






SOUTH CENTRAL REGIONAL BICYCLE AND PEDESTRIAN PLAN UPDATE

Submitted for:

SCRCOG
South Central Region Council of Governments

Submitted by:

FITZGERALD & HALLIDAY, INC.
Innovative Planning, Better Communities

FINAL

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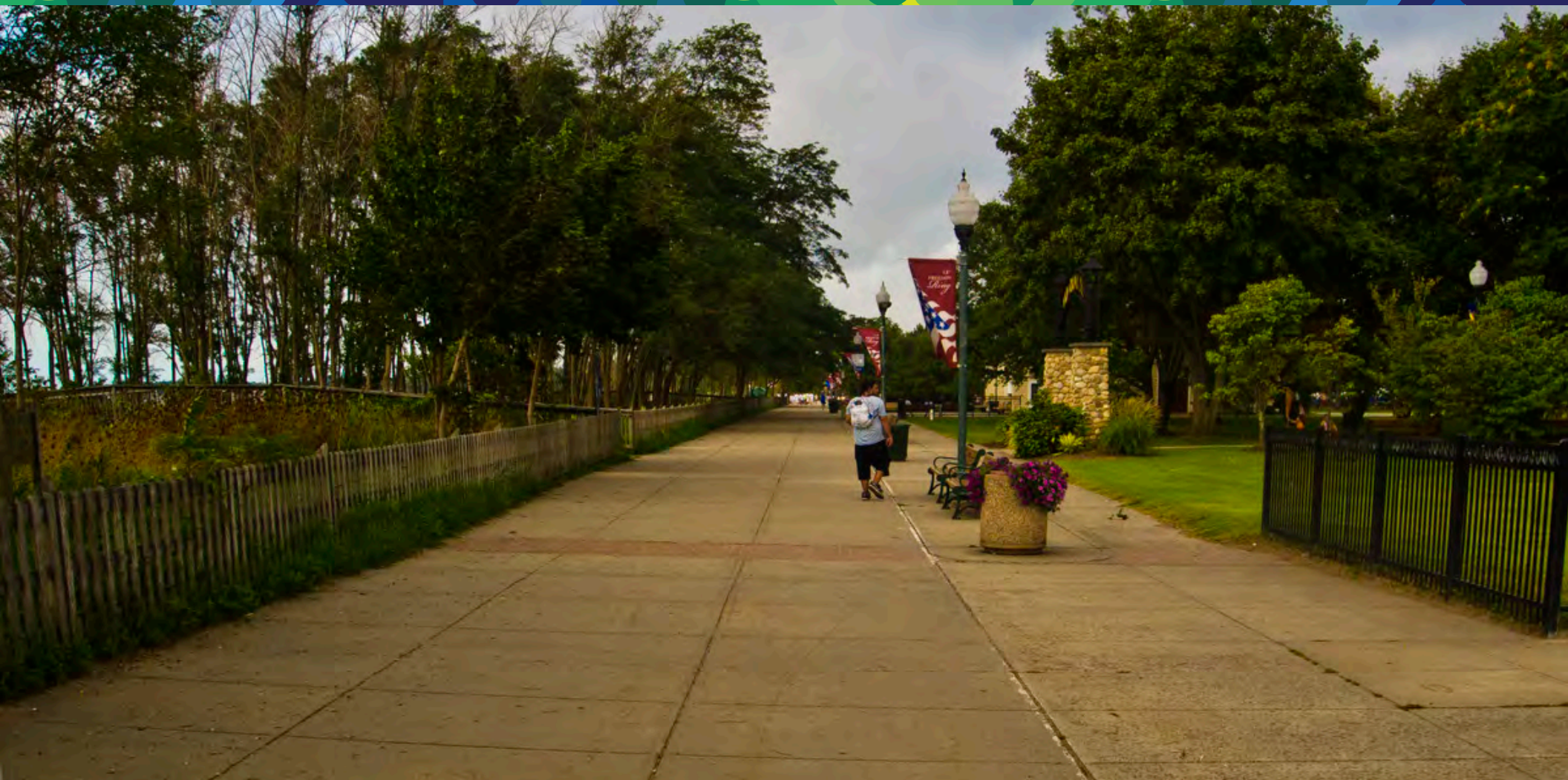
Chapter 1
EXECUTIVE SUMMARY



