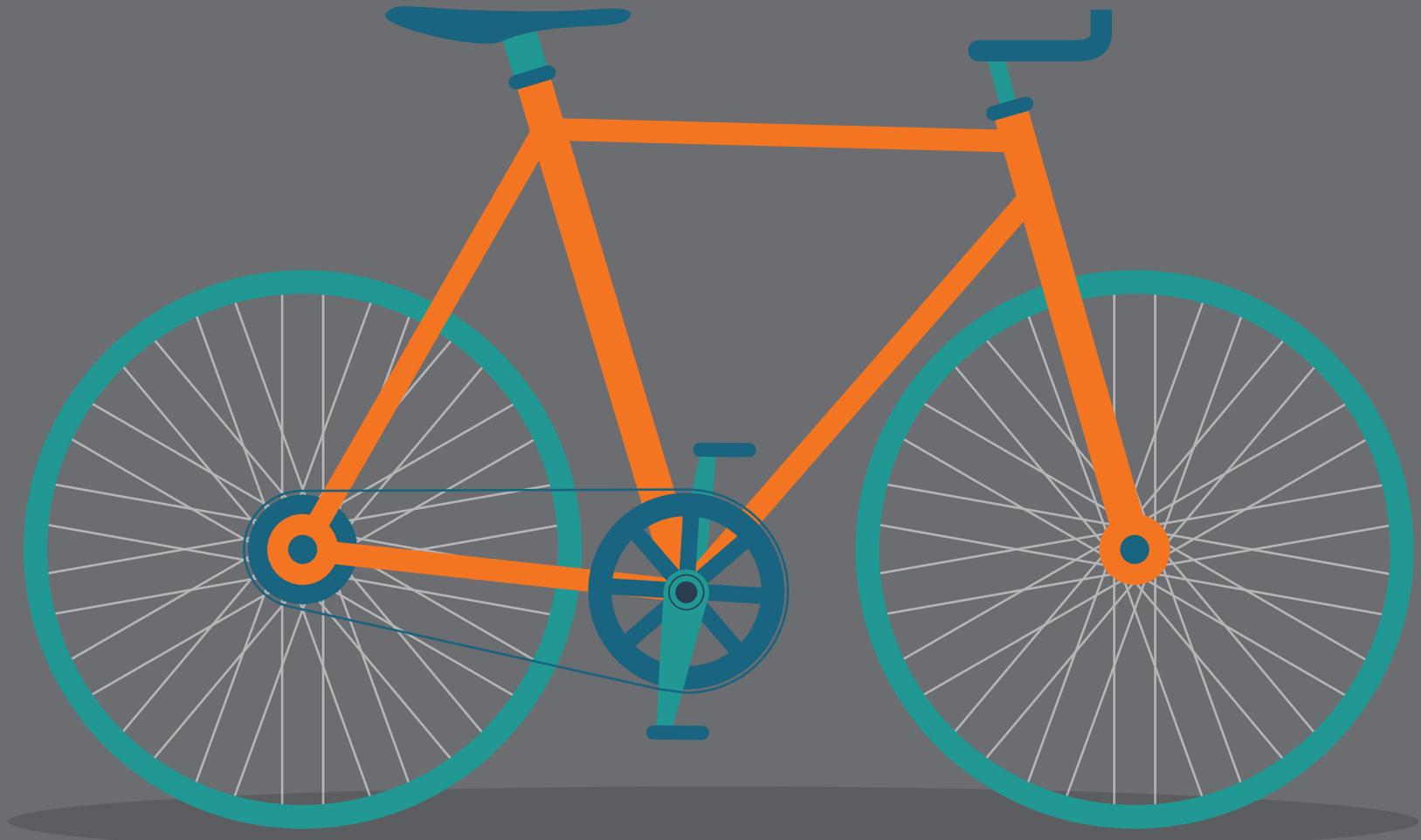


Upper Township BICYCLE PLAN



Upper Township
BICYCLE PLAN



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01 INTRODUCTION

Upper Township in Cape May County has developed a bicycle plan as part of the New Jersey Department of Transportation's (NJDOT) Local Bicycle/Pedestrian Planning Assistance Program, which seeks to foster the development of non-motorized transportation modes in accordance with statewide goals and local needs.

In 2016, Upper Township requested a review of bicycle conditions along North Shore Road (formerly US Route 9) between Roosevelt Boulevard and Harbor Road, as well as conditions along Harbor Road connecting to the soon to be completed multi-use facility along the new Great Egg Harbor Bridge. Following an initial review of this corridor, the study scope was expanded to include an analysis of on- and off-road bicycle conditions throughout the Township.

This report provides an overview of the existing conditions and recommendations for bicyclists in Upper Township. It includes an analysis of crash data; identification of key

bicycle traffic generators; review of key corridors for non-motorized traffic; and an assessment of the roadway network's bicycle Level of Traffic Stress (LTS). This report also highlights the recommendations developed by the project team to improve conditions for bicyclists in Upper Township. These recommendations are based on the analysis in the existing conditions and input from the Stakeholder Advisory Committee. The proposed improvement concepts focus on the "4 E's"- Engineering, Education, Enforcement, and Encouragement. Through this holistic approach, the education, encouragement, and enforcement recommendations focus on policy and program options to improve safety and foster bicycle travel throughout Upper Township, while the engineering recommendations identify physical infrastructure improvements at priority locations. These recommendations seek to improve mobility and safety for all travelers and travel modes.



TUCKAHOE

TUCKAHOE

1781

M-607

SEABOARD AIR LINES

02 BACKGROUND

Upper Township comprises the northern-most portion of Cape May County, including 62.15 square miles of land and 6.54 square miles of water. It ranks among the top 5 percent of New Jersey Communities in land area, but is near the bottom 10 percent in population density, making it a largely rural area. The general composition of Upper Township is shown in Map 1.

Upper Township was formed on April 12, 1723 and was incorporated as one of New Jersey's initial 104 townships on February 21, 1798.

The Township offers great vacation opportunities. There are beaches in Strathmere, Tuckahoe and Beasley's Point. Campgrounds are located throughout the Township, as well as parks, golf courses, and areas for boating and canoeing.

The Township has identified ten villages with varying land use patterns. These include a mix of low density residential development and commercial development near village centers, with much of the rest of the township classified as open space or wetlands.

Demographics and Area Summary

Per 2011-2015 American Community Survey 5-Year Estimates, the population of Upper Township is 12,157. The median age of the Township is 42.7 years and 17.4 percent of the population is 65 years and older. This is lower than Cape May County where the median age is 48.3 and 23.2 percent of the population is 65 years and older. The median household income of the municipality is \$77,012, this is higher than that of Cape May County's (\$57,637).

Per 64.2 percent (6,352) of the population is employed. Commuting to work data from the American Community Survey (ACS) indicates that 1 percent (63) of the population takes public transit, 1.1 percent bikes, and 0.4 percent walks to work.

Upper Township experiences an influx of population/ tourists during the summer months. According to Cape May County's 2012 summer population estimates the population nearly quadruples to 48,121 compared to the year-round population of 12,157. The County summer population estimates for Upper Township are shown in Table 1 below.

Table 1 - Summer Population Estimates

Category	Number	Occupancy
DU 2012	6,369	31,845 (times 5 per DU)
Hotel Units	70	175 (2.5 residents per site)
Camp Sites	2,381	8,929 (3.75 campers per site)
Marina Slips	357	714
Day Trippers	6,450	
Total Population	48,121	

Villages

The township is made up of 10 small villages: Beesley's Point, Marmora, Palermo, Seaville, Tuckahoe, Greenfield, Marshalville, Steelmantown, Petersburg and Strathmere. The village locations are shown in Map 2. Table 2 describes the land use types in each village.

As shown in Map 2, some villages are surrounded by wetlands, and they act as barriers to connectivity between villages.

The plan seeks to create a more cohesive and interconnected community by using improved bicycle linkages within and between Upper Township's ten villages while retaining and enhancing the unique and distinct character of each.

Table 2 - Upper Township Village Land Uses

Village	Land Use
Beesley's Point	Commercial, industrial, residential, beach, wetlands
Marmora	Residential, commercial, wetlands
Palermo	Residential, commercial, wetlands
Seaville	Residential, Commercial
Tuckahoe	Residential, commercial, beach, wetlands
Greenfield	Residential
Marshalville	Residential
Steelmantown	Residential, open space
Petersburg	Residential, commercial, wetlands
Strathmere	Residential, beach

Existing, Proposed and Funded Bicycle Projects in Upper Township

In Upper Township, Cape May County has proposed two off-road facilities: Along an existing NJ TRANSIT rail ROW and an abandoned rail ROW along Commonwealth Avenue (CR 619) in Strathmere from W Prescott Road to 29th Street in Sea Isle City as shown in Map 2.

There are several proposed on-road facilities including:

- Roosevelt Boulevard from US Route 9 to the bike path on Haven Avenue
- Woodbine Road (CR 557) from Washington Avenue to Narrows Road
- Woods Road from Narrows Road to West Sunrise Road



Map 1- Location Map

- Upper Township
- Villages

Bicycle Conditions Analysis for Upper Township



- Narrows Road from Woodbine Road (CR 557) to Mt. Pleasant Tuckahoe Road (CR 664)
- Connection to Amanda's field from W Sunrise Road

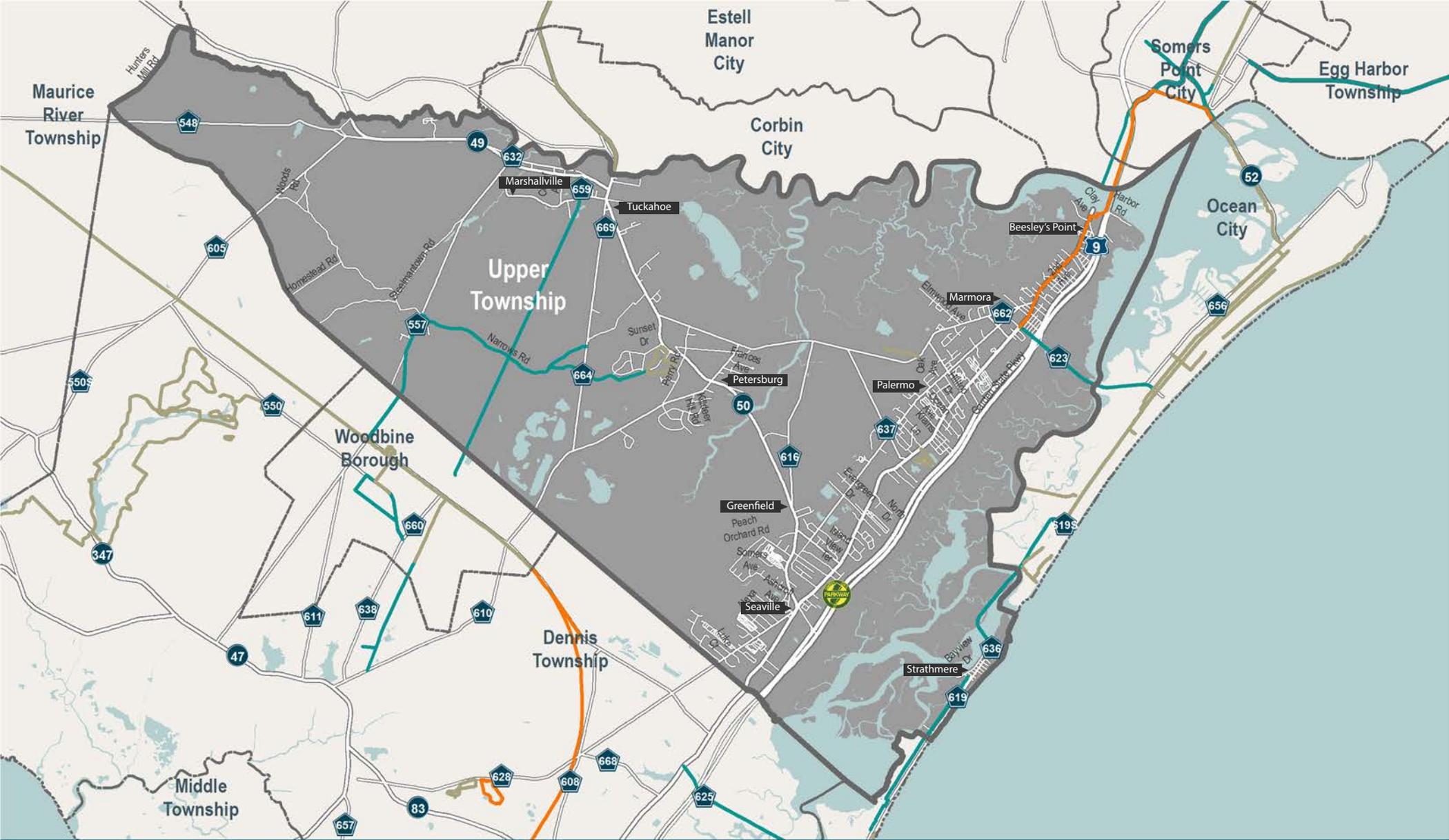
There is one funded project in Upper Township on North Shore Road from Roosevelt Boulevard (CR 623) to Harbor Road, continuing on Harbor Road to the newly constructed bike path on GSP/US 9 as shown in Map 2.

County and Regional Projects

As shown in Figure on the right, Cape May County has several existing, funded and proposed bicycle facilities throughout the County. These projects will foster regional connectivity within the County as well as connect to bicycle facilities in Atlantic and Cumberland Counties. These facilities are part of the overall regional network, making Upper Township's facilities critical links within this network. So, Upper Township bicycle facilities are essential to create a regionwide network of safe and accessible bicycle facilities.

Important regional connections include the multi-use path adjacent to the GSP/US Route 9 across the new Great Egg Harbor Bridge, sections of the High Point to Cape May Bike Route (NJ 50, NJ 49, and CR 557), and the multi-use path on Dehirsch Avenue from Petersburg Road (CR 610) to Weatherby Road (CR 548). Connectivity to these bicycle facilities within Upper Township would boost county-wide and regional connectivity. As discussed on page 4 several of these regional connections are already proposed by the County.





Bicycle Conditions Analysis for Upper Township

Map 2- Bicycle Facilities

- Existing Bike Facility
- Funded Bike Facility
- Proposed Bike Facility
- Villages





03 PUBLIC OUTREACH

Public involvement is a key component of any successful planning process. The goal of the public involvement process is to engage a broad and diverse group of residents, organizations and stakeholders to develop a plan that reflects the priorities and interests of both residents and visitors in the study area.

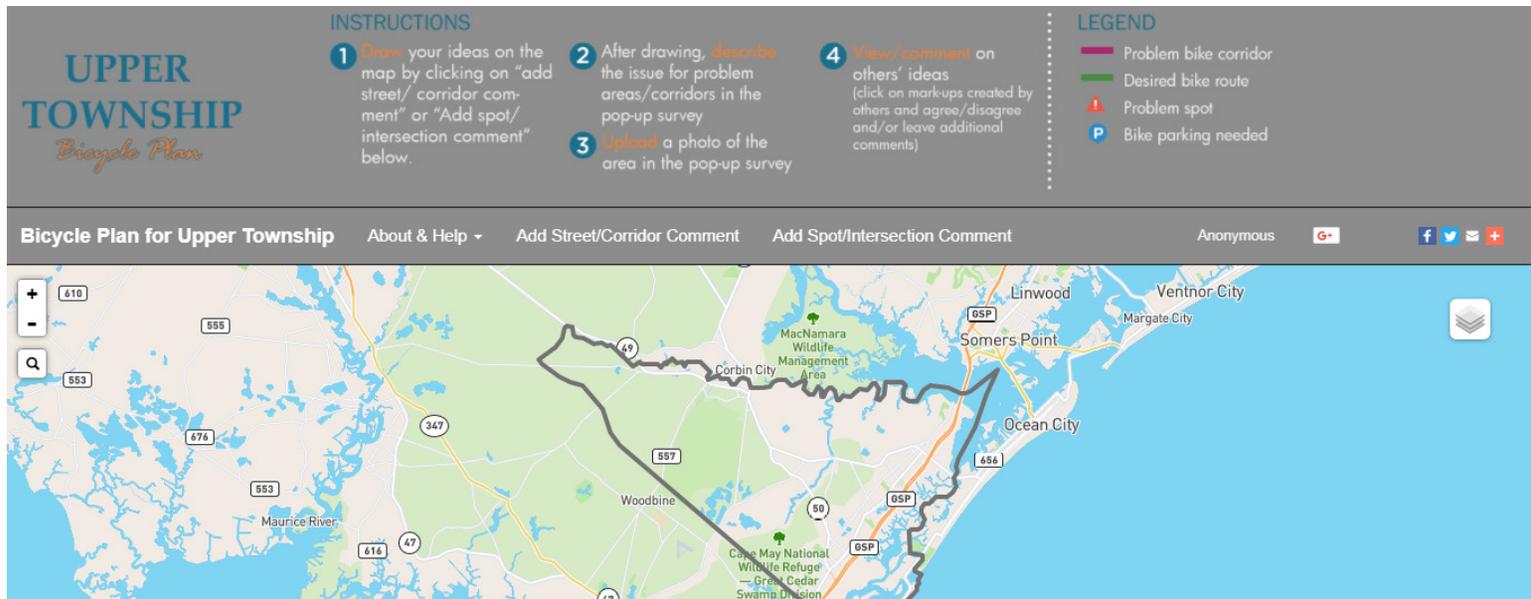
Through a variety of stakeholder meetings, public meetings, and online tools, the Bicycle Plan for Upper Township includes information and feedback on existing conditions for bicycling; key issues, challenges, and constraints related to bicycle infrastructure; and preferred routes. The input from the stakeholders and the community is key to the development of recommendations for this plan.

The following sections summarize the various activities and tools used to gather input for the plan for the development of the Bicycle Plan for Upper Township.

Steering Committee #1

Local input is a key element of this Township-wide plan. A Steering Committee was convened that included professional staff from Upper Township and representatives from Cape May County, the New Jersey Department of Transportation (NJDOT), South Jersey Transportation Planning Organization (SJTPO), and Upper Township Green Team. This group served as advocates for the plan and provided data, information, and input throughout the study.

The committee met at the Upper Township Community Center in July 2017 to introduce local stakeholders to the study process, discuss goals and objectives of the Plan and to gather preliminary input on major bicycling issues in the township. The project team presented their analysis of existing conditions and obtained feedback on data collection efforts, key bicycle generators, existing bicycle deficiencies, and other problem roadways and locations.



Wikimap

An online WikiMap was set up to allow members of the community and interested parties the ability to provide input and comment throughout the life of the planning process.

Steering Committee #2

The committee met at the Upper Township Community Center in May 2018 to discuss recommendations for Upper Township. The project team presented the recommendations and gathered feedback on the proposed improvements. The SAC meeting was an opportunity for members to review the recommendations and modifications since the previous SAC meeting. Several changes to the recommendations were made after receiving feedback from the SAC.

Public Meeting

A public open house for the Upper Township Bicycle Plan was held on October 1, 2018 at the Upper Township Municipal Building from 6 pm - 8 pm. Approximately 20 people attended the meeting. Representatives from local press were also present. Feedback was generally positive. Suggested modifications or additions included:

- Participants indicated need for better connectivity between the 10 villages in Upper Township.
- Need for better bicycle facilities on Commonwealth Avenue for beach accessibility.
- Better connectivity between Ocean City and Upper township through Roosevelt Boulevard.
- Participants liked the proposed bicycle connection on



North Shore Road and Harbor Road which will connect the Township to the new bike path on GSP and connect to township to Somers Point.

- Participants acknowledged need for speed limit reduction on County Roads to support bicycle connectivity
- Need for better regional connections to other parts of the county was indicated.
- Better bicycle connections to and from camp grounds throughout the township was also indicated.



04 EXISTING CONDITIONS

The existing conditions analysis has several components to better understand existing bicycle mobility in Upper Township. The project team gathered information on bicycle attractors and generators, crash history, key elements of the roadway network within the Township, and the roadway network's bicycle level of traffic stress. These components of the study were mapped to illustrate the existing bicycle network, and to determine areas of confluence among the study components that might indicate specific constraints and deficiencies for bicyclists.

