almond Road	Proposed	On-Road		Salem County 540	County	Pittsgrove Twp	Township of Pittsgrove	5.4
Bridgeton Pike	Proposed	On-Road		NJ 77	State	Upper Pittsgrove Twp	NJ State Plan	3.4
Centerton Rd	Proposed	On-Road		Salem County 553	County	Pittsgrove Twp	NJ State Plan	2.4
Circuit Route (Rt 640)	Proposed	On-Road		Salem County 640	County	Alloway Twp	Hopewell Twp, Cumberland Cnty	3.0
Commissioners Pike	Proposed	On-Road		Salem County 581	County	Pilesgrove Twp	NJ State Plan	1.2
Fort Mott Rd	Proposed	On-Road		Salem County 630	County	Pennsville Twp	NJ State Plan	1.6
Grieves Pkwy	Proposed	On-Road		Salem County 623	County	Salem City	Salem County	1.4
Hancock's Bridge Rd	Proposed	On-Road		Salem County 658	County	Elsinboro Twp, Lower Alloways Creek Twp, Salem City	Salem County	3.9

Name	Status	Type	Design	Roadway Number	Jurisdiction	Municipality	Source	Length (mi.)
Harding Highway	Proposed	On-Road		NJ 48	State	Carney's Point Twp	NJ State Plan	3.3
Hawks Bridge Rd	Proposed	On-Road		Salem County 540	County	Carney's Point Twp, Mannington Twp	NJ State Plan	3.3
Hook Rd	Proposed	On-Road		Salem County 551	County	Pennsville Twp	NJ State Plan	4.4
Kings Highway 1	Proposed	On-Road		Salem County 620	County	Pilesgrove Twp	NJ State Plan	0.6
Kings Highway 2	Proposed	On-Road		Salem County 620	County	Pilesgrove Twp	NJ State Plan	0.4
Main Street/Alloway	Proposed	On-Road		Salem County 581, Salem County 611	County	Alloway Twp	Alloway Twp	1.1
Mckishen Rd	Proposed	On-Road		Salem County 553	County	Pittsgrove Twp	Pittsgrove Twp	1.7
Morton Avenue	Proposed	On-Road		Salem County 634	County	Pittsgrove Twp	Pittsgrove Twp	2.5
Pointers Auburn	Proposed	On-Road		Salem County 540	County	Mannington Twp	NJ State Plan	3.2
Pole Tavern Rd	Proposed	On-Road		NJ 77	State	Upper Pittsgrove Twp	NJ State Plan	4.2
Quinton Alloway Rd	Proposed	On-Road		Salem County 581	County	Alloway Twp, Quinton Twp	Alloway Twp	2.2
Route 130	Proposed	On-Road		US 130	US	Oldsman Twp, Carney's Point Twp, Pennsville Twp, Penns Grove Boro	NJ State Plan	8.8
Route 40	Proposed	On-Road		US 40	US	Carney's Point Twp, Woodstown Boro, Pilesgrove Twp, Upper Pittsgrove Twp, Elmer Boro, Pittsgrove Twp	NJ State Plan	23.0
Route 45	Proposed	On-Road		NJ 45	State	Pilesgrove Twp, Woodstown Boro	NJ State Plan	3.0
Route 48 Harding Highway	Proposed	On-Road		NJ 48	State	Carney's Point Twp	NJ State Plan	1.2
Route 49	Proposed	On-Road		NJ 49	State	Pennsville Twp, Salem City, Quinton Twp	NJ State Plan	18.7
Route 77	Proposed	On-Road		NJ 77	State	Alloway Twp	NJ State Plan	0.0
Salem County 623	Proposed	On-Road		Salem County 623	County	Lower Alloways Creek Twp	NJ State Plan	1.3
Salem County 625	Proposed	On-Road		Salem County 625	County	Salem City	NJ State Plan	0.5

Name	Status	Type	Design	Roadway Number	Jurisdiction	Municipality	Source	Length (mi.)
Salem Woodstown Rd/ Route 45	Proposed	On-Road		NJ 45	State	Salem City, Mannington Twp, Pilesgrove Twp	NJ State Plan	8.8
Shriley Road	Proposed	On-Road		Salem County 611	County	Alloway Twp, Upper Pittsgrove Twp, Elmer Boro	NJ State Plan	6.2
South Front St	Proposed	On-Road			Municipal	Pennsville Twp, Salem City, Elsinboro Twp, Lower Alloways Creek Twp	NJDOT	0.5
Willow Grove Rd	Proposed	On-Road		Salem County 639	County	Pittsgrove Twp	NJ State Plan	5.7
Parvin State Park Trail	Existing	Off-Road	Bike Path		Off-Road	Pittsgrove Twp	NJ State Plan	0.7
Pilesgrove Twp Off Road	Existing	Off-Road	Bike Path		Off-Road	Pilesgrove Twp	Pilesgrove Twp	0.5
Green Branch Park	Proposed	Off-Road			Off-Road	Pittsgrove Twp	Township of Pittsgrove	1.0