Chapter II introduces the *South Central Regional Bicycle & Pedestrian Plan Update (Regional Plan Update)*. It describes the importance of bicycling and walking as modes of active, or human-powered, transportation. Some of the valuable benefits of active transportation and its associated infrastructure include:

- Healthy living – walking and bicycling promote good health
- Accessibility and choice – access to a viable network of bicycle and pedestrian facilities allows for greater independence and choice in determining travel modes
- Strong communities – bicyclists and pedestrians enhance a sense of community by increasing face-to-face interactions
- Cost effective – sidewalks and bicycle facilities cost less to build than vehicular roads and parking facilities
- More sustainable environments – fewer persons traveling by motor vehicle can reduce congestion and pollution

Chapter II also describes the purpose and process of, as well as the community outreach that occurred during, the development of the *Regional Plan Update*. Notably, a Project Technical Committee guided the development of the *Regional Plan Update*.

Chapter III outlines the vision, goals, an action strategies for the *Regional Plan Update.*

The vision is stated as:

> *SCRCOG and its member municipalities will encourage, promote; and continue to improve the conditions for bicycling, walking, and other forms of active transportation, so that any person, regardless of age, ability, or income will be able to walk, bicycle, or use other types of active transportation modes safely and conveniently throughout the Region.*

The four goals are as follows:

Goal 1: Improve safety of walking and bicycling to reduce the number of crashes involving pedestrians and cyclists.

Goal 2: Promote transportation choice by creating a balanced transportation system that offers a variety of practical and pleasant transportation options and allows residents to make walking and bicycling part of their everyday lives.

Goal 3: Increase connectivity between various modes of transportation (walking, trains, bicycling, private automobile, bus) and between neighborhoods, commercial areas, schools, parks, and other major community-serving destinations.

Goal 4: Provide access to community facilities, businesses, and neighborhoods for residents of all ages, all abilities, and all income levels.

Each goal includes a number of action strategies that propose specific ways in which the goals could be implemented.

The Connecticut Shoreline Bike & Boat Tour in Guilford *(Image credit: Trip Advisor)*

Corner of Main St and Campbell Ave *(Image credit: Wikipedia)*

Woodland Trail *(Image credit: Orange 2015 Plan of Conservation and Development)*

Elm Street bike lane *(Image credit: New Haven Register)*

Chapter IV provides details on bicycle and pedestrian travel in the SCRCOG region. It begins with providing accomplishments on the statewide level, including legislation that has passed and Connecticut Department of Transportation plans, programs, and policies that have improved the quality of bicycling and walking in the SCRCOG region and statewide.

Chapter IV next provides a regional overview and discusses some of the studies completed related to traffic calming, transit-oriented development, and specific corridors. Regional greenways and their planning efforts are described and displayed in a map.

The remainder of Chapter IV describes municipal planning efforts related to bicycle and pedestrian travel. For each of the 15 municipalities, their recent planning, design, and construction accomplishments are first discussed, followed by their on-going concerns and upcoming efforts. Many of the improvements to bicycle and pedestrian travel conditions are a direct result of the diligence of the municipalities that have prioritized this work.

Chapter V of the *Regional Plan Update* includes a safety and crash analysis. Early in the planning process, safety emerged as a primary concern and consideration within all the municipalities for any improvement project. Bicycle and pedestrian crash records were obtained for the years of 2012-2015 from the Connecticut Crash Data Repository. Crashes on U.S. Routes and state routes were analyzed for the years of 2012- 2014. Crashes on U.S. Routes, state routes, and local roads were analyzed for the year of 2015.