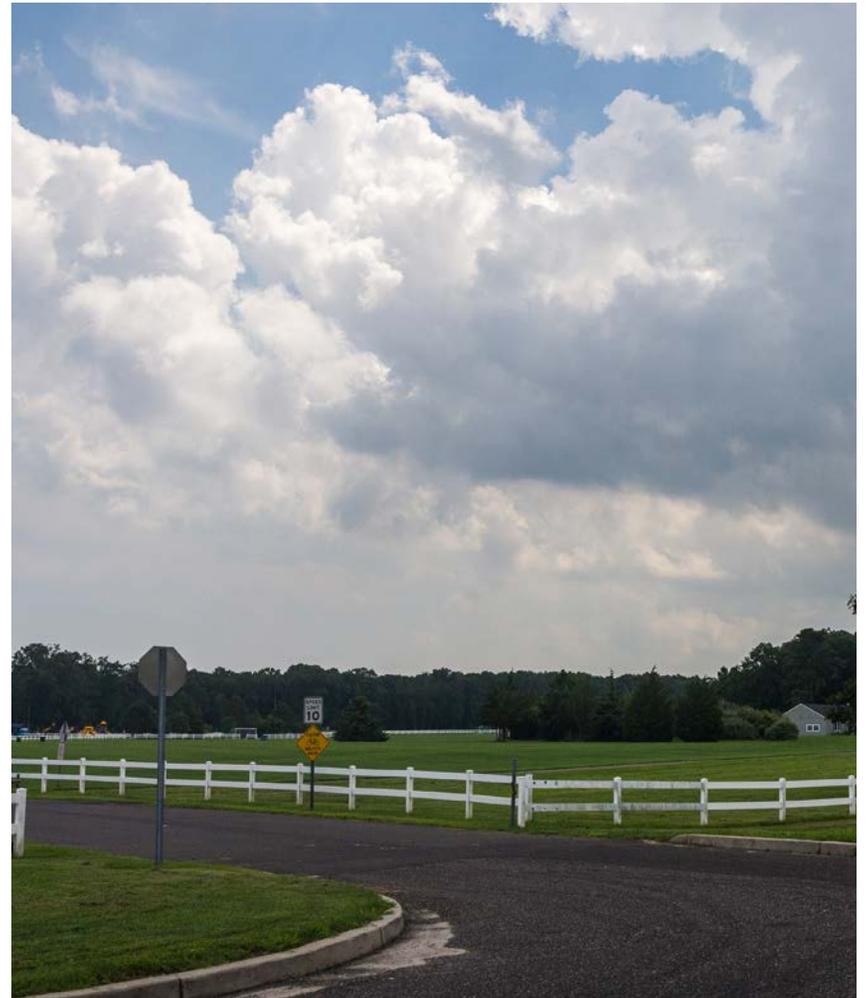
Attractors and Generators

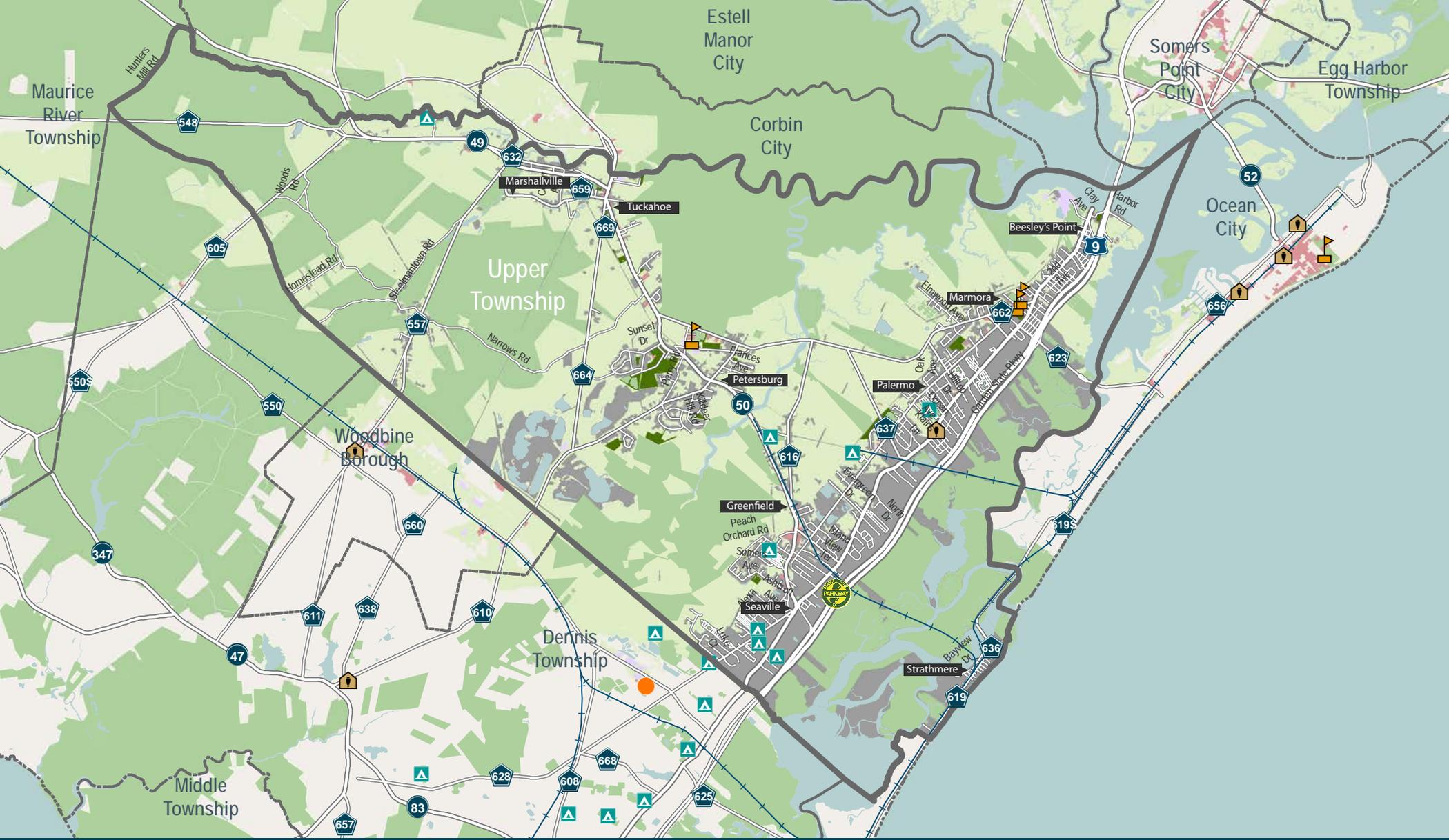
Locations that could attract or produce a high number of bicycle trips were inventoried and mapped, as shown in Map 3. Attractors and generators were divided among the following categories:

- Schools – There are four schools in the study area including two elementary schools, one middle school in Upper Township, and Ocean City High School in Ocean City, which is the receiving school for Upper Township students.
- Parks and open space – There are several municipal and county parks in the Township as well as state owned open spaces
- Municipal Buildings
- Cape May County Library- Upper Township branch.
- Recreation – Museums, libraries, senior centers, beaches
- Campgrounds – There are eight campgrounds in the township
- Commercial - Shopping areas



Clockwise from top-left (1) Narrows Road closed for vehicular access (2) Amanda's Field (3) Bicyclists on Roosevelt Avenue Bridge (4) Bicyclists on Stage Coach Road

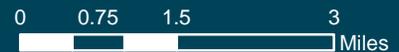




Bicycle Conditions Analysis for Upper Township

Map 3- Points of Interest

- | | | | |
|----------------------|------------|------------------------|----------------------------|
| Open Space and Parks | Commercial | Wineries and Breweries | NJ Railroad Network |
| Municipal Parks | Industrial | Museums | Abandoned |
| Beach | Wetlands | Campgrounds | Active |
| Villages | School | | |



Crash Analysis

Locations

The project team reviewed NJDOT crash data for the study area to identify the location of recent bicycle and pedestrian crashes and potential areas where repeated incidents or crash clusters exist. The analysis included data from 2011-2015 (inclusive) during which 12 crashes involving pedestrians and 12 crashes involving bicyclists were identified. This percentage of pedestrian crashes (50% of bicycle/pedestrian crashes) is lower than the statewide average where pedestrian crashes account for approximately 72% of all bicycle/pedestrian crashes.

The crash locations are shown in Map 4. The highest concentration of crashes occurred along US Route 9 and Stagecoach Road (CR 667).

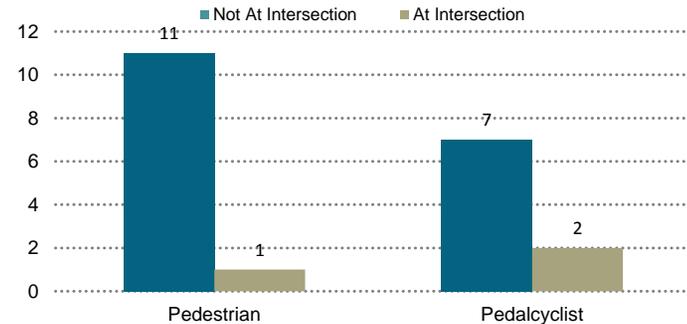
Analysis

The project team also analyzed the study area bicycle and pedestrian crash data in order to identify any common roadway, environmental, behavioral, or demographic factors in the data. Trends revealed in this data could indicate areas where targeted engineering, enforcement, or educational strategies might improve pedestrian and bicyclist safety.

As shown in Chart 1, 92 percent of pedestrian crashes (11 crashes) occurred at midblock locations. This is significantly higher than the statewide trend during the same analysis period, where 58 percent of all pedestrian crashes occurred at midblock locations. 78 percent (7 crashes) of bicyclist crashes occurred at midblock locations, while 22 percent occurred at intersections. This pattern is very different from the statewide trend for all bicyclist crashes, where more

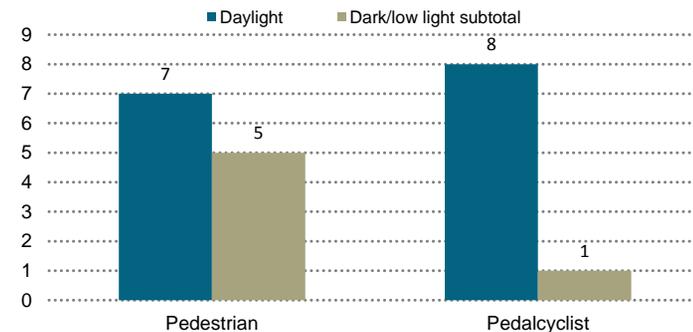
than half typically occur at intersections (44% at midblock locations, 56% at intersection).

Chart 1 - Crash Distribution by Location Type

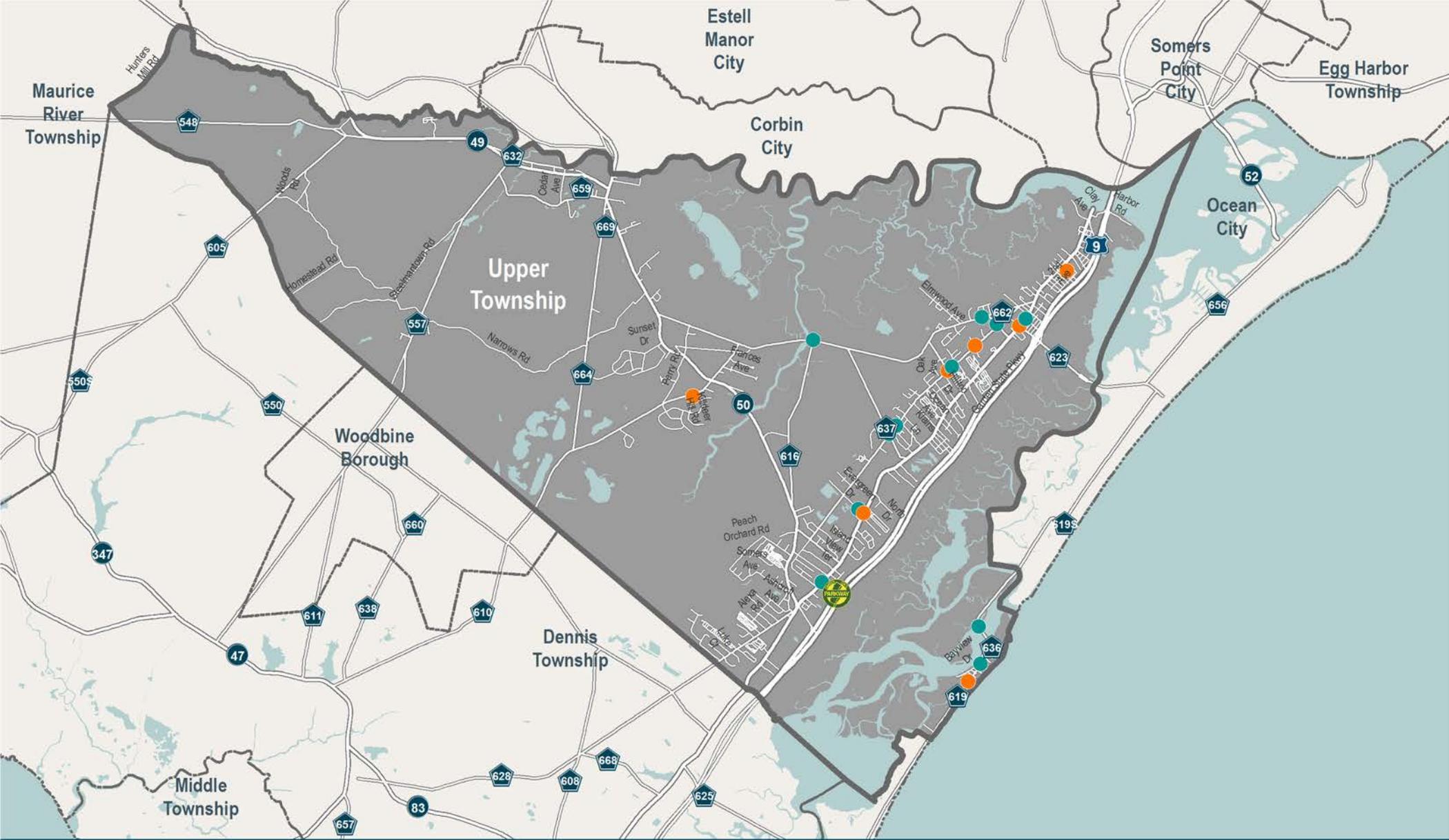


As shown in Chart 2, lighting was not a major factor in bicyclist crashes. Eight nine percent (8 crashes) of crashes occurred during daylight conditions.

Chart 2 - Crash Distribution by Lighting Condition



Among pedestrian crashes, 42 percent involved females and 58 percent males. Among bicyclist crashes, 17 percent



Bicycle Conditions Analysis for Upper Township

Map 4- Crash (2011-2015)

- Pedestrian Crash
- Bicyclist Crash



were female and 83 percent were male. Both are generally consistent with statewide and national trends, where males tend to be more frequently involved in pedestrian and bicyclist crashes. Chart 3 illustrates the distribution of crashes by gender.

Chart 3 - Crash Distribution by Gender

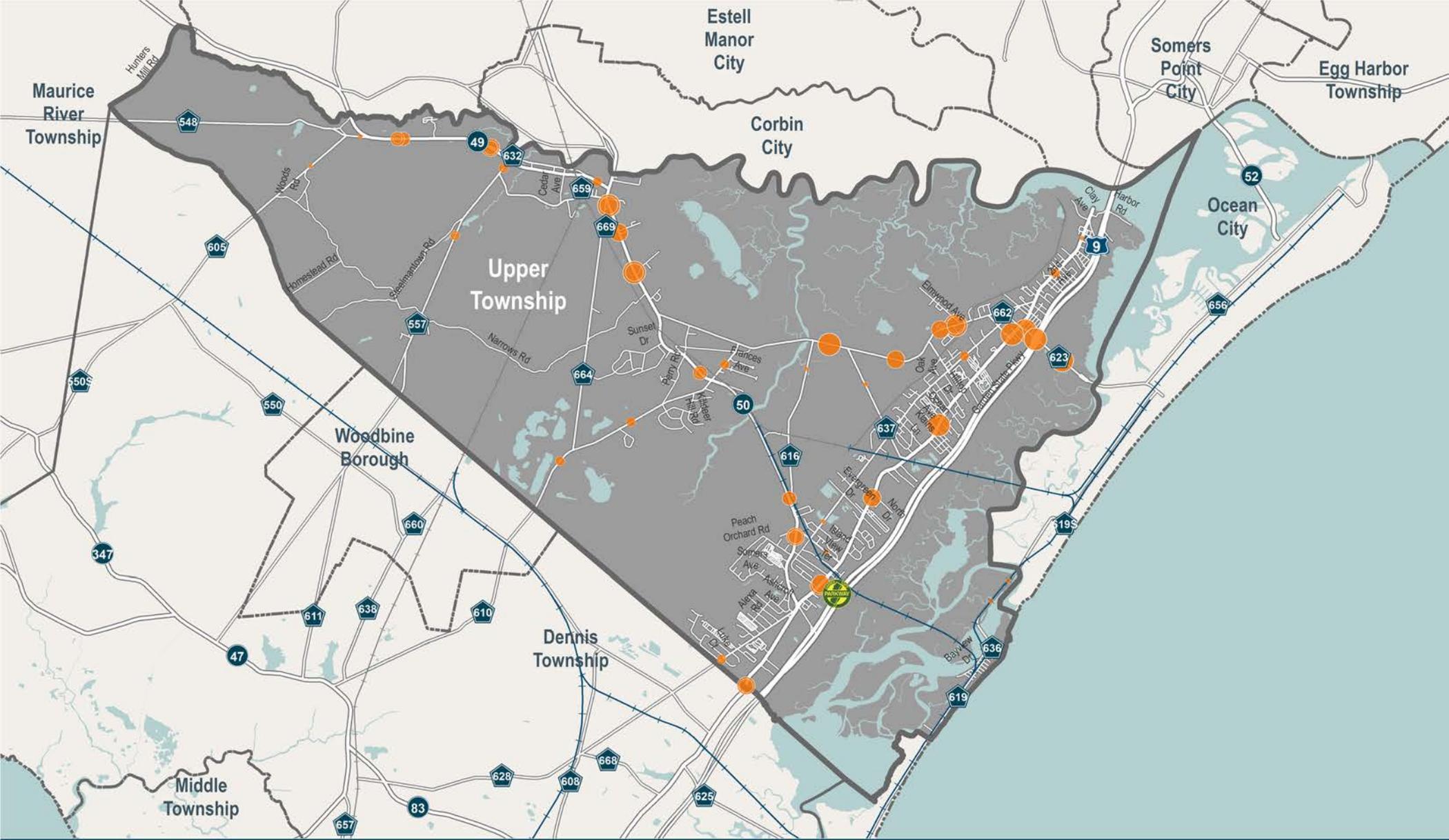


Traffic Volume Analysis

Traffic volume data was obtained from NJDOT from 2009-2015, during which 87 counts were conducted in Upper Township. The data has been collected on the roads shown in Table 3, which shows the latest data available on these roadways. As shown in Map 5 and Table 3, Roosevelt Boulevard (CR 623), Tuckahoe Road (CR 631), NJ 50, U.S. 9 and NJ 49 have substantially higher traffic volumes than the other routes surveyed within the township. These roadways are important links in the bicycle network.

Table 3 - Traffic Count Locations

Road	Mile Post	AADT	Year	Type
U.S. 9	25.55	9,603	2015	Class 48 hrs
NJ 49	52.00	8,620	2015	Vol 48 hrs
NJ 50	6.72	9,693	2015	Cont. Vol
CR 548 (Weatherby Road)	9.03	629	2013	Vol 48 hrs
CR 557 (Woodbine Road)	6.61	2,597	2013	Vol 48 hrs
CR 605 (Head of River Road)	2.72	853	2014	Class 48 hrs
CR 610 (Dennisville-Petersburg Road)	7.42	3,964	2014	Vol 48 hrs
CR 616 (Tyler Road)	1.96	671	2012	Major
CR 617 (Woodbine Road)	0.10	2,468	2015	Class 48 hrs
CR 619 (Bay Avenue)	16.4	1,635	2015	Major
CR 623 (Roosevelt Boulevard)	0.28	19,197	2014	Vol 48 hrs
CR 628 (Corsons Tavern Road)	5.55	3,294	2014	Vol 48 hrs
CR 631 (Tuckahoe Road)	4.46	10,380	2015	Vol 48 hrs
CR 637 (Butter Road)	1.20	913	2012	Major
CR 662 (North Old Tuckahoe Road)	0.34	1,208	2012	Vol 48 hrs
CR 667 (Stagecoach Road)	0.30	2,104	2012	Vol 48 Hrs
CR 671 (Hope Corsons Road)	0.52	1,318	2014	Vol 48 hrs



Map 5- Traffic Counts (2009-2015)

Bicycle Conditions Analysis for Upper Township

- 557 - 2,500
- 2,501 - 5,000
- 5,001 - 7,500
- 7,501 - 10,000
- >10,000



Bicycle Network Analysis

Bicycle facilities and infrastructure were inventoried in Upper Township. There are no existing on-street facilities in Upper Township.

Level of Traffic Stress

Bicycle Level of Traffic Stress (LTS) measures a bicyclist's potential comfort level given the current conditions of the roadway. Different bicyclists have different tolerances for stress created by the volume, speed, and proximity of automobile traffic. The LTS metric based on the Dutch concept of low-stress bicycle facilities. In general, lower stress facilities have increased separation between bicyclists and vehicular traffic and/or have lower speeds and lower traffic volumes. Higher stress environments generally involve bicyclists riding in close proximity to traffic, multi-lane roadways, and higher speeds or higher traffic volumes, a condition which is undesirable for the majority of bicyclist. A detailed look at the criteria used to determine LTS can be found in Appendix A. Based on an analysis of the criteria, the LTS for a given roadway segment is classified into one of four categories, as described in the box on the right.

The LTS was evaluated for all roads in the Township. The project team assessed major roadways and key minor roadways in the study area using a variety of data sources, including base mapping, GIS data files, NJDOT Straight Line Diagrams, and traffic data from NJDOT. The team also conducted field evaluations to take measurements and verify the various roadway features, character, parameters, and user behavior. For many local roads in the study area, basic assumptions were made for their typical characteristics.

Four Levels of Traffic Stress

The level of traffic stress analysis categorizes streets based on four levels. These level of stress categories, discussed below, were determined through significant research in the Netherlands, and adapted for the United States by researchers at Northeastern University.



1 | Most Users

Suitable for almost all cyclists, including children. On LTS 1 links, cyclists are either physically separated from traffic, in an exclusive bicycling zone next to slow traffic, or on a shared-street with a low speed differential.



2 | Most Adults

Suitable for most adults, but demands more attention than might be expected from children. Similar cross sections to LTS 1 but with more likeliness for interaction with motor vehicles.



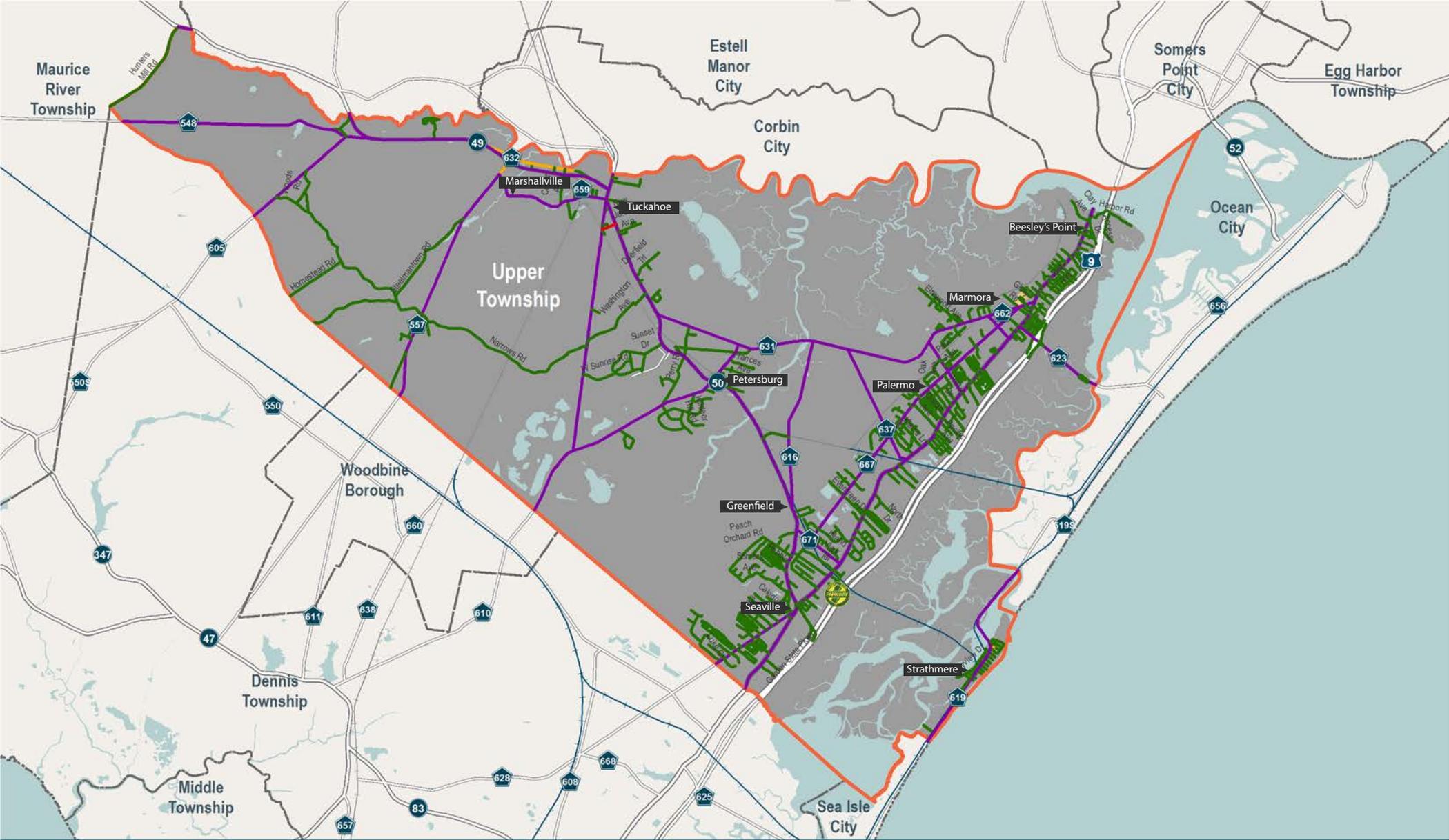
3 | Enthusiastic Riders

Welcoming level for many people currently riding bikes in this country. Cyclists either ride in an exclusive on-street lane next to moderate speed traffic or on shared lanes on non-multi-lane streets.



4 | Experienced Riders

Suitable only for the most experienced riders or not suitable for any riders. Roadway is characterizes by high travel speeds, multiple lanes, and/or are lacking in dedicated bicycle facilities.



Map 6- Bicycle Level of Traffic Stress

Bicycle Conditions Analysis for Upper Township

- Level of Stress 1
- Level of Stress 2
- Level of Stress 3
- Level of Stress 4
- Villages

0 0.75 1.5 3 Miles



Map 6 shows the bicycle level of traffic stress in Upper Township. The majority of roads in Upper Township are residential streets with low traffic speeds and volumes, making them LTS 1 roadways that are accessible for all users. There are four links in the Upper Township roadway network that are LTS 2 including CR 659 (Reading Avenue), CR 636 (Commonwealth Avenue), CR 617 (Woodbine Road), CR 632 (Marshallville Road). Only Marshall Avenue (CR 669) is LTS 3 in the roadway network. It is a two-lane residential street with a speed limit of 30 mph and therefore is a LTS 3 link. There are 18 roadways in the Upper Township road network that are LTS 4 as shown in Table 4 and Map 6. The roads that are LTS 4 are either County roads or State roads. Roads are categorized LTS 4 due to high speeds and/or high traffic volumes.

Table 4 - LTS 4 Roadways

LTS 4 Roadways	
US 9	CR 623
NJ 49	CR 628 (Corsons Tavern Road)
NJ 50	CR 631 (Tuckahoe Road)
CR 548 (Weatherby Road)	CR 637 (Butter Road)
CR 557 (Mill Road)	CR 662
CR 602 (Church Road)	CR 664 (Mt. Pleasant-Tuckahoe Road)
CR 605 (Head of River Road)	CR 667 (Stagecoach Road)
CR 610 (Dennisville-Petersburg Road)	CR 671
CR 616 (Tyler Road)	CR 619

Key Roadways

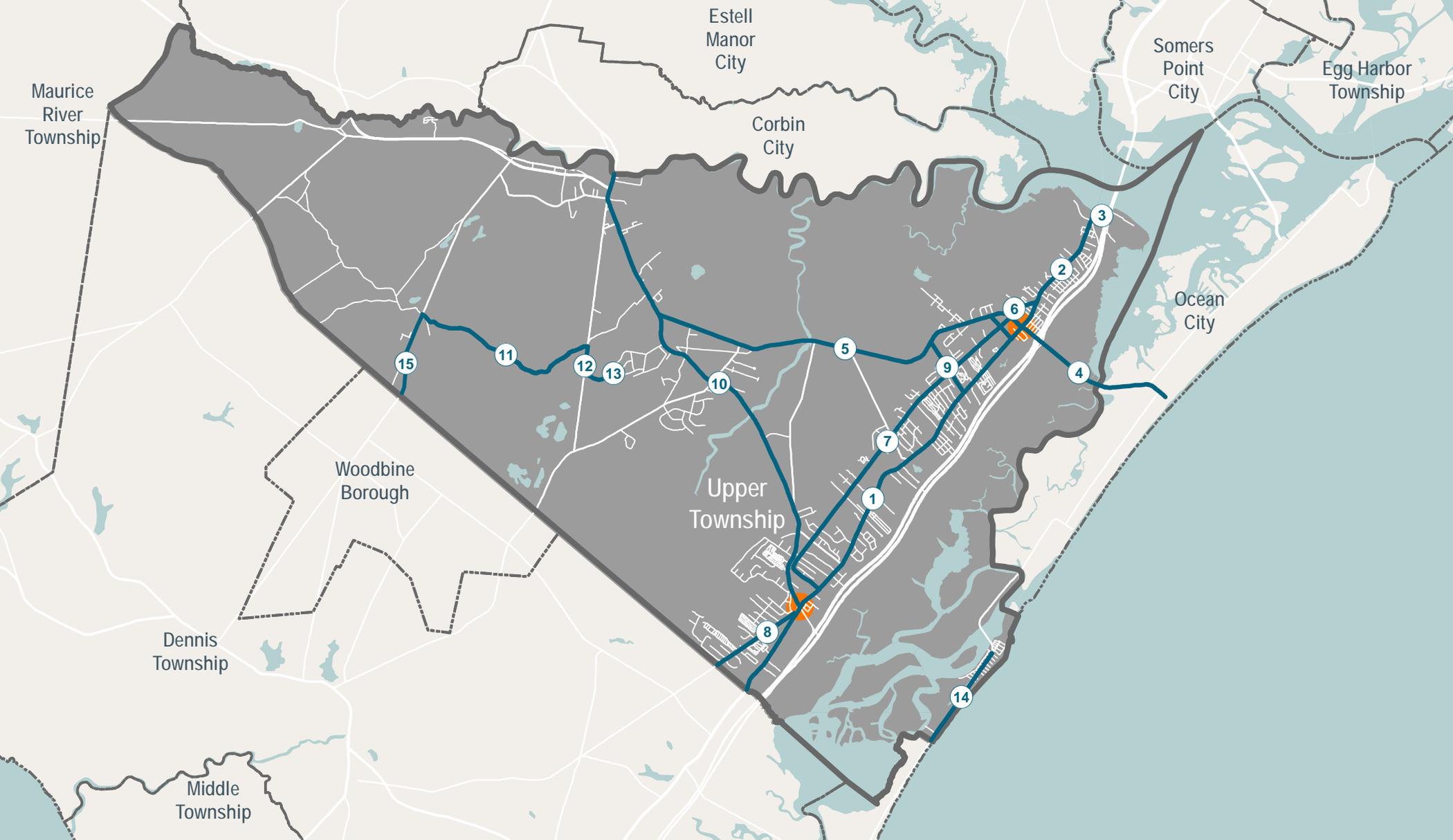
Priority Corridors and Intersections

The project team collected detailed information for several corridors and spot locations throughout the Township. The locations were identified as important links in the network due to the proximity of bicycle attractions, crash history, and/or existing deficiencies. The corridors selected for further analysis are as shown in Map 7:

- US Route 9
- North Shore Road
- Harbor Road
- Roosevelt Boulevard (CR 623)
- Tuckahoe Road (CR 631)
- North Old Tuckahoe Road (CR 662)
- Stage Coach Road (CR 667)
- Corsons Tavern Road (CR 628)
- Church Road (CR 602)
- NJ Route 50
- Narrows Road
- Mt-Pleasant-Tuckahoe Road (CR 664)
- West Sunrise Road
- Commonwealth Avenue (CR 619)

Following similar criteria, the project team also identified several intersections for field review:

- North Shore Road/US Route 9 and Roosevelt Boulevard
- US 9 and NJ 50



Map 7- Priority Corridors

- Priority Corridor
- Priority Intersection

Bicycle Conditions Analysis for Upper Township



Figure 1 - U.S. Route 9



U.S. Route 9

U.S. Route 9 is the primary north south artery for local traffic within Upper Township (the parallel Garden State Parkway serves primarily regional traffic). Within Upper Township Route 9 begins in the southeast portion of the Township as shown in Figure 1. The roadway travels north from the municipal boundary with Dennis Township to Roosevelt Boulevard (CR 623), where it begins concurrency with the Garden State Parkway, extending north into Somers Point in Atlantic County. The primary section of US Route 9 is a two-lane roadway with a speed limit of 50 mph. The cartway width of the road fluctuates between 28 and 35 feet with two 11 foot lanes and 3 to 6 foot shoulders adjacent to each travel lane.

Adjacent land uses along US Route 9 primarily are residential, commercial, or open space, including numerous campgrounds. In addition to being the primary north-south local route within Upper Township, this is an important corridor because it provides links to destinations within Ocean City and Somers Point.

Fourteen traffic counts were performed on this roadway between 2009-2015 including 48-hour volume and classification counts. The latest 48-hour classification count showed an AADT of 9,603 (2015), between CR 671 and CR 637 (Milepost 25.55).

There are no existing bicycle facilities on this roadway. Two bicyclist and two pedestrian crashes occurred on this roadway between 2010-2014. The LTS on this roadway is 4.

North Shore Road

North Shore Road is a former section of U.S. Route 9 that was decommissioned after the demolition of the Beesley's's Point Bridge. The limits of this roadway are from Roosevelt Boulevard (CR 623) to Harbor Road, just south of Great Egg Harbor. North Shore Road is important to the Upper Township Road network since it provides the most direct link to the new multi-use path on the new Great Egg Harbor Bridge. Cape May County has proposed a bicycle facility on North Shore Road as shown in Figure 2.

North Shore Road a two-lane roadway with a posted speed limit of 40 mph. The cartway width of the road varies between 35 and 38 feet with two 11 foot lanes and 6 to 8 foot shoulders adjacent to each travel lane.

Land uses along this corridor are primarily residential, with a school, and, some commercial properties, predominantly located at the northern terminus of the roadway including Tuckahoe Inn and Jet Ski rentals at Beesley's's Point Beach.

Three 48-hour traffic volume counts were performed on this roadway between 2009-2015. The latest 48-hour classification count showed an AADT of 1,862 (2013) between South Drive and Staples Court (Milepost 30.25).

There are no existing bicycle facilities on this roadway. One bicyclist crash occurred on this roadway between 2010-2014. The LTS on this roadway is 4, this is due to high speed limit.

Figure 2 - North Shore Road



Figure 3 - Harbor Road



Harbor Road

Harbor Road is in the northern most portion of Upper Township as shown in Figure 3. It is a dead-end street surrounded by residential, commercial and recreational (beach) land uses. Harbor Road extends from North Shore Road to approximately 0.4 miles east of the Garden State Parkway. North Shore Road is important to Upper Township's bicycle network as it is a low traffic road and links Upper Township to the new multi-use path on the Great Egg Harbor Bridge. There are no existing bicycle facilities on this roadway. Cape May County has proposed a bicycle facility on Harbor Road as shown in Map 2 on page 7.

This is a two-lane roadway with a cartway width of 21 feet with two 10.5 foot lanes and no shoulders.

Traffic volume data is not available for this roadway and no bicyclist or pedestrian crashes occurred on this roadway from 2011-2014. The LTS on this roadway is 1. Roadway configuration of Harbor Road provides limited connectivity therefore it is a low speed (25mph) and low volume facility.

Roosevelt Boulevard (CR 623)

Roosevelt Boulevard (CR 623) is the only direct connection between Ocean City and Upper Township. This roadway runs east-west as shown in Figure 4. Within Upper Township, the limits of Roosevelt Boulevard are Old Tuckahoe Road (CR 662) to the municipal boundary with Ocean City. Roosevelt Boulevard is primarily a three-lane roadway with one lane in each direction and a center turn lane. This configuration changes to two lanes with one lane in each direction approaching the Roosevelt Boulevard Bridge to Ocean City. The speed limit on this roadway is 40-45 mph. The cartway width of the road is 28 feet on the bridge and widens to 60 feet in the vicinity of the Garden State Parkway and U.S. Route 9.

Land uses adjacent to Roosevelt Boulevard are primarily residential, commercial, wetlands, and water. This is an important corridor for the Township bicycle network as it provides the only direct link between Upper Township and Ocean City.

Six traffic counts were performed on this roadway between 2009-2015 including 48-hour volume and classification counts. The latest 48-hour classification count showed an AADT of 19,197 (2015) and a truck percentage of 6.42 between Vernon Road and GSP northbound ramps (Milepost 0.28).

There are no existing bicycle facilities on this roadway. The LTS on this roadway is 4, this is due to the high speed limit and traffic volumes.

Figure 4 - Roosevelt Boulevard (CR 623)



Figure 5 - Tuckahoe Road (CR 631)



Tuckahoe Road (CR 631)

Tuckahoe Road (CR 631) is a primary east-west connector between the villages of Marmora/Palermo/ Beesley's Point and Petersburg. Tuckahoe Road links U.S. Route 9 in the south to NJ 50 in the north as shown in Figure 5. It is a two-lane roadway with a speed limit of 45 mph. The cartway width of the road varies between 30-33 feet with two 11 foot lanes and 4 or 5 foot shoulders adjacent to each travel lane.

Land uses adjacent to this roadway include residential, wetlands, water, and, open space.

Nine traffic counts were performed on this roadway between 2009-2015 including 48-hour volume and classification counts. The latest 48-hour classification count showed an AADT of 10,380 (2015), between Burley Road and Elmwood Avenue (Milepost 4.46).

There are no existing bicycle facilities on this roadway. Three bicyclist crashes occurred on this roadway between 2010-2014. The LTS on this roadway is 4, is due to the high speed limit and traffic volumes.

North Old Tuckahoe Road (CR 662)

North Old Tuckahoe Road (CR 662) is a connector between North Shore Road and Tuckahoe Road (CR 631). The roadway limits of this road are from North Shore Road to Tuckahoe Road (CR 631) as shown in Figure 6. This is an important connection in the roadway network because it provides access to the Upper Township Elementary School. It is a two-lane roadway with a speed limit of 40 mph. The cartway width of the road is 34 feet with two 11 foot lanes and a 6 foot shoulder adjacent to each travel lane.

Land uses adjacent to this roadway are primarily residential in addition to the school.

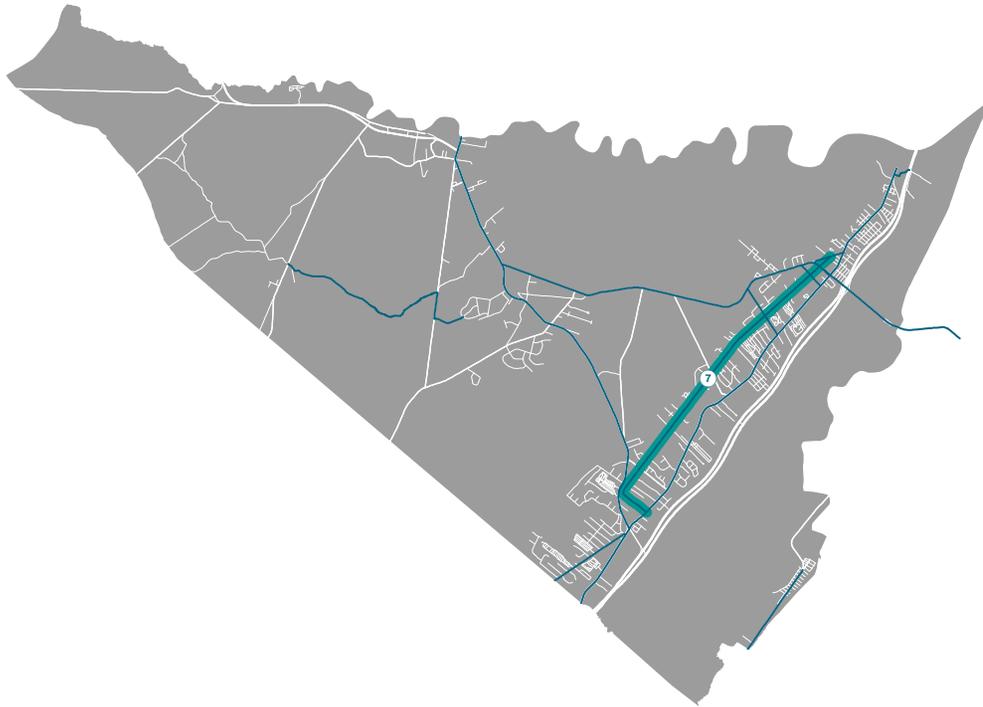
One traffic count was performed on this roadway between 2009-2015 with an AADT of 1,208 (2012 between Saint Martin's Place and Roosevelt Boulevard (Milepost 0.34).

There are no existing bicycle facilities on this roadway. No bicyclist or pedestrian crashes occurred on this roadway between 2010-2014. The LTS on this roadway is 4, due to the high speed limit.

Figure 6 - North Old Tuckahoe Road (CR 662)



Figure 7 - Stage Coach Road (CR 667)



Stage Coach Road (CR 667)

Stage Coach Road (CR 667) is located west of and parallel to U.S. Route 9. This roadway provides an alternate low stress route for vehicles of cyclists traveling north-south in Upper Township. The roadway limits are North Old Tuckahoe Road to the north and Old Stage Coach Road/U.S. Route 9 to the south as shown in Figure 7. It is a two-lane roadway with one lane in each direction. The speed limit on this roadway is primarily 35 mph, with a section posted as 25 mph between CR 671 to Old Stage Coach Road. The cartway width of the road varies between 36 and 43 feet with 7 to 10 shoulders adjacent to each travel lane.

Land uses adjacent to this roadway are primarily residential.

Two 48 -hour volume traffic counts were performed on this roadway between 2009-2014. The latest 48-hour classification count conducted showed an AADT of 2,104 (2012) between Brewhaus Lane and Evergreen Drive (Milepost 0.3).

There are no existing bicycle facilities on this roadway. The LTS on this roadway is 4 (North Old Tuckahoe Road to CR 671) due to high speed limit. Between CR 671 and U.S. Route 9 the roadway is an LTS 1 due to lower speed limit.

Corsons Tavern Road (CR 628)

Corsons Tavern Road is a north-south connector parallel to U.S. Route 9 linking Upper Township and Dennis Township. Corsons Tavern Road links Upper Township/Dennis Township boundary in the south with U.S. Route 9 as shown in Figure 8. Corsons Tavern Road is a two-lane roadway with a speed limit of 50 mph. The cartway width of the road varies between 34 and 36 feet with two 11 foot lanes and 5 to 7 foot shoulders adjacent to each travel lane.

Land uses adjacent to Corsons Tavern Road are primarily residential, and open space, including several campgrounds.

Two 48-hour traffic volume counts were performed between 2009-2015. The latest 48-hour classification count showed an AADT of 3,294 (2014) between Luke Court and Lauradell Drive (Milepost 5.55).

There are no existing bicycle facilities on this roadway and no pedestrian or bicyclist crashes occurred on this roadway between 2010-2014. The LTS on this roadway is 4, due to the high speed limit.

Figure 8 - Corsons Tavern Road (CR 628)



Figure 9 - Church Road (CR 602)



Church Road (CR 602)

Church Road (CR 602) is an east-west roadway between U.S. Route 9 and Tuckahoe Road (CR 631) as shown in Figure 9.

This is a two-lane roadway with a speed limit of 35 mph. The cartway width of the road varies between 32 and 34 feet with two 11 foot lanes and 5 or 6 foot shoulders adjacent to each travel lane.

Land uses adjacent to this roadway is primarily residential.

Traffic volume data is not available for this roadway. There are no existing bicycle facilities on this roadway. One pedestrian crash occurred on this roadway between 2011-2014. The LTS on this roadway is 4.

NJ Route 50

NJ 50 is an important roadway in Upper Township because it connects the villages of Seaville, Petersburg, and Tuckahoe. It also connects Upper Township to Corbin City and other municipalities to the north. The roadway limits of NJ 50 are from the Garden State Parkway to the south to NJ 49 in the north as shown in Figure 10. This is a two-lane roadway with a speed limit of 45 mph. The cartway width of the road varies between 38 and 40 feet with two 11 foot lanes and 7 to 9 foot shoulders adjacent to each travel lane.

Land uses adjacent to NJ 50 include residential, commercial, wetlands, and open space.

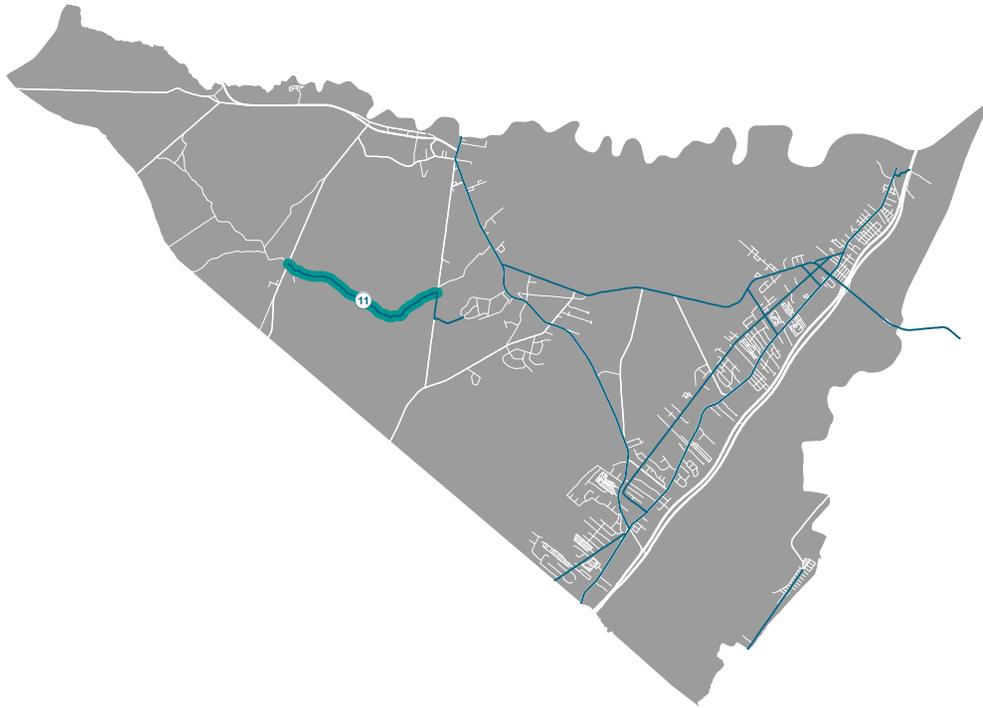
Eighteen traffic counts were performed on this roadway between 2009-2015 including 48-hour volume and classification counts. The most recent 48-hour classification count had an AADT of 5,984 (2015) and a truck percentage of 36.6 between CR 616 and CR 610 (Milepost 1.57).

There are no existing bicycle facilities on this roadway. No pedestrian or bicyclist crashes occurred on NJ 50 between 2010-2014. The LTS on this roadway is 4, due to the high speed limit and traffic volumes.

Figure 10 - NJ Route 50



Figure 11 - Narrows Road



Narrows Road

Narrows Road links CR 557 (Woodbine Road) and CR 664 (Mt. Pleasant-Tuckahoe Road) as shown in Figure 11. This is an important connection in the roadway network as this is the only east-west connection between Petersburg and Steelmantown. It also provides access to trails around Amanda’s Field. Narrows Road is not open to vehicles from CR 664 (Mt.Pleasant-Tuckahoe Road) as shown on Page 14. Narrows Road is accessible from CR 557 to cars.

This is a two-lane roadway with a speed limit of 25 mph. The cartway width of the road is between 16 and 20 feet with no shoulders.

Land uses adjacent to this roadway are primarily residential and open space (wetlands).

Traffic volume data is not available for this roadway and no crashes occurred on this roadway from 2010-2014. There are no existing bicycle facilities on this roadway. The LTS on this roadway is 1, due to the low speed limit.