The crashes were analyzed by municipality, instead of looking at the SCRCOG region as a whole. With this, municipalities that were smaller in size / population and had fewer bicycle and pedestrian crashes were still analyzed in the same level of detail. Most crashes occurred in the more urbanized areas such as Hamden, Meriden, New Haven, and West Haven.

Chapter VI includes the recommendations. The recommendations are a compilation of the recommendations that are described in the Municipal Overview section of Chapter IV and the crash analysis in Chapter V within this document. The recommendations also include priority off-road routes for bicycling and walking as well as design and policy recommendations that can be implemented for those priority area routes as well as throughout the region. The primary reason to improve the on-road priority corridors and intersections in the region is to improve bicycle and pedestrian safety. The primary reason for completing the off-road trails in the region is to strengthen bicycle and pedestrian connectivity.

The top on-road and off-road recommendations are displayed in matrices on the following two pages.

Design recommendations are categorized by urban, suburban, and greenway applications. Examples of policy recommendations include a bicycle and pedestrian count program, continued development of and utilization of a Complete Streets toolbox, and others.

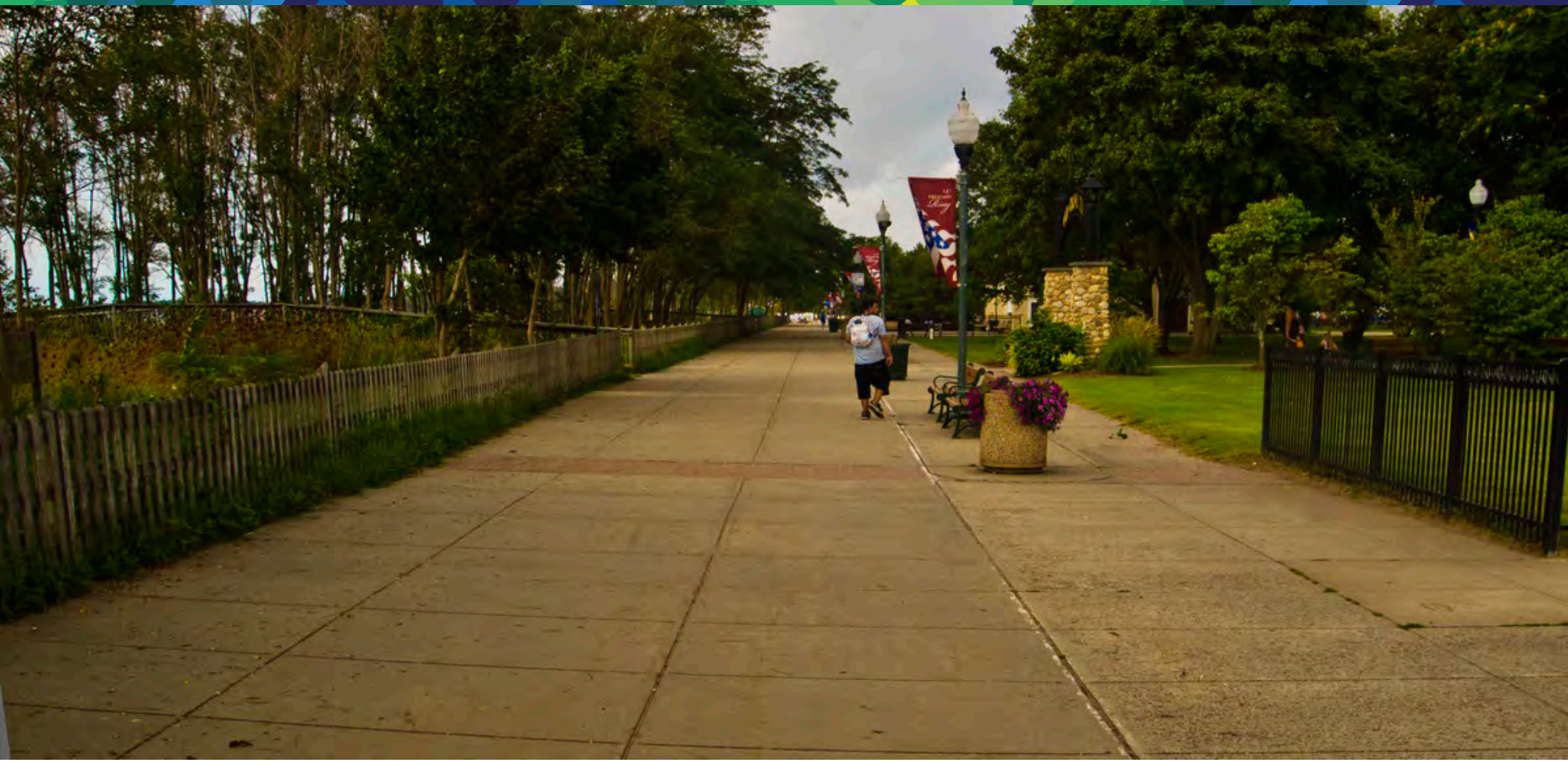
Priority Matrix (excerpt of highest priority on-road recommendations