Mt-Pleasant-Tuckahoe Road (CR 664)

Mt-Pleasant-Tuckahoe Road (CR 664) is a short but important connection between Narrows Road and West Sunrise Road. The roadway limits of CR 664 are shown in Figure 12. This is a two-lane roadway with a speed limit of 50 mph. The cartway width of CR 664 is 26 feet with two 11 foot lanes and 2 foot shoulders adjacent to each travel lane.

Land uses adjacent to this roadway are primarily wetlands and open space.

Traffic volume data is not available for this roadway and no crashes occurred from 2010-2014.

There are no existing bicycle facilities on this roadway. The LTS on this roadway is 4 due to the high speed limit.

Figure 12 - Mt-Pleasant-Tuckahoe Road (CR 664)



Figure 13 - West Sunrise Road



West Sunrise Road

West Sunrise Road is a local road that links Mt-Pleasant-Tuckahoe Road (CR 664) and North Sunset Drive (Figure 13). This is an important link for the bicycle and pedestrian network as it would provide access to the trail close to Amanda’s Field as well as Narrows Road. This is a two-lane roadway with a speed limit of 25 mph. The cartway width of the road varies between 22-24 feet with two 11-12 foot travel lanes and no shoulders.

Land use adjacent to the roadway include residential and open space.

Traffic volume data is not available for this roadway and no crashes occurred on this roadway from 2010-2014. LTS on this roadway is 1.

Commonwealth Avenue (CR 619)

Commonwealth Avenue (CR 619) is in Strathmere in Upper Township. It is an important regional connection linking Strathmere to Sea Isle City and Ocean City. The roadway limits of CR 619 are from Second Street to Williard Avenue/ Bay Avenue (Figure 14). This is a two-lane roadway with a speed limit of 35 mph. The cartway width of CR 619 is 36 feet with two 11 foot lanes and 7 foot shoulders adjacent to each travel lane.

Land uses adjacent to this roadway are primarily residential, beach and open space.

Traffic volume data is not available for this roadway and two crashes from 2010-2014.

There are no existing bicycle facilities on this roadway. There is a proposed off-road bicycle facility by Cape May County from West Prescott Road to Second Street connecting it to Sea Isle City. There is a proposed on-road bicycle facility on Bay Avenue (CR 619) from East Williard Avenue linking Strathmere to Ocean City. The LTS on this roadway is 4.

Figure 14 - Commonwealth Avenue (CR 619)

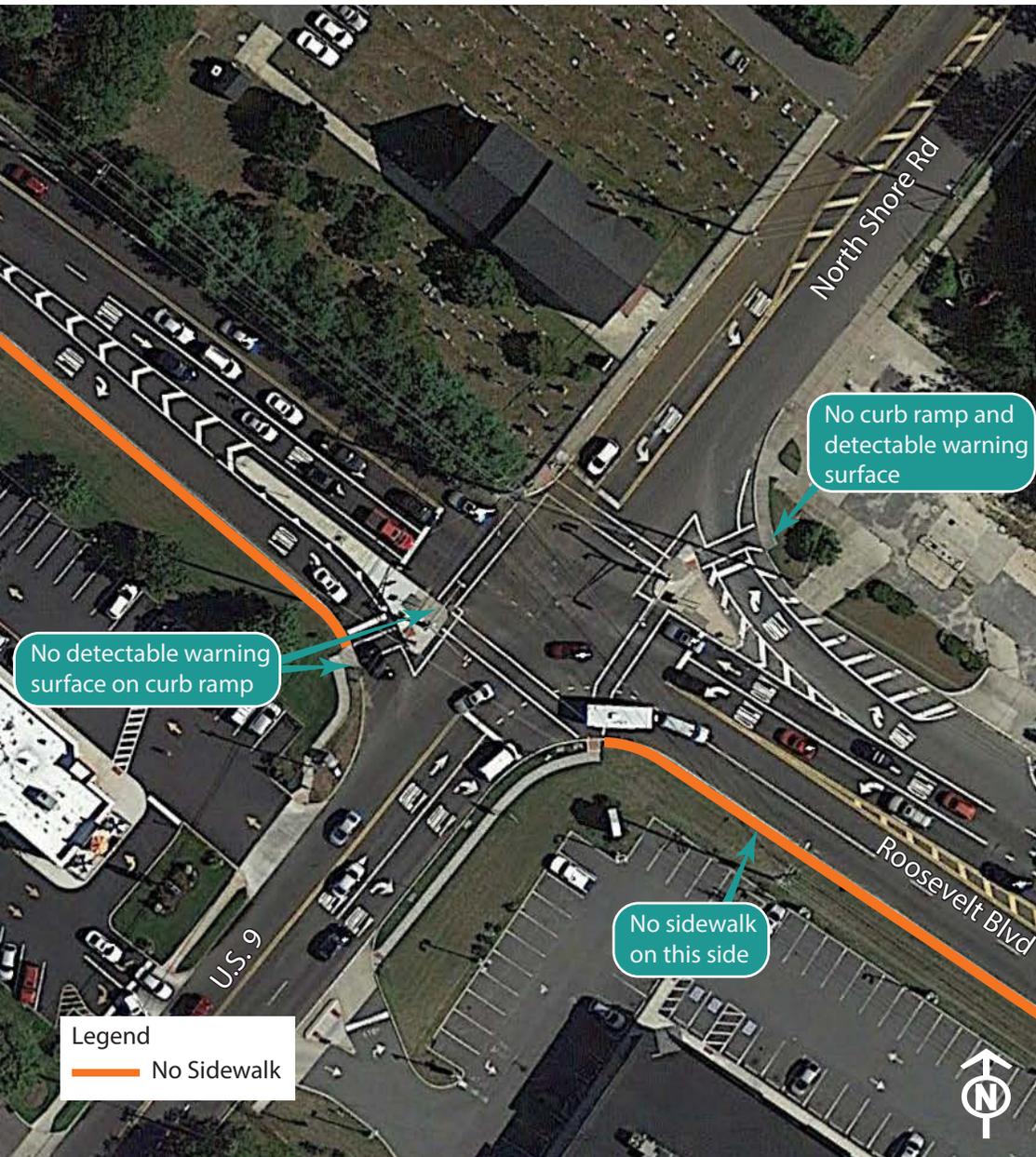


Priority Intersections

North Shore Road/US Route 9 and Roosevelt Boulevard

The intersection of North Shore Road/U.S. Route 9 and Roosevelt Boulevard (CR 623) is a critical node in Upper Township's roadway network (Map 7). It connects North Shore Road and Roosevelt Boulevard which have been identified as important corridors for bicyclists. The land uses adjacent to the intersection are primarily commercial.

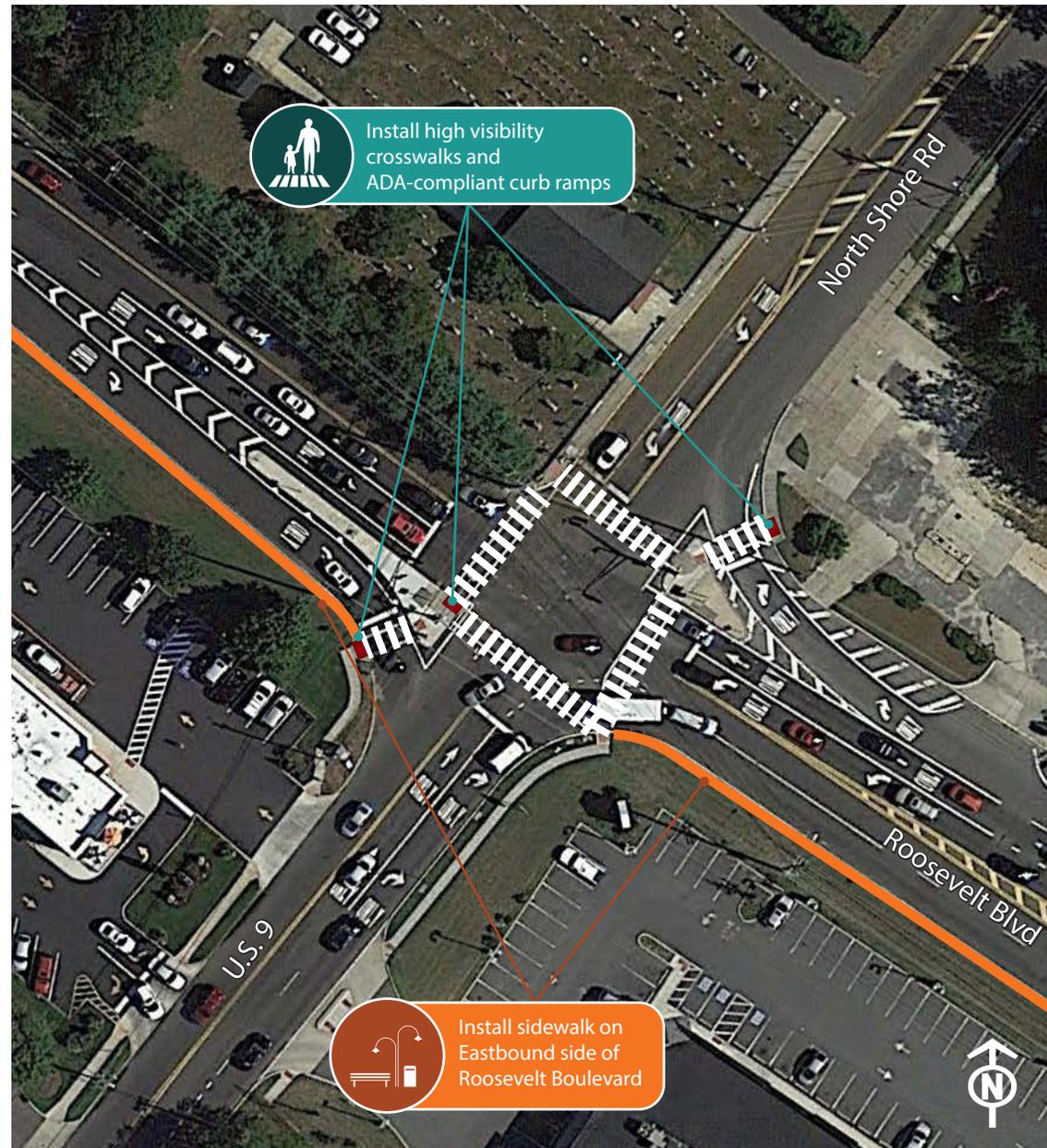
The westbound approach to the intersection lacks sidewalks. Both the east and westbound approaches of the intersection have channelized right turn lanes. The intersection has crosswalks with markings and ADA ramps on all corners. Issues at the intersection are illustrated in the figure on the left. This intersection has a challenging lane configuration which is difficult for bicyclists to navigate. Especially for bicyclists going to and from Ocean City to North Shore road. This is due to the presence of channelized right turns and left turn lanes on Roosevelt Boulevard which are used by vehicular traffic.



US 9 and NJ 50

The intersection of U.S. Route 9 and NJ 50 links two major roadways within Upper Township (Map 7). It also provides a connection to Corsons Tavern Road from US Route 9 to the south. Land uses adjacent to the intersection are primarily commercial.

The intersection lacks sidewalks at all four approaches which makes it difficult for both pedestrians and bicyclists to access the nearby commercial areas. The intersection is wide and lacks crosswalk markings. The intersection is not equipped with ADA accessible curb ramps at all four approaches as well as the on the channelized right turn island at the northbound and southbound approach. Issues at the intersection are illustrated in the figure on the right.



Trails and Parks

Existing trails and park connections

Upper Township's existing trails provide important off-road alternatives for biking and walking through the Township. The project team evaluated the condition of the trail network, with a focus on connections between parks and the existing trails.

Amanda's Field and the Petersburg Recreation Area used often by Upper Township residents when Mt Pleasant-Tuckahoe Road (CR 664) and NJ 50. Amanda's Field has existing trails that can provide access to new on-road and off-road facilities. The project team looked at potential connections between the trails and the existing road network.

Right-of-Way Conversion Opportunities

Upper Township has multiple rail and utility rights of way (ROW) that can be potentially leveraged for shared use as trails and multi-use paths. The project team inventoried and assessed the existing conditions during a field visit.

Rail Right-of-Way

As shown in Map 8, there are three identified rail ROW areas that have the potential to be converted into trails or multi-use paths as well as the proposed bicycle facility as discussed in Chapter 02 on page 6.

NJ 50 (2):

This abandoned rail right of way runs parallel to NJ 50 and cuts across Stage Coach Road, U.S. 9 and GSP and traverses

the wetlands towards Strathmere as shown in Map 8. This ROW is owned by NJ TRANSIT that can be potentially developed as an alternative bicycle route to NJ 50 providing a low stress connection between Seaville and Petersburg.

Rail Line to Ocean City (3):

This abandoned rail ROW cuts across Stage Coach Road, U.S. 9 and GSP and wetlands east of GSP (Map 8). This rail ROW is owned by the Atlantic City Electric Company Real Estate Department. This ROW has beautiful views of the wetlands and inlets (Corson Sound). It can potentially be developed as a trail connection with scenic vistas and possible long term connection to Ocean City.

BL England Generating Station Power Plant Freight Line (4):

This is a currently active freight line rail line in the north-eastern section of the Township serving the BL England Generating Station power plant (Map 8). This rail right of way could be deemed unnecessary if the Power Plant converts to natural gas and has the potential to be converted to a trail. This rail ROW is owned by Atlantic City Electric Company Real Estate Department. This connection may be used as an alternative to U.S. Route 9/North Shore Road.

Utility Right-of-Way

As shown in Map 8, several utilities rights of way were identified by the project team and later inspected in the field to evaluate their existing conditions and feasibility to be converted to trails/multi-use paths.

ROW #1, 2, 6 and 7:

As shown in Map 8, ROW locations 1, 2, 6 and 7 run through the center of Upper Township. These ROW areas are owned by the USA Fish and Wildlife Service and NJDEP, and can

potentially link the villages of Petersburg, and Tuckahoe. These ROWs can also provide access to Dennis Township to the south and Corbin City to the north. If converted to a bicycle facility, this ROW conversion can also provide access to Amanda's field and Narrows Road to the west.

ROW #3:

ROW location 3 connects CR 610 to NJ 49. This ROW is owned by NJDEP (Map 08). It goes through Belleplain State Forest and has scenic views. This ROW can provide connections from Steelmantown to other parts of Upper Township.

ROW # 4 and 5:

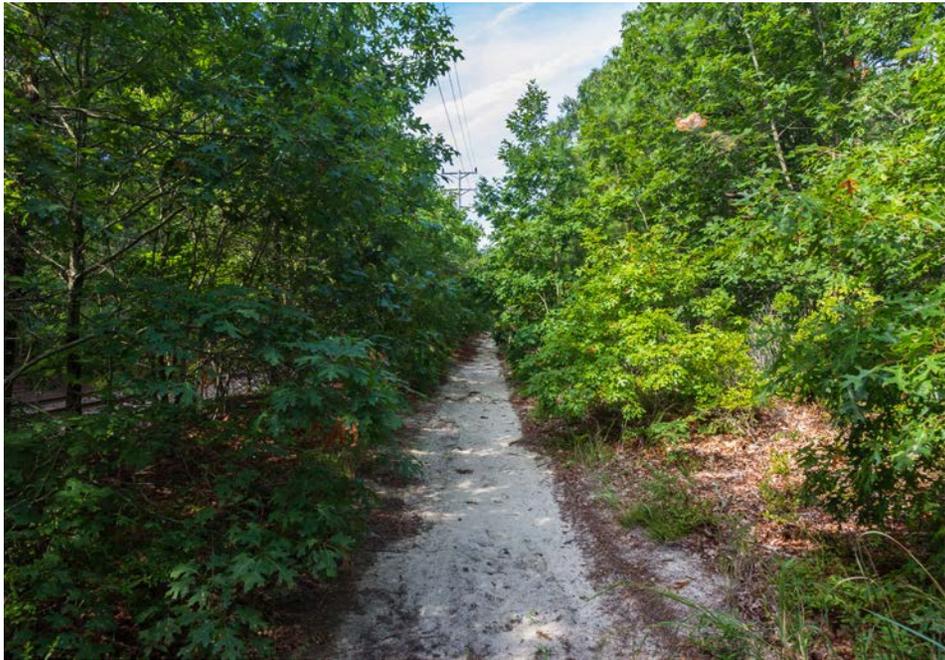
The ROW locations 4 and 5 can connect to the bicycle facility proposed by Cape May County on CR 557 and to CR 548 (Map 08). It can also connect Upper Township to Maurice River Township. These ROWs are owned by NJDEP.

ROW # 8:

This ROW is in Beesley's Point Village in Upper Township parallel to the Rail ROW owned by the Atlantic City Electric Department (Map 08). This ROW is also owned by the Atlantic City Electric Department. This ROW can provide access from the Upper Township Beach, Primary School and North Shore Road to CR 662 and other parts of Upper Township.

ROW # 9:

This ROW is a north-south connector beginning at CR 662 in Marmora and ending close to NJ 50 in Seaville (Map 08). This ROW is owned by USA Fish and Wildlife Service. It traverses wetlands and parks in Upper Township. This ROW can potentially connect campgrounds in Seaville and Marmora providing campers easy access to other parts of the Township.



Clockwise from top-left (1) Utility ROW close to the BL England Power Plant (#8) (2) Rail ROW #3 (Map 8) (3) Wetland views from Rail ROW #3





TUCKAHOE

TUCKAHOE

1781

M-607

AMTRAK

SEABOARD AIR LINES

05 PROGRAMS AND POLICIES

While proper design and physical infrastructure improvements are essential to creating a safe, comfortable, and convenient environment for biking and walking, they are only part of the process. Underlying policies and programs sponsored by the municipalities, as well as partnerships with non-governmental organizations or local businesses, can help create bicycle and pedestrian friendly communities, support and promote higher rates of biking and walking, and foster mutual respect among all roadway users. Efforts can include educational programs, encouragement initiatives, and enforcement activities. Appropriate travel behaviors and practices among bicyclists, pedestrians and drivers are essential to creating safe and accessible communities.

Education

Educational programs provide all roadway users – cyclists, pedestrians, and motorists – with information about their rights and responsibilities and applicable laws. These efforts can increase general awareness and promote courteous and safe interaction among all users. Educational programs may include a simple distribution of information in a wide

range of formats to improve motorist, cyclist, or pedestrian awareness and understanding of traffic laws and safe practices. Larger efforts could include a more structured, hands-on training program to improve individual skills and abilities. Educational programs should be tailored to specific audiences, such as school-age children, parents, adults, seniors, or motorists. Specific recommendations for Upper Township include:

- Continue efforts to distribute public service announcements (PSAs) and brochures on topics such as speeding, safe bicycling tips, how to bicycle with traffic, proper helmet usage, bicycle routes, and safe pedestrian behavior. Materials can be posted or distributed at the public library, municipal offices, schools, and/or at community events. PSAs may also be printed in the local newspaper or posted on Upper Township's website or social media sites. Resources with safety information and brochures include the Cross County Connection TMA; NJDOT's Biking in New Jersey and Pedestrian Safety websites; the Pedestrian and Bicycle Information Center, a national clearinghouse of information related to walking and biking sponsored by the FHWA; and the

National Highway Traffic Safety Administration (NHTSA).

- Emphasize distribution of information to seasonal visitors including tourists using the many campgrounds in the Township, many of whom bike or walk frequently while visiting, but may not do so regularly in their hometown. To reach this target audience, brochures and displays related to safe bicycling tips, bicycle routes, and bicycle traffic law should be available at bike rental locations, and bike shops in the Upper Township village centers, as well as directly available at campgrounds or through local property rental agencies.
- Work with neighboring municipalities and Cross County Connection to develop a brochure tailored to the unique needs of Shore communities as it relates to biking and walking, tourism, and informing seasonal visitors.
- For locations where on-street bicycle facilities are recommended, adjacent residents should be provided with guidance on how to properly place garbage or recycling containers to ensure that they do not block striped bicycle routes.
- Integrate bicycle and pedestrian educational programs into the school curriculum. The Upper Township Primary and Elementary Schools are in Marmora, making it within a comfortable walking or biking distance for students living in nearby villages within the Township. The Upper Township Middle School is in Petersburg village close to the village center which is also within walking and biking distance from nearby villages. To support and foster safe biking and walking to and from school, as well as to develop lifelong habits, educational programs tailored for children should be an important element of the overall community campaign. Several types of resources are available:
 - Traffic Safety Learning Progression Component: Funded

by the Division of Highway Traffic Safety and developed by Kean and Rowan Universities, the curriculum includes lessons on pedestrian, bicycle, and traffic safety. It is an on-going educational program, with lesson plans on several pedestrian safety issues tailored to each age group with interactive activities. These materials are available to all New Jersey schools free of charge. Kindergarten through Grade 8 lesson plans can be found at <https://bianj.org/prevention/childhood-safety/pedestrian-safety/> and Grade 9-12 lesson plans at <http://www.njdrivereducation.com/lesson-plans>.

- Safe Routes to School (SRTS): Resources are available through SRTS, a Federal and state program designed to enable and encourage children to walk and bike to school. Education is a key element when developing a SRTS plan. Information is available through the NJDOT program office, the Federal Highway Administration, and the National Center for Safe Routes to School. Cross County Connection is available to establish SRTS non-infrastructure programs in Cape May County, having already done so in Woodbine and West Cape May Boroughs.
- Other programs, such as WalkSafe™, BikeSafe™, and Safe Kids also offer educational materials and other activities focused on school-aged children.
- Partner with local community groups, schools, the police department, businesses, local advocacy groups, or other interested parties to organize bicycle training through the League of American Bicyclists (LAB). The LAB offers a range of courses by certified instructors for different ages and different abilities. These interactive training courses are a good way to educate cyclists on traffic rules and safety equipment, as well as to practice cycling skills that enable novices and experts to ride confidently and safely with traffic.
- Upper Township does not currently have a Complete Streets policy currently. Stakeholders should encourage the Township to adopt a Complete Streets



Education campaigns can address all roadway users, such as the South Jersey Traffic Safety Alliance, or target specific issues, such as recent signage installed in West Cape May to address wrong-way cycling.



policy. Adopting a Complete Streets policy improves transportation options, access to opportunities, safety, physical health, environmental quality, and community and economic vitality. A Complete Streets policy ensures that all users of the roadway are routinely considered in transportation projects and provided with safe, convenient, affordable, and equitable transportation options. Finally, it affirms the Township's commitment to improving roadway conditions for all users.

- Provide training for local officials, planners, engineers, and public works staff to support Complete Streets implementation. Providing training on effective implementation and maintenance will help make it part of all future transportation investments in Upper Township. NJDOT has resources available online and periodically provides training workshops throughout New Jersey.

- Cross County Connection TMA also provides technical expertise and educational resources to support local Complete Street initiatives, including:
 - Periodic workshops on Complete Streets
 - “Lunch and Learn” training seminars upon request that can be targeted to specific topics pertinent to a community, such as drafting a policy or selecting the best type of infrastructure improvements to meet user needs and fit the local context
 - Presentations to municipal and county staff on a variety of topics related to Complete Streets
 - Complete Streets policy examples and templates
 - Assistance in drafting a Complete Streets policy that considers the unique context of the municipality
 - Support in creating a Complete Streets Implementation Plan and Implementation Checklist according to NJDOT guidelines

- Guidance and examples on best practices in Complete Streets design
- Identification of funding sources for Complete Streets projects and assisting with grant applications

Encouragement

Encouraging active modes of transportation such as walking and biking has a host of benefits for residents and the community, including better health, reduced road congestion, support for local businesses, reduced environmental impact, and lower per-trip costs. By supporting and promoting walking and bicycling activities, Upper Township can spur a change in travel habits among residents and visitors, and entice more residents to walk and bike more regularly. Recommendations include:

- Encourage the use of “Walking School Buses” and “Bike Trains” to promote physical activity for children and parents traveling to and from schools. Walking school buses and bike trains provide an organized and supervised way for children to walk and bike to school, particularly for younger children, and can make walking and biking a fun, social activity. Work with school staff, parent volunteers, and the police department to organize the events. Assistance is available through the Cross County Connection TMA.
- Utilize resources through SRTS and Cross County Connection TMA to provide activities that encourage bicycling and walking at local schools, such as bike rodeos or other events.
- Publish an online bike map on Upper Township’s website, highlighting the location of bike lanes, off-road facilities, preferred on-road cycling routes, bike parking, and



Bike trains are a fun way to promote biking to school, and provide supervision for younger children
(Source: Center for Urban Transportation Research)

major destinations (schools, businesses, etc). Providing information on Upper Township’s bicycle facilities and best routes can encourage more people to try cycling. Resources include the bike network evaluated in this report, as well as the statewide map currently under development by NJDOT. Cross County Connection TMA also offers assistance in creating electronic and printable bike maps.

- Highlight pedestrian and bicycle improvements that accompany transportation projects through press releases, websites, and social media. By focusing on these elements and improved conditions, more people will be encouraged to walk and bike.
- Apply to become a Bicycle or Walk Friendly Community. These programs, sponsored by the League of American Bicyclists and the Federal Highway Administration,

respectively, will not only encourage bicycle use by residents, but serve as a potential marketing tool to encourage visitors to travel to the study area.

- Market Upper Township’s bicycling and walking assets, including its connections to Somers Point and Ocean City as well as other commercial areas, historical landmarks, parks, and beaches. Work with local businesses to publicize the communities’ resources, promote tourism, and emphasize Upper Township as a regional destination for biking and walking.

Enforcement

Combined with education, enforcement is a key element to ensuring safe travel for all roadway users. While the police department cannot dedicate a significant amount of resources to enforce traffic regulations, targeted enforcement campaigns, through warnings and tickets, are effective at correcting unsafe behaviors. Enforcement should apply to both motorists (speeding, failure to stop for pedestrians) and cyclists (riding on the wrong side of the street, failure to adhere to traffic control devices). Study area-specific recommendations include:

- Implement a pedestrian safety enforcement (PSE) program. A key resource for local police departments is the PSE program sponsored by the NJ Division of Highway Traffic Safety (NJDOT) with support from NJDOT. The PSE program provides a structured approach to crosswalk compliance enforcement, with training and support for local police officers. It addresses two important contributing factors to pedestrian crashes: driver knowledge of the law and driver yielding behavior. A variety of resources for enforcement are available

through the NJDHTS, including grant funding. PSE training workshops are also available through the NJ Bicycle and Pedestrian Resource Center. One common PSE program supported by the NJDHTS is the “Cops in Crosswalks” decoy program. Used in municipalities throughout New Jersey, the program is a targeted enforcement campaign. A plainclothes police officer attempts to cross a marked crosswalk, and drivers who fail to stop for the pedestrian are given a warning or citation. NJDOT provided additional information about PSE programs and resources in its Pedestrian Safety Action Plan Toolbox.

- Institute a community-oriented traffic calming campaign to help raise awareness about speeding and safety.



Example mobile radar unit in Highland Park, NJ



06 IMPROVEMENTS

This chapter describes infrastructure improvements to enhance bicycling in Upper Township. Recommendations focus on key corridors and intersections in Upper Township.

A primary outcome of this plan is the development of bicycle infrastructure improvements for targeted locations and corridors based upon the existing conditions analysis and input provided by the Study Advisory Committee. Building upon existing bicycle and pedestrian facilities, these improvements focus on improving safety, comfort, and circulation opportunities to and from major activity centers. Recommended bicycle improvements are focused on creating a low-stress, township-wide bicycle network linking recreational, commercial, and residential areas throughout Upper Township.

Improvement concepts are generally intended to be easily implementable and emphasize low-cost options, such as restriping of existing roadways or enhanced signage. The improvements also include conversion of inactive or underutilized right of ways to multi-use paths. These conversions are based on availability of funding and acquisition of right of ways. The improvement concepts also highlight projects that may be implemented over time as funding allows and incorporated into routine roadway maintenance at minimal additional cost. The list of recommended projects may be used to support grant applications, integrate bicycle and pedestrian projects into the capital improvement pipeline, and/or identify bicycle and pedestrian improvements as roadways are due for maintenance and resurfacing.

Pedestrian Improvements

Based on the results of field visits, data analysis, and stakeholder input, as detailed in the existing conditions section, pedestrian improvement recommendations were developed for targeted intersections within Upper Township. For each location, an aerial view is shown depicting recommendations. These improvements are intended to be conceptual recommendations that will likely require varying levels of design or further analysis, depending on the magnitude of the improvement.

North Shore Road/US Route 9 and Roosevelt Boulevard

The intersection of North Shore Road/U.S. Route 9 and Roosevelt Boulevard (CR 623) is a critical node in Upper Township's roadway network. It connects North Shore Road and Roosevelt Boulevard which have been identified as important corridors for bicyclists. Further, this intersection is ranked the 20th highest hot spot for pedestrian crashes in Cape May County.¹ Proposed improvements, illustrated to the left, seek to provide marked pedestrian crossings at key crossing locations.

Short Term

- Install ADA-compliant curb ramps and high visibility continental crosswalks on all approaches at the intersection.

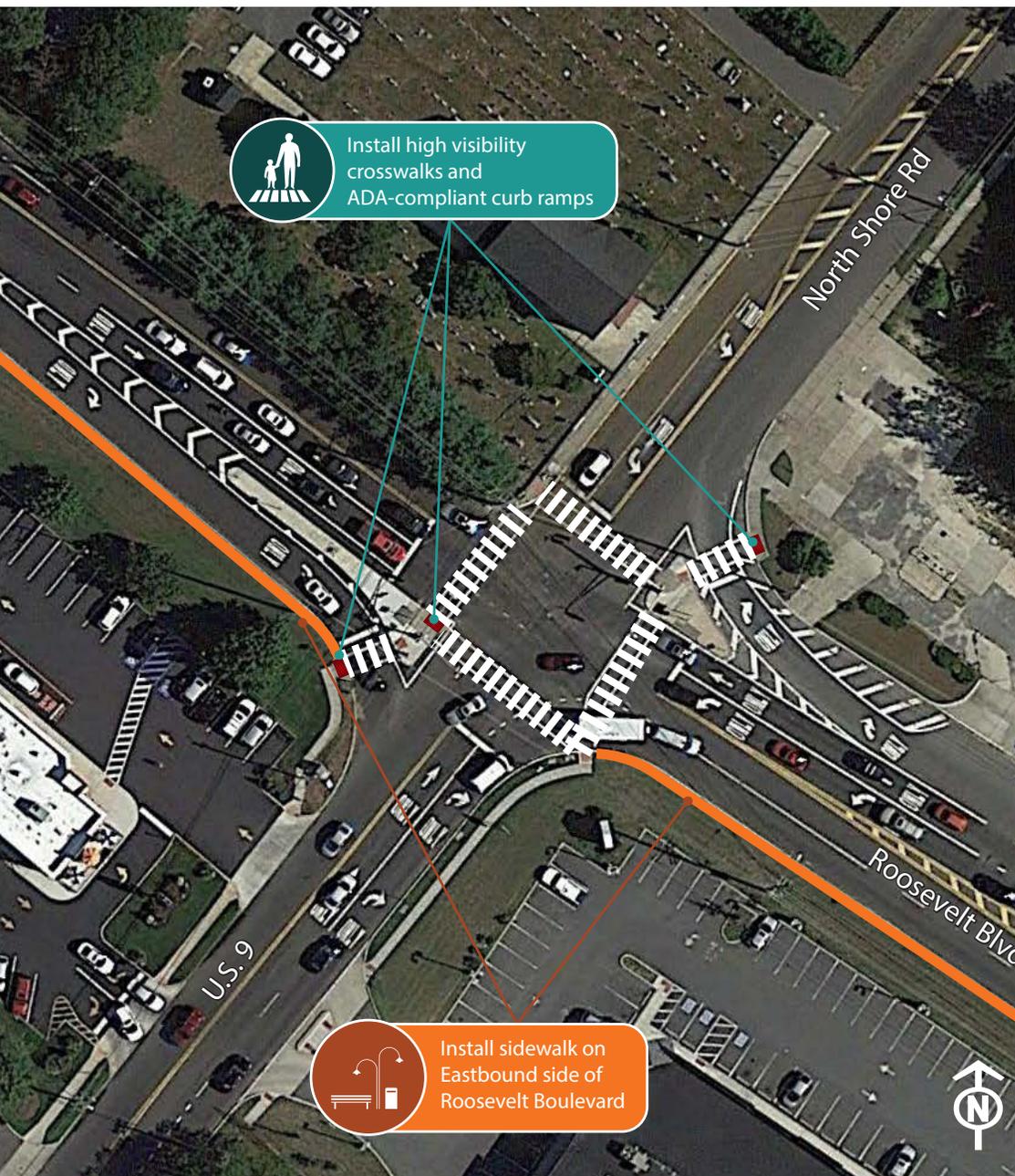
Long Term

- Complete sidewalk network on eastbound side of Roosevelt Avenue providing access to the commercial areas.

Cost Estimate

Short Term: \$6,800

Long Term: \$24,600



¹ "Pedestrian Spot Crash Location Ranking, Cape May County," SJTPO, http://www.sjtpo.org/wp-content/uploads/2016/06/PedSpot_CapeMay.pdf

US 9 and NJ 50

The intersection of U.S. Route 9 and NJ 50 links two major roadways within Upper Township. It also provides a connection to Corsons Tavern Road from US Route 9 to the south. Land uses adjacent to the intersection are primarily commercial. Proposed improvements, illustrated to the right, seek to provide marked pedestrian crossings at key crossing locations. Improvements at this intersection should be coordinated with proposed improvements for planned interchange improvements on the Garden State Parkway (Exit 24) at NJ 50.

Short Term

- Install ADA-compliant curb ramps and high visibility continental crosswalks on all approaches at the intersection.

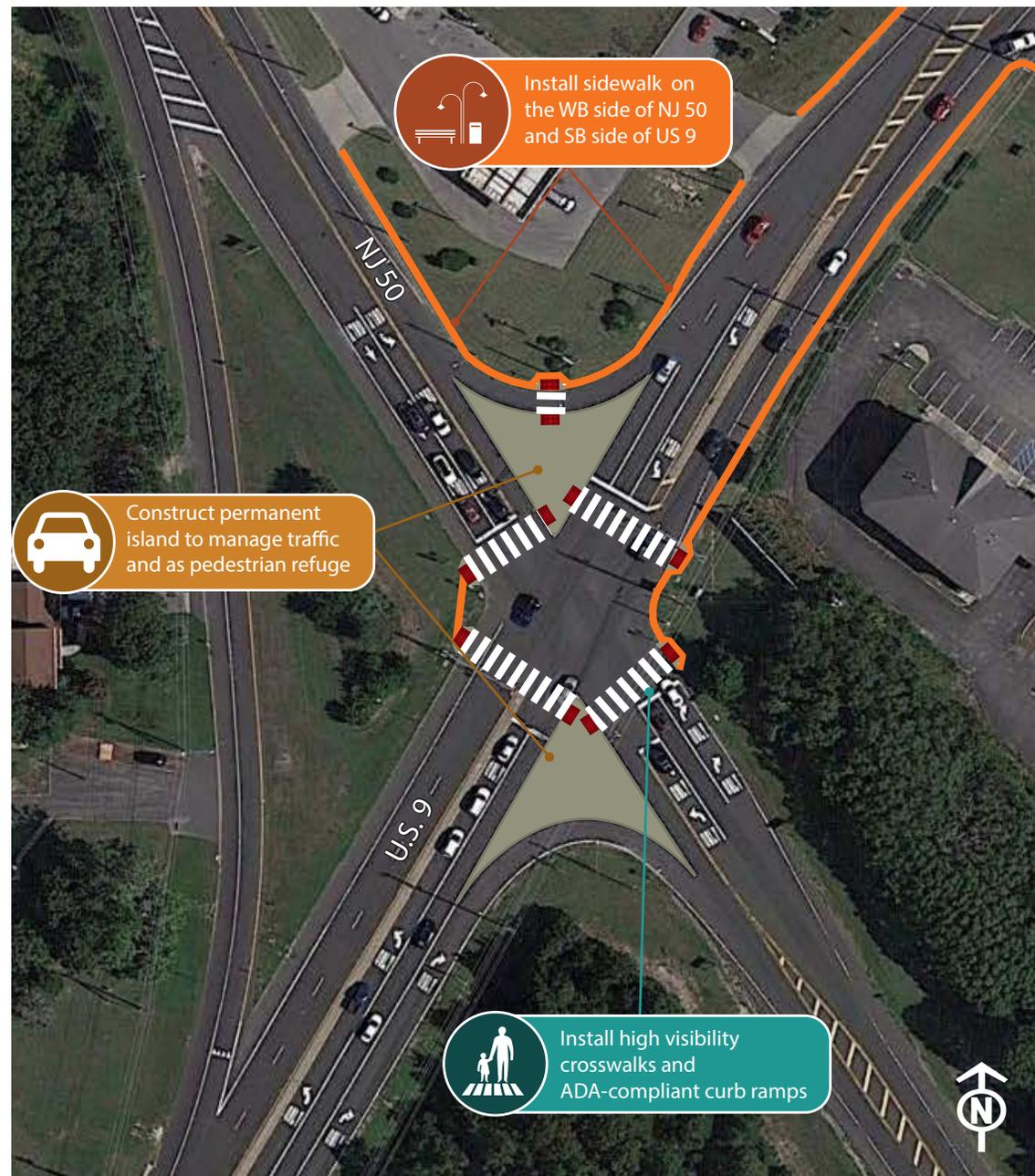
Long Term

- Install permanent raised island to regulate separate traffic and provide a pedestrian crossing refuge at the intersection as shown in illustration on the right.

Cost Estimate

Short Term: \$12,400

Long Term: \$72,400



Bicycle Network

Upper Township is made up of 10 small villages. Some villages are surrounded by wetlands, which act as barriers to connectivity between villages. The plan seeks to create a more cohesive and interconnected community by using improved bicycle linkages within and between Upper Township's ten villages while retaining and enhancing the unique and distinct character of each.

The proposed bicycle network outlined in this section aims to expand the existing and County-proposed bicycle facilities to create a more complete bicycle network that is comfortable for most users and conveniently connects key origins and destinations.

Development of the Network

Based on the analysis summarized in the Existing Conditions chapter and input from the Study Advisory Committee, the project team identified network improvements guided by:

- Existing bicycle lanes and trails: Building around existing facilities to enhance network connectivity and leverage existing infrastructure
- Major destinations: Seeking opportunities to provide convenient access to key destinations
- Inter-village and inter-municipal linkages: Identifying opportunities to create a more comfortable bicycle connection between Township villages and surrounding municipalities.
- Bicycle level of traffic stress (LTS): Utilizing the existing conditions LTS analysis as a guide to identify high traffic stress roadways and develop targeted recommendations

to improve user comfort and connectivity of the low stress network

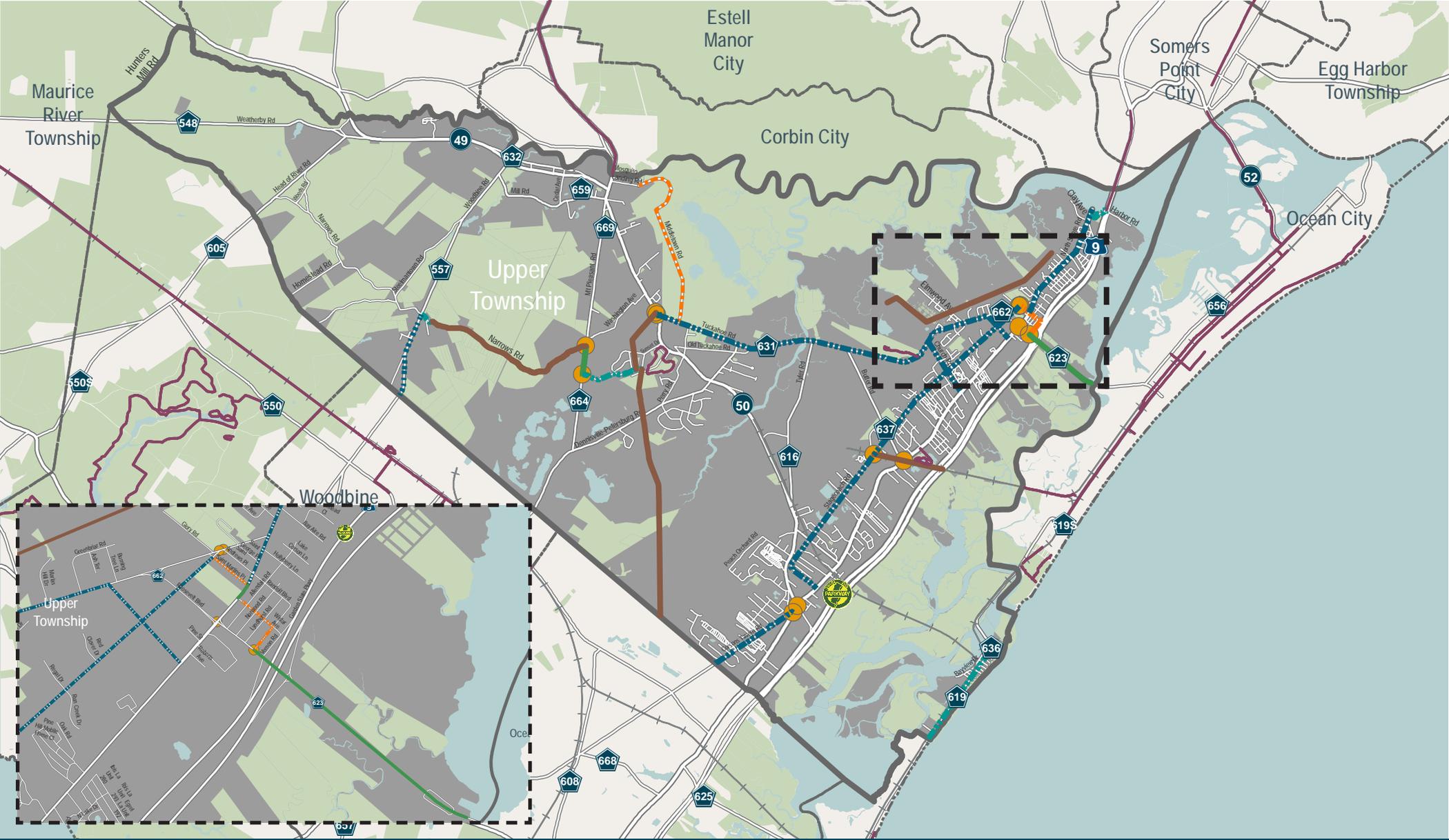
- Roadway constraints: Prioritizing easily implementable improvements that can be constructed within existing roadway widths with minimal disruption to current roadway configurations and existing on-street parking
- Environmental constraints: Considering potential constraints and permitting requirements necessary to implement off-road trail facilities

Bicycle Improvements

The proposed bicycle improvements are shown in Map 9 on the next page. As discussed in the following pages, the recommendations are divided into three categories: off-road trails, bicycle lanes, and shared lane markings.

Right-of-Way Conversion Opportunities and Off-Road Facilities

Upper Township's existing trails provide important off-road alternatives for biking and walking through the Township. The project team evaluated the condition of the trail network, with a focus on connections between parks and the existing trails. The Township also has multiple rail and utility rights of way (ROW) that can be potentially leveraged for shared use as trails and multi-use paths. The project team inventoried and assessed the existing conditions during a field visit. The proposed off-road improvements are shown in the Map 01 on the next page.



Map 9 - Bicycle Recommendations

Bicycle Conditions Analysis for Upper Township

- Bike Boulevard
- Bike Lane
- Cycle Track
- Multi Use Trail
- Shared Lane
- Existing Bike Facility
- Enhanced Crossing
- Open Space and Parks



Facility Type | Bicycle Lane

Bicycle lanes provide a dedicated space for bicyclists within the roadway through the use of striping, pavement markings, and/or signage. They enable bicyclists to ride at their preferred speed with minimal interference from vehicular traffic, and help facilitate predictable behavior between motorists and bicyclists.

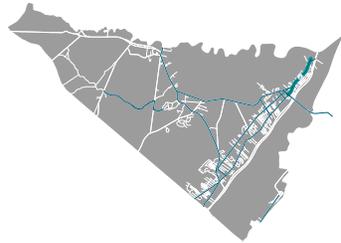
Bicycle lanes should be a minimum of 5 feet wide, and motor vehicle lanes should typically be 10 – 11 feet wide. When there is additional roadway width available, the excess space can be used to stripe a buffer between the travel lane and bicycle lane. The buffer enhances bicyclist comfort by increasing separation from traffic and visually narrowing the travel lane to help reduce motor vehicle speeds. Additional design details can be found in NACTO's "Urban Bikeway Design Guide", and NJDOT's "Complete Streets Design Guide".

Bicycle lanes are recommended on the following roadways:

- North Shore Road
- Tuckahoe Road (CR 631)
- Stagecoach Road (CR 667)
- Corsons Tavern Road (CR 628)
- Narrows Road
- Church Road (CR 602)
- Woodbine Road (CR 619)



Cape May City, NJ



North Shore Road

Location

The limits of this segment are from Saint Martin's Place to Harbor Road, just south of Great Egg Harbor. Cape May County has proposed a bicycle facility on North Shore Road. The speed limit on the roadway is 40 mph.