MUNICIPALITY	AREA TYPE	CORRIDOR/ INTERSECTION	BEGIN/END	CRASH OCCURRENCE	INCLUDED IN 2007 SCRCOG PLAN	INCLUDED IN MUNICIPALITY'S POCD	COMMUNITY CONNECTIVITY RSA	INCLUDED IN STATEWIDE BIKE/PED PLAN	HIGH RIDERSHIP (STRAVA)	SCORE	PRIORITY LEVEL
Madison	Suburban Corridor	Route 1 (Boston Post Road)	Entire length town-wide	7 bike crashes	X	X		X	X	4	Very High
Milford	Suburban Corridor	Route 1 (Boston Post Rd/ Bridgeport Ave)	Entire length town-wide	15 ped crashes (1 fatal)	X	X	X	X		4	Very High
Hamden	Urban Corridor	Route 5 (State Street)	From Ridge Road to Cook Street	5 ped crashes, 1 bike crash	X	X		X		3	High
Wallingford	Urban Corridor	Route 5 (South/North Colony Road)	From Parsons Street to Church Street	4 ped crashes, 3 bike crashes	X	X		X		3	High
Branford	Urban Corridor	Route 1 (West Main Street)	From western town line to Short Beach Road	4 ped crashes	X	X				2	Medium-High
Branford	Suburban Corridor	Route 146 (Montowese Street)	From Meadow Street to Pine Orchard Road	3 bike crashes	X	X				2	Medium-High
Guilford	Suburban Corridor	Route 1 (Boston Post Road)	500 feet east and west of Tanner Marsh Road	2 ped crashes	X	X				2	Medium-High
Hamden	Urban Corridor	Route 10 (Dixwell Avenue)	500 feet north and south of Arch Street	4 ped crashes	X	X				2	Medium-High
Hamden	Urban Corridor	Route 10 (Dixwell Avenue)	1000 feet north and south of Church Street	7 ped crashes, 2 bike crashes	X	X				2	Medium-High
Hamden	Suburban Intersection	Route 10 (Dixwell Avenue)	At Hillcrest Avenue	2 ped crashes (1 fatal)	X	X				2	Medium-High