Project Overview

North Shore Road a two-lane roadway with a posted speed limit of 40 mph. The cartway width of the road varies between 35 and 38 feet with two 11 foot lanes and 6 to 8 foot shoulders adjacent to each travel lane. The recommendations include converting shoulders to 5 foot bike lanes and reducing the speed limit to 30 mph as shown in cross section on the right. Further, North Shore Road should be reclassified from an Urban Minor Arterial roadway to a Rural Minor Connector, given the substantial

Cartway Width: 35'-38'

Speed Limit: 40 mph

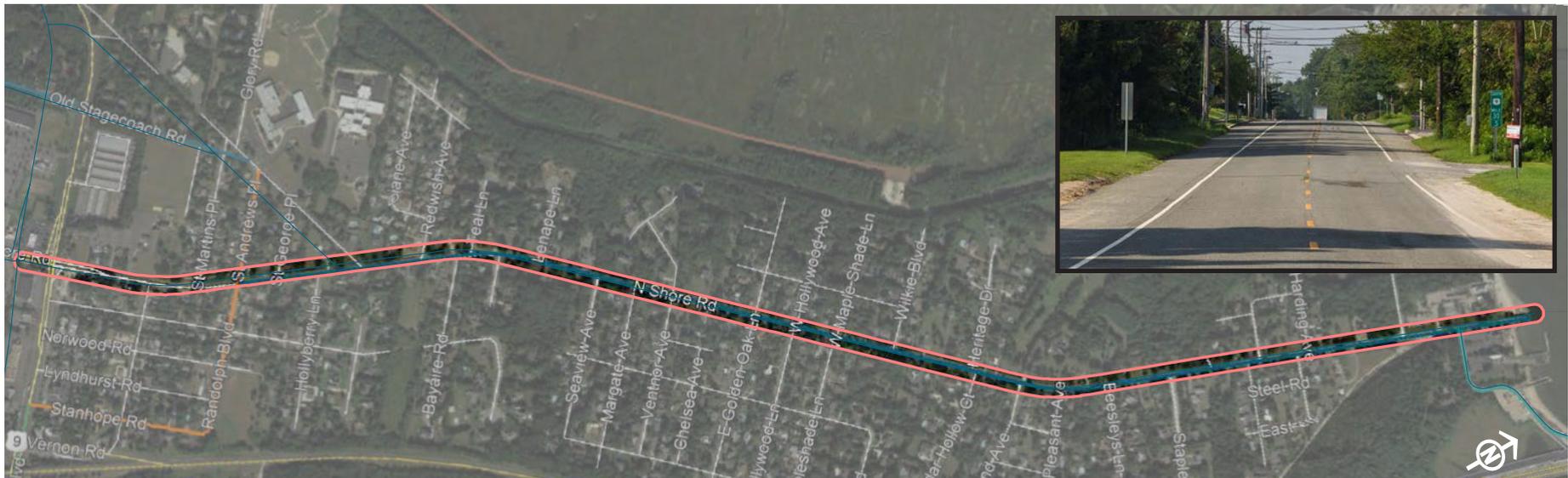
Cost Estimate

Short Term: \$28,300

Proposed



change in typical use with the closure of the Beesley's Point Bridge. Upper Township should work with NJDOT to identify opportunities to modify proposed striping plans currently being developed to modify the current layout to accommodate bike lanes. Proposed LTS for this segment reduced from LTS 4 to 1.





Tuckahoe Road (CR 631)

Location

Tuckahoe Road (CR 631) is a primary east-west connector between the villages of Marmora/Palermo/ Beesley's Point and Petersburg. Tuckahoe Road links U.S. Route 9 in the south to NJ 50 in the north.

Project Overview

Tuckahoe Road is a two-lane roadway with a speed limit of 50 mph from NJ 50 to CR 602 and 45 mph from CR 602 to CR 662 and 35 mph from CR 662 to US 9. The cartway width of the road varies between 30-33 feet with two 11 foot lanes and 4 or 5 foot shoulders adjacent to each travel lane. The recommendations include converting shoulders to 5 foot bike lanes as shown in cross section on the right and reducing the speed limit along the western section of the roadway to 40 mph. Where the current width of Tuckahoe Road allows, a buffered bicycle lane should be considered to increase separation between motor vehicles and cyclists.

Cartway Width: 30'-33'

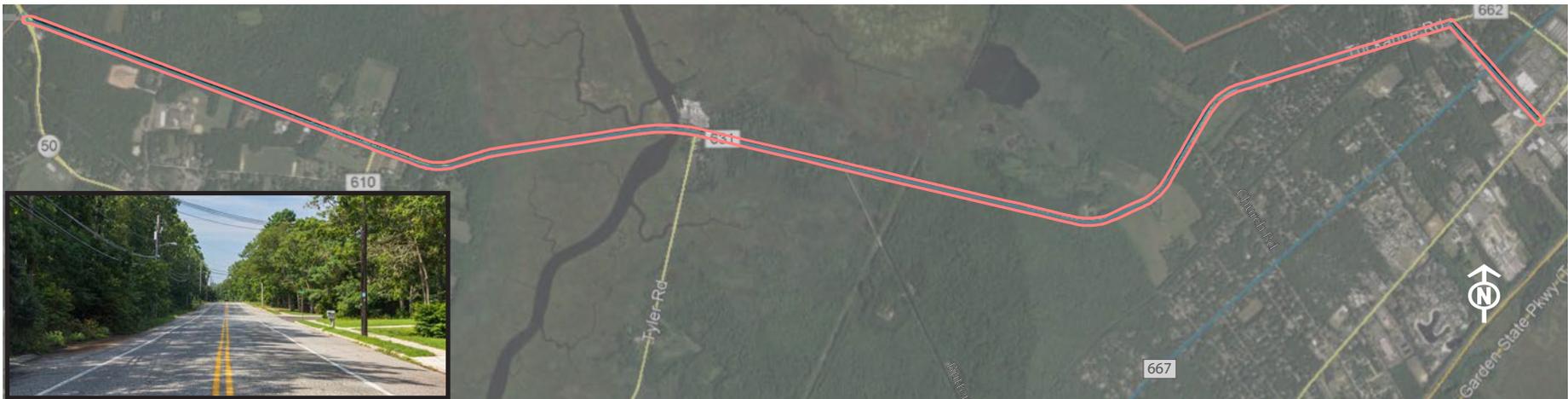
Speed Limit: 35-50 mph

Cost Estimate

Mid-Term: \$87,500



In order to achieve the proposed lower posted speed limit, Tuckahoe Road should be reclassified from an Urban Major Collector to a Rural Major Collector. Further, FHWA provides guidance on adjusting 85th percentile speeds, including those for rural residential or developed areas where there is a higher potential for pedestrian (or) bicycle traffic.² Additional treatments along this corridor may provide increased visibility for cyclists, including signing/branding as a bicycle route, or a colored shoulder treatment. LTS for this segment remains LTS 4.



²"Methods and Practices for Setting Speed Limits," FHWA Safety Program, 2012, p13



Stagecoach Road (CR 667)

Location

Stagecoach Road (CR 667) is located west of and parallel to U.S. Route 9. The roadway limits are North Old Tuckahoe Road and Old Stage Coach Road/U.S. Route 9 to the south.

Project Overview

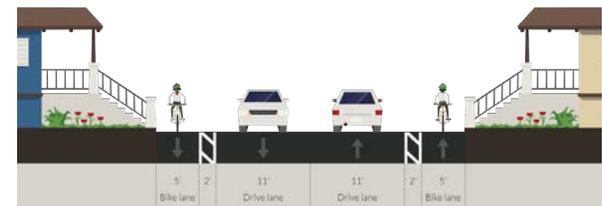
Stagecoach Road is a two-lane roadway with one lane in each direction. The speed limit on this roadway is primarily 35 mph, with a section posted as 25 mph between CR 671 to Old Stage Coach Road. The roadway has 7' to 10' shoulders adjacent to each travel lane. The recommendations include converting shoulders to 5 foot bike lanes with painted buffer separation as shown in the cross section on the right. Prior to this conversion, a review of on-street parking needs should be advanced to confirm that all properties on Stagecoach Road have off-street parking. Proposed LTS for this segment is reduced from LTS 4 to 1.

Cartway Width: 36'-43'

Speed Limit: 35mph

Cost Estimate

Mid-Term: \$86,200





Corsons Tavern Road (CR 628)

Location

Corsons Tavern Road links Upper Township/Dennis Township boundary in the south with U.S. Route 9. Corsons Tavern Road is a two-lane roadway with a speed limit of 50 mph.

Project Overview

The recommendations include converting shoulders to 5 foot bike lanes and reducing the speed limit to 35 mph as shown in cross section on the right. This speed limit reduction is based on a comparison to similar conditions (residential development patterns and roadway configurations) along Stagecoach Road (CR 667) for which a 35 mph speed limit is affirmed by municipal

Cartway Width: 34'-36'

Speed Limit: 50 mph

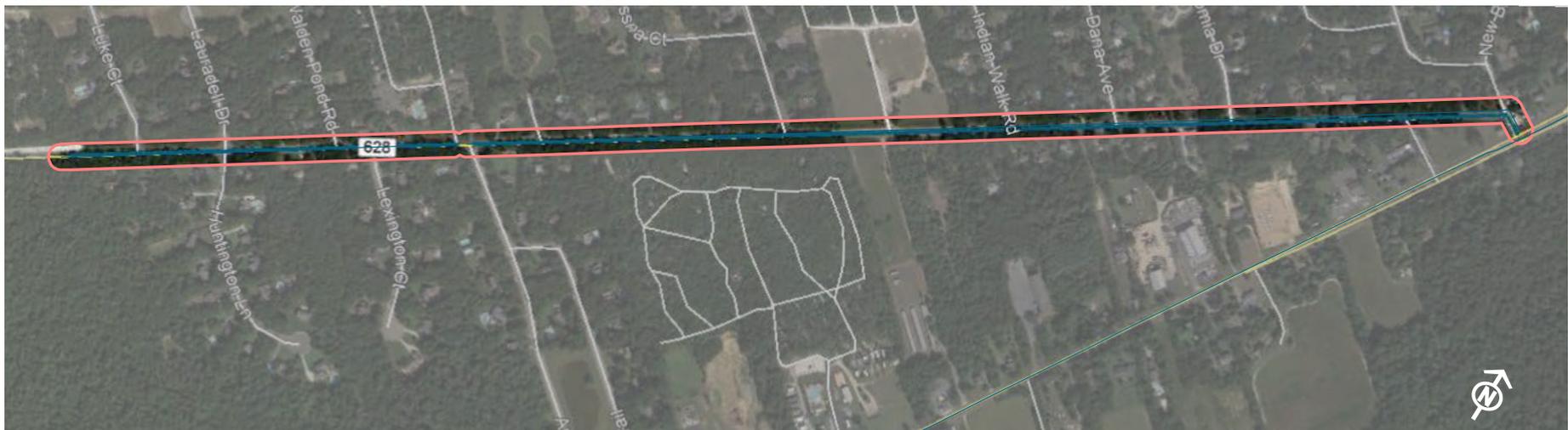
Cost Estimate

Mid-Term: \$21,400

Proposed



ordinance. Corsons Tavern Road is scheduled to be resurfaced in 2019, therefore the township should work with Cape May County to investigate modifications to proposed striping plans to include bicycle lanes. Proposed LTS for this segment reduced from LTS 4 to 3.





Narrows Road

Location

Narrows Road links CR 557 (Woodbine Road) and CR 664 (Mt. Pleasant-Tuckahoe Road). This is a two-lane roadway with a speed limit of 25 mph.

Project Overview

Narrows Road is not open to vehicles from CR 664 (Mt. Pleasant-Tuckahoe Road). Narrows Road is accessible from CR 557 to cars. For the section of the roadway with vehicular access shared lanes are recommended as shown in the aerial below. A two-way multi-use trail is recommended on the section closed to vehicles. Cross sections of both recommendations are on the right. LTS for this facility is 1.

Cartway Width: 16'-21'

Speed Limit: 25 mph

Cost Estimate

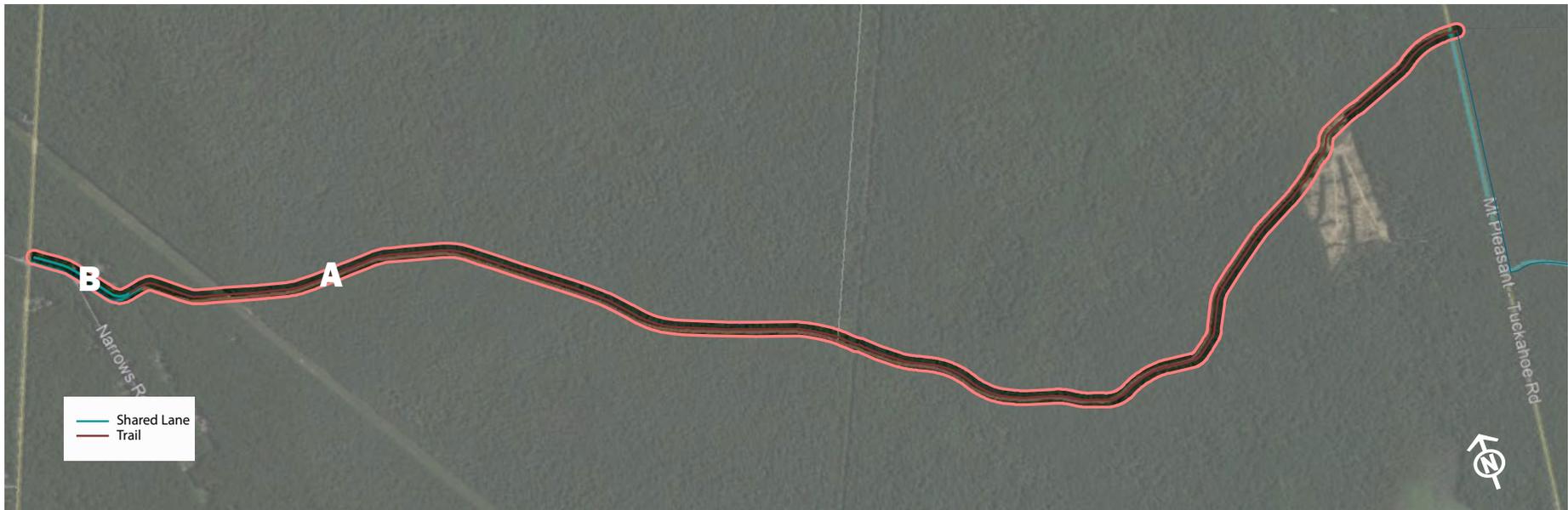
Short Term: \$2,700 (Shared-Lane)

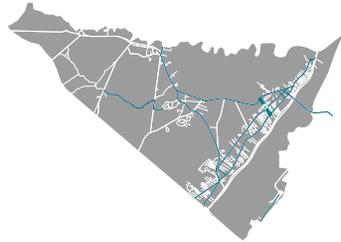
Mid-Term: \$40,500 (Multi-Use Path)

Proposed at Location A



Proposed at Location B





Church Road (CR 602)

Location

Church Road (CR 602) is an east-west roadway between U.S. Route 9 and Tuckahoe Road (CR 631).

Project Overview

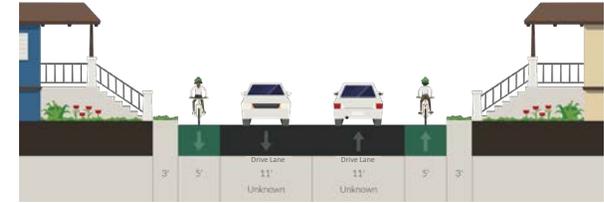
This is a two-lane roadway with a speed limit of 35 mph. The cartway width of the road varies between 32 and 34 feet with two 11 foot lanes and 5 or 6 foot shoulders adjacent to each travel lane. The recommendations include converting shoulders to 5 foot bike lanes and reducing the speed limit to 30 mph. Where possible, a painted buffer can be provided to offer increased separation between motor vehicles and cyclists.

Cartway Width: 35'-38'

Speed Limit: 35 mph

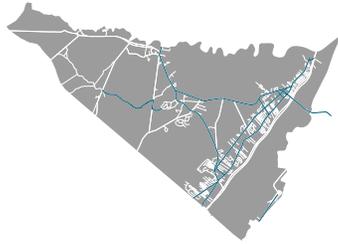
Cost Estimate

Mid-Term: \$13,800



A speed limit reduction is recommended largely due to the length of Church Road, residential density, as well as the potential to slow traffic approaching the intersection with Stagecoach Road. Prior to this conversion, a review of on-street parking needs should be advanced to confirm that all properties on Church Road have off-street parking. Proposed LTS for this segment reduced from LTS 4 to 2.





Woodbine Road (CR 557)

Location

Woodbine Road (CR 557) is a north-south connector between Woodbine and Upper Township. The bicycle route limits are from Narrows Road in Upper Township to the municipal boundary with Woodbine. This is a two-lane roadway with a speed limit of 50 mph. This roadway is ranked 5th in Cape May County as a high risk rural road for crash incidence.³

Project Overview

This is a two-lane roadway with a speed limit of 50 mph. The cartway width of the road is 36 feet with two 12 foot lanes and 6 foot shoulders adjacent to each travel lane. The recommendations include converting shoulders to 5 foot bike lanes with 2 foot buffers in each direction and reducing the travel lane width from 12 feet to 11 feet.



This recommendation also includes adding an enhanced crossing at Narrows Road/ Steelmantown Road. As the Township works with Cape May County to advance this concept, some consideration could be given to the long-term development of a multi-use sidepath, which would require an acquisition of right-of-way and a more substantial investment from project sponsors. Proposed LTS for this segment reduced from LTS 4 to 1.

Cartway Width: 36'

Speed Limit: 50 mph

Cost Estimate

Mid-Term: \$20,000



³ "High Risk Rural Road (HRRR) Hot Spot Lists, Cape May County," SJTPO, http://www.sjtpo.org/wp-content/uploads/2016/06/HRRR_CapeMay.pdf

Facility Type | Bicycle Boulevard

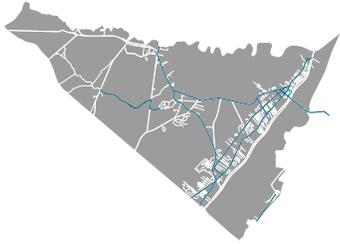
Bicycle boulevards are traffic calmed streets that prioritize bicycle travel and create a more comfortable bicycling environment. Many low speed, low volume residential streets provide the basic components of a bicycle boulevard. The preferred speed limit of a bicycle boulevard is 20 mph. Traffic calming elements appropriate for the context, such as curb extensions, speed cushions, chicanes, or mini-roundabouts, should be used to reinforce the low speed limit and discourage cut-through traffic. Pavement markings and wayfinding signage are also key elements, highlighting the corridor as a priority route for bicyclists and that the roadway is intended as a shared, slow street. Additional design details can be found in NACTO's *"Urban Bikeway Design Guide"*, and NJDOT's *"Complete Streets Design Guide"*.

Bicycle boulevards are recommended on the following roadways:

- Wistar Avenue
- Stanhope Road
- St. Martins Place
- Woods Road / Middletown Road / Mosquito Landing Road



Ocean City, NJ



Stanhope Rd, Wistar Avenue, St. Martins Place

Location

The roadway limits this route include Stanhope Road from Roosevelt Boulevard to Wistar Avenue, Wistar Avenue from Stanhope Road to North Shore Road, and Saint Martin's Place from North Shore Road to Old Tuckahoe Road. These are two-lane roadways with a speed limit of 25 mph.

Project Overview

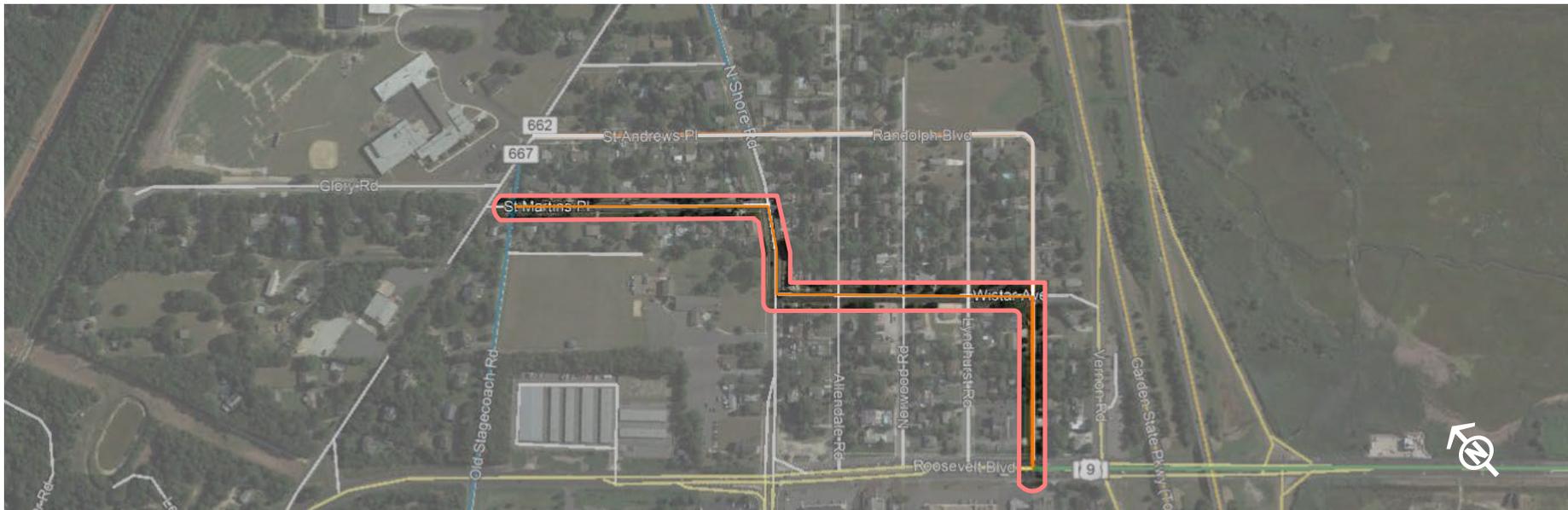
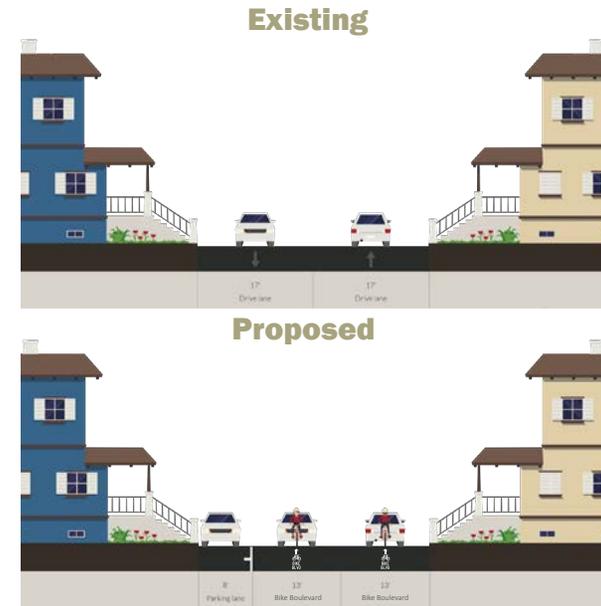
The cartway width of each roadway is 34 feet with two 11 foot lanes and on street parking. The recommendations include adding bicycle boulevard markings in each direction and designating parking as shown in the cross section on the right. LTS for these roadways is 1.

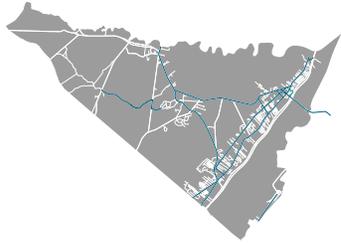
Cartway Width: 34'

Speed Limit: 25 mph

Cost Estimate

Short Term: \$5,700





Woods Rd/ Middletown Rd/ Mosquito Landing Rd

Location

Woods Road, Middletown Road and Mosquito Landing Road traverse the Tuckahoe/Corbin City Fish and Wildlife Management Area (WMA) and provide a parallel alternative (to NJ 50) bicycle connection to Tuckahoe Village from Petersburg Village. These roadways connect Tuckahoe Road (CR 631) to NJ 50 just south of the Tuckahoe River. This is a low speed and low traffic volume route that is used only for visitors to the WMA. These roadways are generally two-lane roadways of varying widths with a speed limit of 25 mph. The LTS for these roadways is 1.

Cartway Width: 5'-18'

Speed Limit: 25 mph

Cost Estimate:

Mid Term: \$33,400

Proposed



Project Overview

The cartway width of the three roadways varies between 15 and 18 feet. The recommendations include converting the roadways to bike boulevards with appropriate wayfinding signage.





Clockwise from top-left (1) Narrows Road closed for vehicular access (2) Amanda's Field (3) Bicyclists on Roosevelt Avenue Bridge (4) Bicyclists on Stage Coach Road



Facility Type | Two-Way Separated Bicycle Lanes

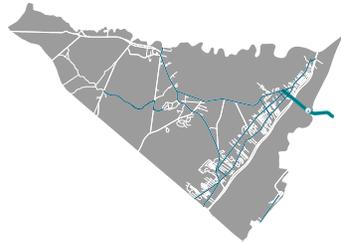
Two-way separated bicycle lanes are physically separated bicycle lanes that allow bicycle movement in both directions on one side of the road. Two-way separated bicycle lanes reduce the detour length for bicyclists by providing contra-flow movement and permitting more convenient and direct routes. Research indicates that two-way separated bicycle lanes are more attractive to bicyclists of all ages and abilities. The preferred width of two-way separated bicycle lanes is 12 feet. The minimum width permitted is 10 feet. The preferred and minimum width of the buffer with parking is 3 feet. The minimum width permitted without parking is 1.5 feet. Additional design details can be found in *NACTO's "Urban Bikeway Design Guide"*, and NJDOT's "Complete Streets Design Guide".

Two-way separated bicycle lanes are recommended on the following roadways:

- Roosevelt Boulevard (CR 623)
- Mt Pleasant Road (CR 664)
- North Shore Road



Source: NJDOT Complete Streets Design Guide



Roosevelt Boulevard (CR 623)

Location

This roadway is the only direct connection between Ocean City and Upper Township. This roadway runs east-west. Within Upper Township, the limits of Roosevelt Boulevard are Old Tuckahoe Road (CR 662) to the municipal boundary with Ocean City.

Project Overview

This is primarily a three-lane roadway with one lane in each direction and a center turn lane. This configuration changes to two lanes with one lane in each direction approaching the Roosevelt Boulevard Bridge to Ocean City. The cartway width of the road is 28' on the bridge and widens to 70' in the vicinity of the GSP and U.S. 9. The recommendations include adding a two-way bicycle lanes to the westbound side of the roadway as shown in the cross section on the right. The proposed improvement should be coordinated with any modifications to the bridge to make it compatible with bicycle and pedestrian traffic. Proposed LTS for this segment reduced from LTS 4 to 1.

Cartway Width: 28'-70'

Speed Limit: 40-45 mph

Cost Estimate:

Long Term: \$49,100

Proposed at Location A



Proposed at Location B





Mt Pleasant Road CR 664

Location

Mt Pleasant Road (CR 664) is a north-south roadway between Narrows Road and W Sunrise Road. This is a two-lane roadway with a speed limit of 50 mph.

Project Overview

This is a two-lane roadway with a speed limit of 50 mph. The cartway width of the road is 26 feet with 11-foot travel lanes and 2 foot shoulders adjacent to each travel lane. The recommendations include widening of the roadway by 9 feet for this section of the roadway. This additional width would provide adequate space to create a two-way separated bike lane linking proposed bicycle facilities on Narrows Road and W Sunrise Road. The proposed LTS for this segment would be reduced from LTS 4 to 1.

Cartway Width: 26'

Speed Limit: 50 mph

Cost Estimate

Mid-Term: \$18,500

Proposed





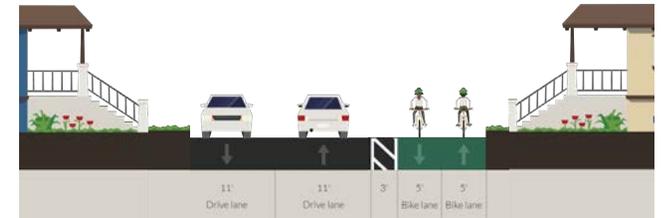
North Shore Road

Location

The limits of this segment are from Wistar Avenue to Saint Martins Place. The speed limit on the roadway is 40 mph.

Project Overview

North Shore Road a two-lane roadway with a posted speed limit of 40 mph. The cartway width of this segment is approximately 50 feet with two 11 foot lanes and an approximately 17 foot shoulder adjacent to the northbound travel lane. The recommendations for this segment include converting the northbound shoulder to provide a two-way separated bicycle lane and reducing the speed limit to 30 mph as shown in cross section on the right. Further, as noted above, North Shore Road should be reclassified from an Urban Minor Arterial roadway to



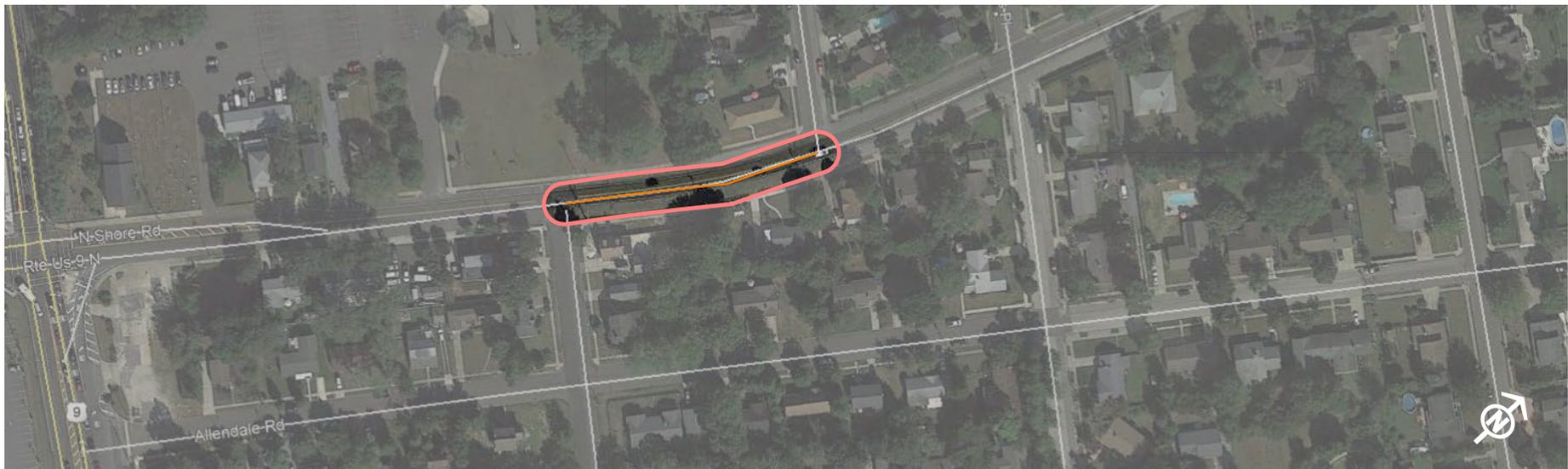
a Rural Minor Connector, given the substantial change in typical use with the closure of the Beesley's Point Bridge. Upper Township should work with NJDOT to identify opportunities to modify proposed striping plans currently being developed to modify the current layout to accommodate bike lanes. Proposed LTS for this segment is reduced from LTS 4 to 1.

Cartway Width: 36'-43'

Speed Limit: 40 mph

Cost Estimate

Mid-Term: \$3,300



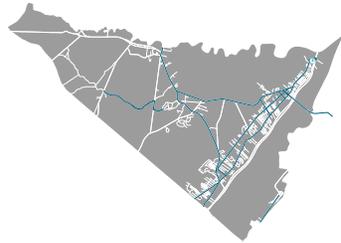
Facility Type | Shared-Lane Marking

To complete the bicycle network and provide vital connections to major destinations in the study area, shared-lane markings are proposed on roadways with cartway width limitations. While shared-lane markings alone do not reduce bicycle level of traffic stress, the markings help increase motorist awareness of bicyclists on the roadway, assert the legitimacy of bicyclists on the roadway, help bicyclists properly position themselves in the lane, and provide directional and wayfinding guidance. Additional design details can be found in NACTO's "Urban Bikeway Design Guide", and NJDOT's "Complete Streets Design Guide".

Shared lanes are recommended on the following roadways:

- Harbor Road
- Commonwealth Avenue (CR 619)





Harbor Road

Location

Harbor Road is in the northern most portion of Upper Township. It is a dead-end street surrounded by residential, commercial and recreational (beach) land uses. Harbor Road extends from North Shore Road to approximately 0.4 miles east of the Garden State Parkway.

Project Overview

Harbor Road is a two-lane roadway with a cartway width of 21 feet with two 10.5 foot lanes and no shoulders. The recommendations include adding shared lane markings on the roadway. This is a low speed and low volume facility, so, a shared lane facility is feasible on this roadway. The recommendations are illustrated in the cross section on the right.

Cartway Width: 21'

Speed Limit: 25mph (not posted)

Cost Estimate

Short Term: \$3,200



Long Term:

A longer term proposal for Harbor Road includes the creation of a sidepath on the westbound side of Harbor Road. This sidepath would provide a direct link between the multi-use path on the Great Egg Harbor Bridge and connect to the proposed bike lanes on North Shore Road. For this concept Upper Township would have to work with Tuckahoe Inn as some portion of the sidepath would lie on their property.





Commonwealth Avenue (CR 619)

Location

The roadway limits of CR 619 are from Second Street to Williard Avenue/Bay Avenue. This is a two-lane roadway with a speed limit of 35 mph.

Project Overview

The cartway width of CR 619 is 36 feet with two 11 foot lanes and 7 foot shoulders adjacent to each travel lane. The recommendations include adding shared lane markings and reducing the speed limit to 25 mph as shown in the cross section on the right. Proposed LTS for this segment reduced from LTS 4 to 2.

During the completion of this Plan, Upper Township and Cape May County initiated discussion of alternatives to improve conditions for cyclists along this corridor, in addition to upgrades to existing crosswalks within Strathmere.

Cartway Width: 36'

Speed Limit: 35 mph

Cost Estimate

Short Term: \$16,100

Existing



Proposed



Bicycle Parking

Bicycle parking facilities are needed to extend bicycle use from an opportunity for recreation to a feasible mode of transportation. Bicycle parking in Upper Township is needed near the schools, camp grounds, the beach, lake, parks, and other commercial areas. Most of the racks in Upper Township are “comb” style racks, an older design standard.

Providing adequate, secure bicycle parking is an important measure to accommodate and encourage cycling as an alternative travel mode. Proper parking facilities increase the convenience of cycling for commuting, utilitarian, or recreational purposes while also alleviating the threat of theft. Parking should be conveniently located, well lit, and easily visible for cyclists arriving at a destination. There are a variety of bicycle parking racks available. Based on guidelines from the Association of Pedestrian and Bicycle Professionals (APBP), a bicycle rack should meet the following requirements:

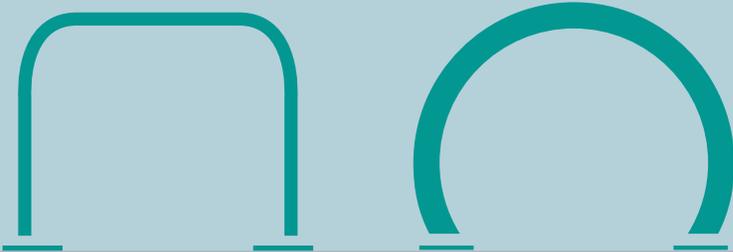
- Be intuitive to use
- Support the bicycle upright by its frame in two locations
- Prevent the wheel of the bicycle from tipping over
- Enable the frame and one or both wheels to be secured
- Support bicycles without a diamond shaped frame and horizontal top tube (e.g. step through frames)
- Allow both front-in and back-in parking with a U-lock through the frame and front or rear wheel
- Resist the cutting or detaching of any rack element with hand tools

Older style racks, such as the “comb”/“schoolyard,” “toast,” and “wave” are not recommended because they do not properly support the bicycle frame, generally do not facilitate locking of the frame to the rack, and frequently cause interference between the handlebars of adjacent bikes when the rack is near capacity. Recommended racks include the “inverted U,” “A,” and “post and loop.” These rack types are illustrated in Figure on the next page. Bike racks should also be properly spaced to allow easy, independent access to each bike.



Recommended Bike Rack Designs

Preferred Design



Inverted U

Common style appropriate for many uses; two points of ground contact. Can be installed in series on rails to create a free-standing parking area in variable quantities. Available in many variations.

Other Acceptable Designs



Post and Ring

Common style appropriate for many uses; one point of ground contact. Compared to inverted-U racks, these are less prone to unintended perpendicular parking. Products exist for converting unused parking meter posts.



Wheelwell Secure

Includes an element that cradles one wheel. Design and performance vary by manufacturer; typically contains bikes well, which is desirable for long-term parking and in large-scale installations (e.g. campus); accommodates fewer bicycle types and attachments than the two styles above.



Racks to Avoid

Wave

Not intuitive or user-friendly; real-world use of this style often falls short of expectations; supports bike frame at only one location when used as intended.



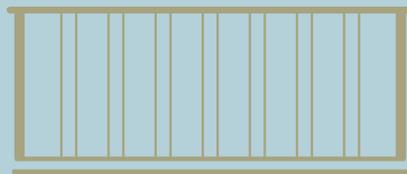
Wheelwell

Racks that cradle bicycles with only a wheelwell do not provide suitable security, pose a tripping hazard, and can lead to wheel damage.



Schoolyard (comb)

Does not allow locking of frame and can lead to wheel damage. Inappropriate for most public uses, but useful for temporary attended bike storage at events and in locations with no theft concerns.



Coathanger

This style has a top bar that limits the types of bikes it can accommodate.



Spiral

Despite possible aesthetic appeal, spiral racks have functional downsides related to access, real-world use, and the need to lift a wheel to park.



Bollard

This style typically does not appropriately support a bike's frame at two separate locations, which limits its framelock capability and bicycle stability.



Images and descriptions courtesy of APBP *Essentials of Bicycle Parking*

Trails

As discussed in the Existing Conditions chapter, Upper Township's existing trail network is a valuable and unique resource within the Township. Improving connections between the trails and to new bike facilities will be an important step forward in creating a more complete network. Many of the proposed connections take advantage of existing right-of-way (ROW) locations throughout the township. New trail opportunities are substantially constrained by existing environmental features, particularly wetlands, that comprise a substantial portion of the township. While new trail opportunities within these areas may be feasible, they will require the township to work with Cape May County and relevant environmental jurisdictions to identify potential funding opportunities to cover the substantial planning, permitting, design, and construction costs.

Improved Connectivity

There are several proposed bicycle facility improvements which will enhance connectivity between trails and parks (shown in Map 01 on page 13). These improvements consist of dedicated bike lanes, shared-lane markings, and multi-use paths. The proposed bike facilities would improve access to a number of trails and parks by providing lower stress routes. There are five multi-use paths proposed in Upper Township, utilizing existing rail or utility right of ways. The proposed multi-use paths are shown in figures on the next page.

1. Multi-use path and shared lane markings on Narrows Road, would provide connections to the Amanda's Field as well as Petersburg village
2. This utility ROW converted to a multi-use path can connect bicyclists to Amanda's field, as well as to bike lane on CR 631 connecting to Beesley's Point and Marmora

3. This utility ROW converted to a multi-use path can connect to Dennis Township and Seaville
4. This utility ROW converted to a multi-use path can provide an alternative to North Shore Road
5. This rail ROW converted to a multi-use path can provide access to scenic views of wetlands and water and can be a tourist destination. Upper Township had previously been awarded a grant to convert this rail ROW to a mixed-use trail, but the conversion was not supported by NJ Transit. Upper Township should revisit discussions with NJ Transit to identify future potential trail uses of this corridor.

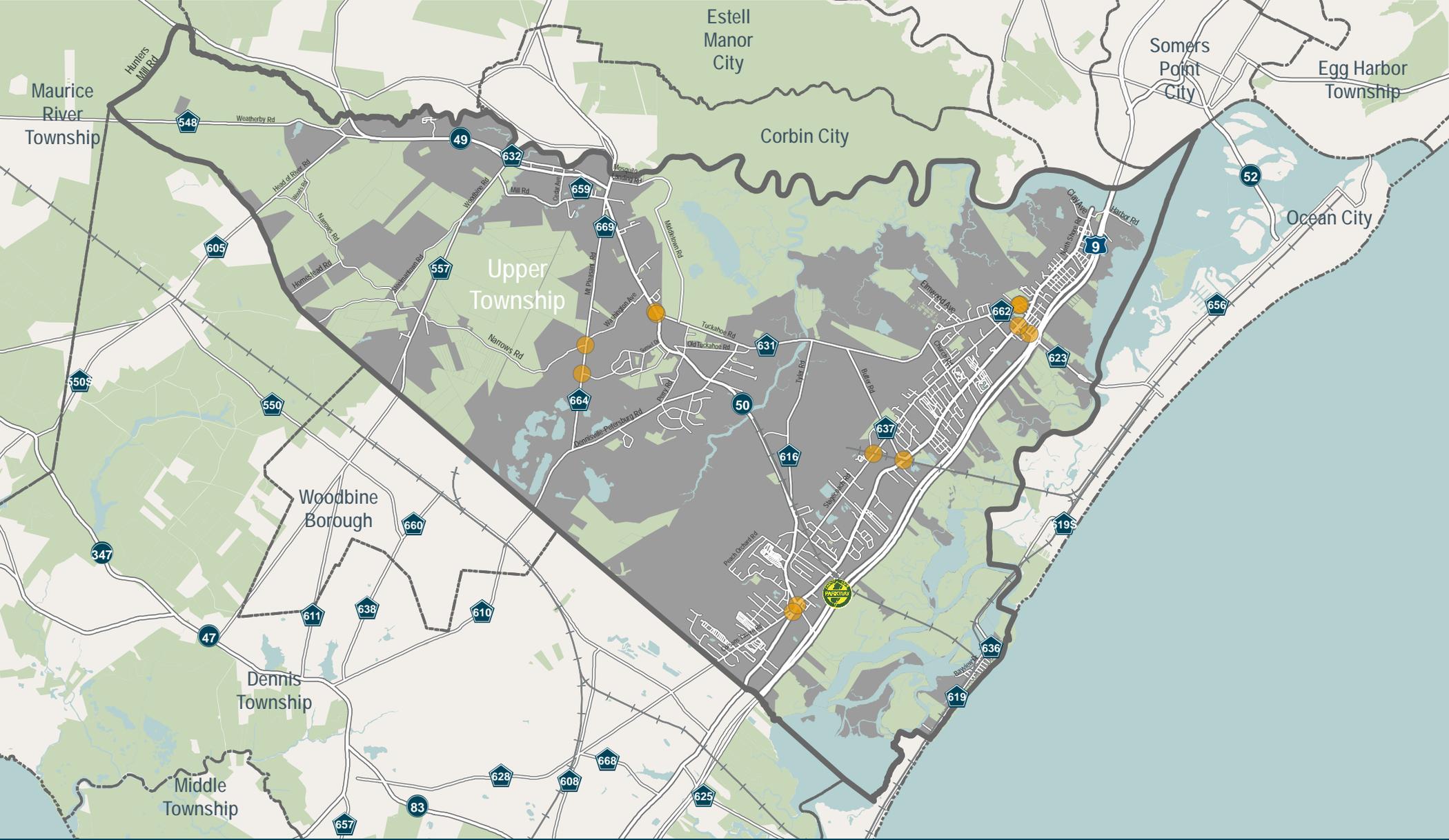
Additionally, the Beesley's Point Secondary rail line may provide an additional potential trail route, connecting Tuckahoe village with Beesley's Point. This rail line is currently active, serving the B.L. England (Beesley's Point) Generating Station. The Township should work together with NJDOT and Cape May County to ensure that future trail opportunities along this corridor mesh with any operational changes at the plant.



Enhanced Crossings

Several crossings on proposed on-road bicycle routes will require additional consideration for improvements to provide adequate crossing opportunities. This is especially evident on Stagecoach Road, where crossings of Roosevelt Boulevard (CR 623) and Church Road (CR 602) were identified by local residents as particularly challenging. For these locations, as well as others identified in Map 10, improved signage, including actuated RRFB or advance flashing signage should be considered.

For locations where proposed trail facilities require on-street crossings, enhancements can be made to improve the visibility of trail users crossing the roadway to motorists. Trail crossing treatments include; the addition of high visibility continental crosswalk striping, repainted crossing marking, the addition of an in-street stop for pedestrian sign, and the use of MUTCD W11-15 signage with RRFB to better alert drivers to the upcoming crossing. The locations of enhanced crossings for Upper Township are highlighted in Map 9 on Page 55.



Bicycle Conditions Analysis for Upper Township

Map 10 - Enhanced Crossings

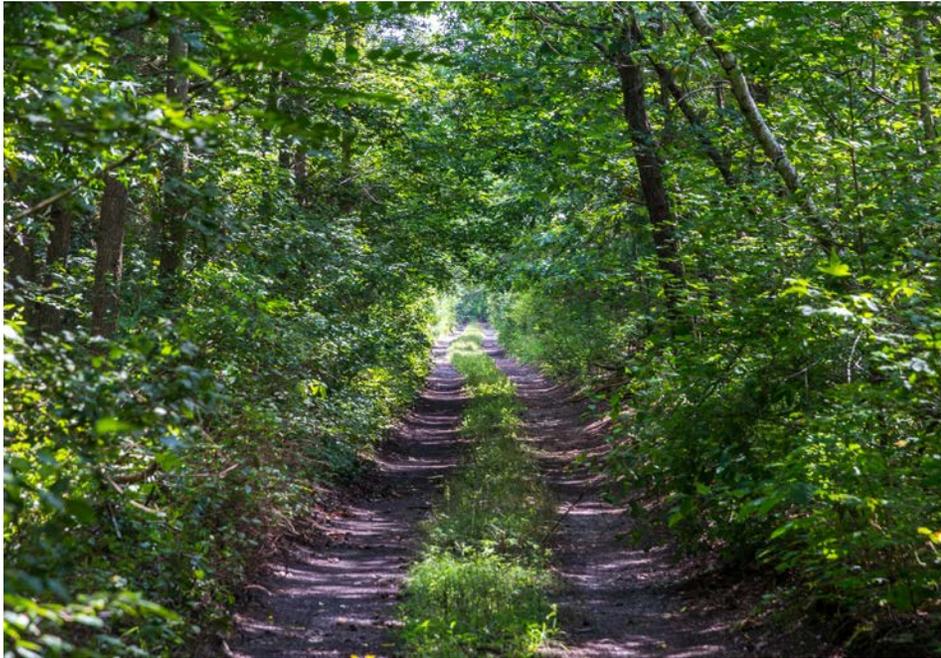
- Enhanced Crossing
- Open Space and Parks



Regional Connections

While the plan focuses on routes and improvements within Upper Township, connections to regional bicycle routes are important as well. The table below identifies potential connections to adjacent municipalities, connections to existing bicycle routes, and potential constraints to improvements just beyond the boundaries of Upper Township.

Direction	Municipality	Route	Existing Bicycle Routes	Constraints
North	Corbin City	NJ 50	Proposed route in this plan	Tuckahoe River Bridge - Narrow cartway , High traffic volumes and travel speeds
North	Somers Point City	GSP	Great Egg Harbor Bridge	North Shore Road improvements as detailed in this Plan
North	Ocean City	CR 619	Proposed route in this plan	Corson's Inlet Bridge - Narrow cartway width and steel deck
North	Estell Manor City	NJ 49		Rural context, few generators/destinations - Opportunities for connections are limited.
South	Dennis Township	CR 628	Proposed route in this plan	Higher travel speeds and rural context of CR 628 in Dennis Township
South	Dennis Township	via AC Electric ROW	Proposed route in this plan	Route contingent on cooperation between Township/ County/AC Electric
South	Woodbine Township	CR 557	Woodbine Railroad Trail	CR 557 requires improvements/upgrades
South	Sea Isle City	CR 619	Proposed route in this plan	
South	Dennis Township	CR 605		Higher travel speeds and rural context of CR 619 between Strathmere and Sea Isle City
South	Dennis Township	US Route 9		Rural context, few generators/destinations - Opportunities for connections are limited.
South	Dennis Township	CR 610		High traffic volumes and travel speeds - Opportunities for connections are limited.
East	Ocean City	CR 623	Proposed route in this plan	Roosevelt Boulevard Bridge - Narrow cartway width
West	Maurice River Township	CR 548		Rural context, limited shoulders, high vehicular travel speeds - Opportunities for connections are limited.



Clockwise from top-left (1) Rail ROW (#3) (2) New multi-use path on US 9/GSP (3) Rail ROW #3 under GSP (4) Narrows road looking towards Mt. Pleasant-Tuckahoe Rd (CR 664)



LTS and summary

The proposed improvements described in the previous section are intended to provide a more comfortable, convenient, and interconnected bicycle network for cyclists of all ages and abilities. Improving the bicycle facilities for the roadways mentioned in the previous section will create a comprehensive bicycle network for Upper Township. As shown in the Map 9 on Page 55, the proposed network builds upon existing bicycle facilities, connects major destinations for residents and tourists, and improves linkages between Upper Township and surrounding municipalities.

Re-evaluating the bicycle level of traffic stress (LTS) for the proposed network is one way to measure the anticipated benefits to user comfort. Map 11 on the next page shows the revised LTS analysis with all the recommended bicycle improvements implemented. The result is a network that has significantly reduced bicycle level of stress on roadways with proposed bicycle facilities. The facilities with reduced LTS are shown in the table on the right and in the Map 11 on the next page. The level of traffic stress metric measures the comfort level of a roadway for different types of users. By focusing on providing connections that are either LTS 1 or 2, the network better accommodates current cyclists and is more attractive to potential new bicyclists. Most importantly, it increases the livability of the communities by prioritizing and accommodating an active, healthy, and fun transportation mode for residents and tourists alike.

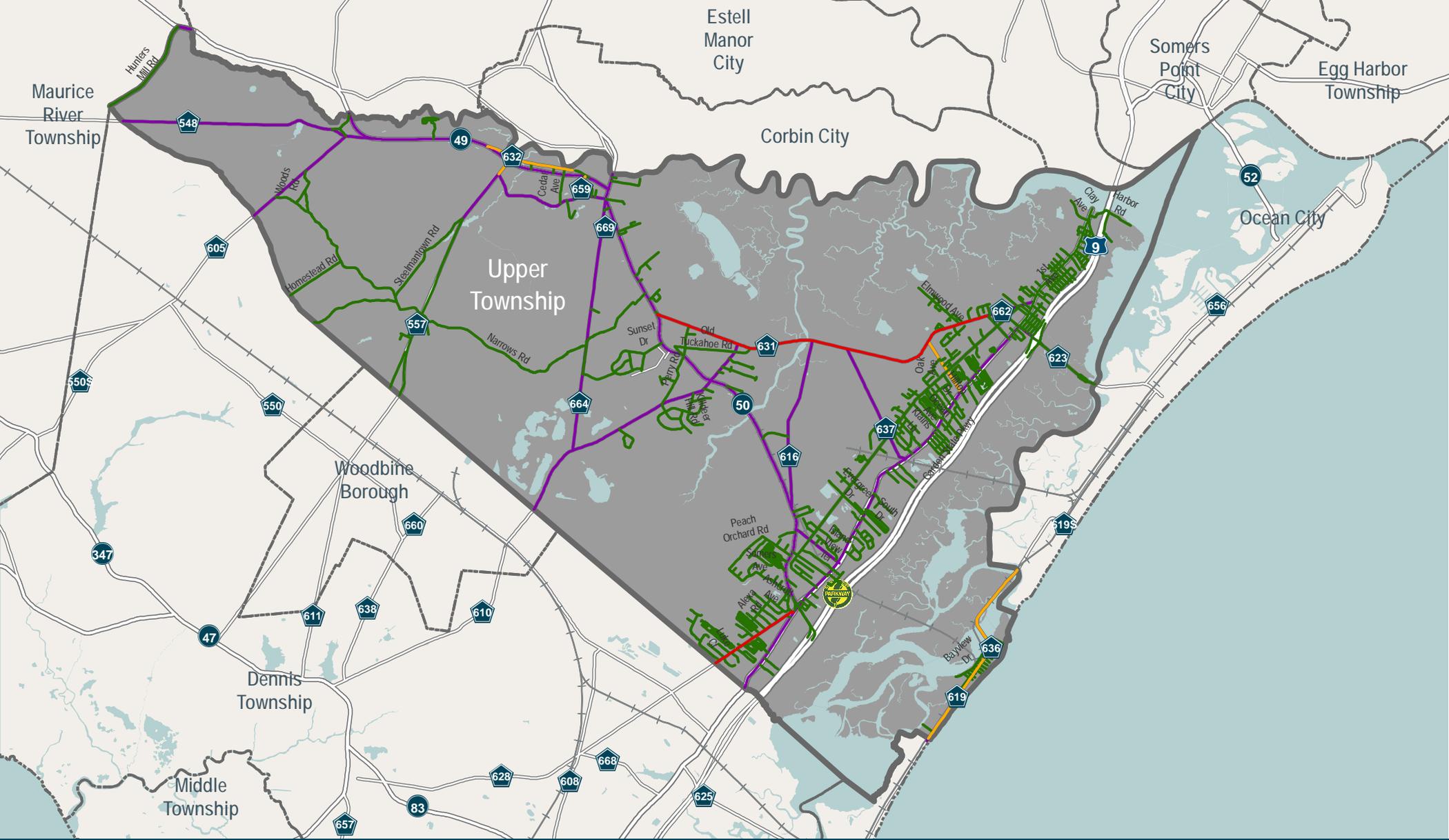
Remaining Gaps

While the Plan has an ultimate goal of achieving a township-wide network of improved links for cyclists, two notable gaps remain, each of which should be advanced separately for additional study.

Roadway	LTS Existing	LTS Proposed
North Shore Rd	4	1
Church Rd (CR 602)	4	2
Commonwealth Ave (CR 619)	4	2
Roosevelt Blvd (CR 623)	4	1
Corsons Tavern Rd (CR 628)	4	3
Tuckahoe Rd (CR 631)	4	3
Stagecoach Rd (CR 667)	4	1
Woodbine Rd (557)	4	1

Roosevelt Boulevard Bridge (CR 623) – The plan proposes a two-way cycle track along Roosevelt Boulevard between the existing bridge and Stanhope Road. Such a treatment should not be advanced until appropriate measures are taken to improve the existing narrow bridge, which currently has no accommodations for cyclists or pedestrians.

US Route 9 – A short gap remains between proposed improvements on Stagecoach Road (CR 667) and Corson’s Tavern Road (CR 628). This half-mile segment includes the intersection of US Route 9 with NJ Route 50, one of the most heavily traveled locations in the township. On-road bicycle routes are not appropriate on this segment of US Route 9 given travel volumes and speeds, as well as the current configuration of the intersection at NJ Route 50.



Map 11 - Proposed Bicycle Level of Traffic Stress

Bicycle Conditions Analysis for Upper Township

LTS

- Level of Stress 1
- Level of Stress 2
- Level of Stress 3
- Level of Stress 4
- LTS Change from Existing



Speed vs. Safety

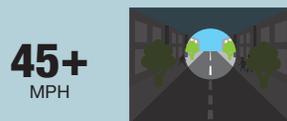
HIT BY A VEHICLE TRAVELING AT...



STOPPING DISTANCE FOR A VEHICLE TRAVELING AT...



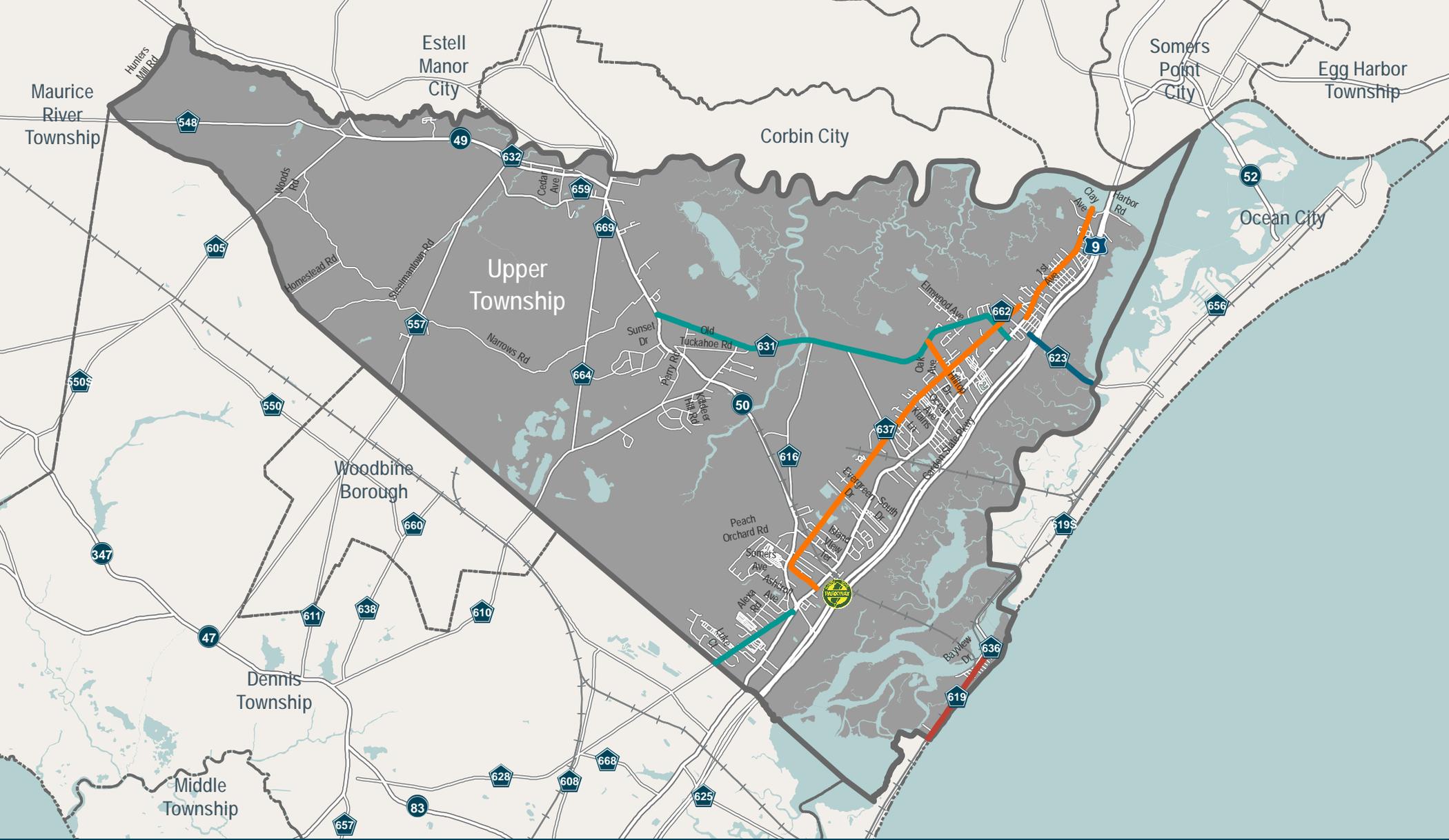
VISIBILITY TRAVELING AT...



Speed Limit Change

Vehicle speed is a critical determinant in crash severity, as illustrated in the sidebar to the left. Several roadways in Upper Township where bicycle facilities are proposed also include proposed reduction in speed limits. In many cases these speed limit changes align with a proposed change in roadway classification based on a review of current roadway use and context. Map 12 on the next page illustrates the roadways with speed limit changes. The table below lists the facilities and speed limit changes.

Roadway	Existing Speed Limit	Proposed Speed Limit	Proposed Bike Facility Type
North Shore Rd	40	30	Bike Lanes
Church Rd (CR 602)	35	30	Bike Lanes
Commonwealth Ave (CR 619)	35	25	Shared Lanes
Roosevelt Blvd (CR 623)	45	40	Two-Way Separated Bike Lanes
Corsons Tavern Rd (CR 628)	50	35	Bike Lanes
Tuckahoe Rd (CR 631)	50	40	Bike Lanes
Stagecoach Rd (CR 667)	35	30	Bike Lanes



Map 12 - Proposed Speed Limit Changes

**Bicycle Conditions
Analysis for
Upper Township**

Proposed Speed Limit

- 25
- 30
- 35
- 40





07 NEXT STEPS

The recommendations in this report provide a roadmap for improving conditions for biking in Upper Township.

The proposed recommendations outline a range of engineering, education, enforcement, and encouragement concepts and strategies to enhance bicycle mobility throughout the two communities. Prioritized and implemented overtime, as funding is available, they will foster higher levels of biking activity, spur economic activity along the commercial corridors, support tourism, and create a more robust network linking residents and tourists with the places they want to go.

Upper Township should work with Cape May County, the South Jersey Transportation Planning Organization (SJTPO), and New Jersey Department of Transportation (NJDOT) to advance the proposed improvements. A variety of funding sources are available to support local bicycle and pedestrian

improvements and programs. The New Jersey Bicycle and Pedestrian Resource Center has compiled a summary of funding resources which can be found here: <http://njbikeped.org/funding-2/>. Further guidance on designing of bicycle facilities can be found in the New Jersey Complete Streets Design Guide here: <http://njbikeped.org/wp-content/uploads/2017/05/Complete-Streets-Design-Guide.pdf>.





08 APPENDIX A
**Bicycle Level of Traffic
Stress (LTS)**
Analysis Criteria

Criteria for Level of Stress in Mixed Traffic

Posted Speed Limit	Street Width		
	2-3 Lanes	4-5 Lanes	6+
Up to 25 mph	LOS 1 or 2	LOS 3	LOS 4
30 mph	LOS 2 or 3	LOS 4	LOS 4
35 + mph	LOS 4	LOS 4	LOS 4

Level of Stress for Mixed Traffic in the Presence of a Right Turn Lane

Configuration	Level of Stress
Up to 25 mph Single right-turn lane with length \leq 75 ft. and intersection angle and curb radius limit turning speed to 15 mph	(no effect on LOS)
Single right-turn lane with length between 75 and 150 ft., and intersection angle and curb radius limit turning speed to 15 mph	LOS \geq 3
Otherwise	LOS = 4

Level of Stress for Unsignalized Crossings Without a Median Refuge

Speed Limit of Street Being Crossed	Width of Street Being Crossed		
	2-3 Lanes	4-5 Lanes	6+
Up to 25 mph	LOS 1	LOS 2	LOS 4
30 mph	LOS 1	LOS 2	LOS 4
35 + mph	LOS 2	LOS 3	LOS 4
40 + mph	LOS 3	LOS 4	LOS 4

Source: *Low-Stress Bicycling and Network Connectivity*, Mineta Transportation Institute, 2012

Criteria for Bike Lanes Alongside a Parking Lane

	LTS ≥ 1	LTS ≥ 2	LTS ≥ 3	LTS ≥ 4
Street width (through lanes per direction)	2	(no effect)	4 or more	(no effect)
Sum of bike lane and parking lane width (includes marked buffer and paved gutter)	15 ft. or more	14 ft.	13.5 ft or less	(no effect)
Speed limit or prevailing speed	25 mph or less	30 mph	35 mph	40 mph or more
Bike lane blockage (typically applies in commercial areas)	rare	(no effect)	frequent	(no effect)

Note: (no effect) = factor does not trigger an increase to this level of traffic stress

Criteria for Bike Lanes Not Alongside a Parking Lane

	LTS ≥ 1	LTS ≥ 2	LTS ≥ 3	LTS ≥ 4
Street width (through lanes per direction)	2	4, if directions are separated by a raised median	5, or 4 without a separating median	(no effect)
Bike lane width (includes marked buffer and paved gutter)	6 ft. or more	5.5 ft. or less	(no effect)	(no effect)
Speed limit or prevailing speed	30 mph or less	(no effect)	35 mph	40 mph or more
Bike lane blockage may apply in commercial areas)	rare	(no effect)	frequent	(no effect)

Note: (no effect) = factor does not trigger an increase to this level of traffic stress

Source: *Low-Stress Bicycling and Network Connectivity*, Mineta Transportation Institute, 2012

Volume Adjustment

Volume Threshold	Min. LTS
-	1
5,000	2
10,000	3
15,000	4



Petersburg
Fields
←

SPEED
LIMIT
10

SEE
TRAFFIC
SIGNALS

05 APPENDIX B

Implementation Matrix

Location	Type of Improvement	Category	Improvement	Approximate Material Cost	Implementation Term	Lead Agency	Supporting Agency
US 9 and Roosevelt Blvd	Pedestrian	Intersection Spot Improvement	Continental Crosswalks (four)	\$4,700.00	Short-Term	NJDOT	Cape May County / Upper Twp
			Sidewalk	\$24,600.00	Long-Term		
			ADA compliant ramp (three)	\$2,100.00	Short-Term		
NJ 50 and US 9	Pedestrian	Intersection Spot Improvement	Continental Crosswalks (four)	\$5,400.00	Short-Term	NJDOT	Cape May County / Upper Twp
			Sidewalk	\$19,900.00	Long-Term		
			ADA compliant ramp (ten)	\$7,000.00	Short-Term		
			Pedestrian Refuge Island (two)	\$52,500.00	Long-Term		
North Shore Rd	Bicycle	Corridor	Install Two-Way cycle track from Wistar Ave to St Martins PI	\$3,300.00	Mid-Term	NJDOT	Upper Township
Woodbine Rd	Bicycle	Corridor	Install bike lane from Narrows Rd to Upper Twp and Woodbine municipal boundary	\$20,000.00	Mid-Term	Cape May County	NJDOT/Upper Township
Mosquito Landing Rd/Middletown Rd/Woods Rd	Bicycle	Corridor	Install bicycle boulevard from Tuckahoe Rd to NJ 50	\$33,400.00	Mid-Term	Upper Twp	NJDOT
Stanhope Rd	Bicycle	Corridor	Install Bike Blvd from Roosevelt Blvd to Wistar Ave	\$1,900.00	Short-Term	Upper Twp	NJDOT
Wistar Ave	Bicycle	Corridor	Install Bike Blvd from Stanhope Rd to N Shore Rd	\$1,900.00	Short-Term	Upper Twp	NJDOT
St Martins PI	Bicycle	Corridor	Install Bike Blvd from N Shore Rd to Stagecoach Rd	\$1,900.00	Short-Term	Upper Twp	NJDOT
Corsons Tavern Rd (CR 628)	Bicycle	Corridor	Install Bike Lane from US 9 to Luke Ct	\$21,400.00	Mid-Term	Cape May County	NJDOT/Upper Township
North Shore Rd	Bicycle	Corridor	Install Bike Lane from Randolph Blvd to Upper Twp Boundary	\$28,300.00	Mid-Term	Upper Township	Cape May County / NJDOT
Stagecoach Rd (CR 667)	Bicycle	Corridor	Install Bike Lane from US 9 to Roosevelt Blvd (CR 623)	\$86,200.00	Mid-Term	Cape May County	NJDOT/Upper Township
Tuckahoe Rd (CR 631)	Bicycle	Corridor	Install Bike Lane from US 9 to NJ 50	\$87,500.00	Mid-Term	Cape May County	NJDOT/Upper Township
Church Rd (CR 602)	Bicycle	Corridor	Install Bike Lane from Tuckahoe Rd to US 9	\$13,800.00	Mid-Term	Cape May County	NJDOT/Upper Township

Location	Type of Improvement	Category	Improvement	Approximate Material Cost	Implementation Term	Lead Agency	Supporting Agency
Narrows Rd	Bicycle	Corridor	Install Multi-Use Path from Narrows Rd to Mt. Pleasant-Tuckahoe Rd	\$40,500.00	Mid-Term	Upper Township	Cape May County / NJDOT
Rail ROW North Shore Rd	Bicycle	Corridor	Install Multi-Use Path from Hudson Ave to Wilkie Blvd	\$43,900.00	Long-Term	Upper Township	Cape May County / NJDOT
Rail ROW Stagecoach Rd	Bicycle	Corridor	Install Multi-Use Path from Stagecoach Rd (CR 667) to Garden State Pkwy	\$16,000.00	Long-Term	Upper Township	Cape May County / NJDOT
Utility Easement #7	Bicycle	Corridor	Install Multi-Use Path from NJ 50 to S Sunset Dr	\$418,900.00	Long-Term	Upper Township	Cape May County / NJDOT
ROW 1	Bicycle	Corridor	Install Multi-Use Path from Dennisville-Petersburg Rd (CR 610) to Woodbine Ocean View Rd (CR 550)	\$1,293,100.00	Long-Term	Upper Township	Cape May County / NJDOT
ROW 2	Bicycle	Corridor	Install Multi-Use Path from ROW 1 to S Sunset Dr	\$299,400.00	Long-Term	Upper Township	Cape May County / NJDOT
Commonwealth Ave (CR 619)	Bicycle	Corridor	Install Shared Lane Markings from Taylor Ave to Williard Ave	\$16,100.00	Short-Term	Cape May County	NJDOT/Upper Township
Harbor Rd	Bicycle	Corridor	Install Shared Lane Markings from N Shore Rd to Cove Rd	\$3,200.00	Short-Term	Upper Township	Cape May County / NJDOT
Mt.Pleasant Tuckahoe Road (CR 664)	Bicycle	Corridor	Install Two-Way cycle track from Narrows Rd to W Sunrise Rd	\$18,500.00	Long-Term	Cape May County	NJDOT/Upper Township
Narrows Rd	Bicycle	Corridor	Install Shared Lane Markings from Woodbine Rd (CR 557) to Narrows Rd	\$2,700.00	Short-Term	Upper Township	Cape May County / NJDOT
NJ 50	Bicycle	Corridor	Install Shared Lane Markings from Narrows Rd to Tuckahoe Rd (CR 631)	\$700.00	Short-Term	Upper Township	Cape May County / NJDOT
S Sunset Dr	Bicycle	Corridor	Install Shared Lane Markings from California Rd to W Sunrise Rd	\$4,900.00	Short-Term	Upper Township	Cape May County / NJDOT
W Sunrise Rd	Bicycle	Corridor	Install Shared Lane Markings from S Sunset Dr to Mt. Pleasant-Tuckahoe Rd (CR 664)	\$5,700.00	Short-Term	Upper Township	Cape May County / NJDOT
Roosevelt Blvd (CR 623)	Bicycle	Corridor	Install Two-Way Cycle Track from Randolph Blvd to Upper Twp boundary	\$49,100.00	Long-Term	Cape May County	NJDOT/Upper Township

Upper Township Bicycle Plan 2018