Off-Road Priority Areas

East Coast Greenway *(Trail of Regional Significance)*	The East Coast Greenway is planned to extend through Hamden, New Haven, West Haven, and Milford. The East Coast Greenway in the SCRCOG region is made up in part by the Farmington Canal Trail, Savin Rock Trail, Wharf Nature Preserve Trail, and Silver Sands State Park Path. Both the Savin Rock Trail, and the Farmington Canal Trail are in need of full completion.
Farmington Canal Trail *(Trail of Regional Significance)*	Within the SCRCOG region, the Farmington Canal Trail is planned to run through New Haven and Hamden. The portion of the trail within New Haven that extends from the West Haven town line to the city center is still in need of completion. This segment of the trail is currently in construction.
Shoreline Greenway Trail *(Trail of Regional Significance)*	The Shoreline Greenway Trail is planned to extend through New Haven, East Haven, Branford, Guilford, and Madison. The trail is still in need of completion in the municipalities of Branford, Guilford, East Haven.
Housatonic Riverbelt Greenway *(Trail of Regional Significance)*	Within the SCRCOG region, the Housatonic Riverbelt Greenway is planned to extend through Orange and Milford. The entire portion of the Housatonic Riverbelt Greenway in Orange and Milford is in need of completion.
Quinnipiac Linear Trail	Within the SCRCOG region, the Quinnipiac Linear Trail is planned to extend through North Haven, Wallingford, and Meriden. Approximately 1.25 miles of this trail is still in need of completion within Wallingford from Fireworks Island to the northern town line in Wallingford.
Harbor Brook Trail	The Harbor Brook Trail runs through Meriden. The trail is still in need of completion from approximately the Bronson Avenue Park area to West Main Street in Meriden.
Savin Rock Trail	The Savin Rock Trail is planned to run through West Haven towards the Milford town line, and also northerly towards trails in New Haven. The trail is still in need of completion from Bradley Point Park westerly to the Milford town line, and also from the Sandy Point Bird Sanctuary to the Yale campus in New Haven.
Harborside Trail	The Harborside Trail is planned to run through New Haven from the mouth of the West River to Lighthouse Point. The entire portion of the Harborside Trail is still in need of completion.

Chapter II
INTRODUCTION



A. The Value of Bicycling and Walking

Bicycling and walking are not only effective and enjoyable forms of exercise, they are also efficient and environmentally-friendly modes of transportation. There is a growing recognition that supporting active transportation modes reduces travel costs, congestion, and pollution while creating a more multi-modal and connected transportation network overall. This recognition is evident in the steadily increasing demand for bicycling and walking facilities on roads and trails in the SCRCOG region in recent years.

What is Active Transportation?

Active transportation refers to any form of human-powered transportation – walking, cycling, using a wheelchair, in-line skating or skateboarding. There are many ways to engage in active transportation, whether it is walking to the bus stop, or cycling to school / work.

~Public Health Agency of Canada

Meriden Train Station *(Image credit: Subway Nut)*

And while most of the region's residents do not rely solely on walking to reach their destinations, nearly everyone walks for at least a portion of their travel each day, whether from a parking lot to an office building or store, as a form of exercise, or to connect with another travel mode such as a train or bus.

Residents value being able to safely and comfortably bicycle and walk in their towns and cities. They understand the health benefits of active transportation, and that the associated infrastructure can change a community's character for the better. Greenways (also known as multi-use trails) in particular are recognized by planners and economists as an amenity to real estate and municipalities. For example, homes near walkable and bikeable trails enjoy premiums of between five percent to ten percent, according to an analysis by Headwaters Economics, a research group focused on community development and land management issues (http://headwaterseconomics.org/wp-content/uploads/trails-library-property-value-overview.pdf).

The value of walking and bicycling is also recognized at the statewide level. The Connecticut Department of Transportation's (CTDOT) mission statement states that "walking and bicycling promote healthy lives, strong communities, and more sustainable environments." Furthermore, over the last

ten years, Connecticut General Assembly has enacted several laws promoting and prioritizing active transportation. See Chapter IV in this report for more details on relevant legislation.

Some of the valuable benefits of active transportation and its associated infrastructure are highlighted in the following sections.

Healthy Living

Walking and bicycling promote good health. The U.S. Department of Health and Human Services recommends 10,000 steps per day to achieve better health and fitness. Bicycling is a low-impact exercise that improves overall balance and coordination. Both activities increase the health of the heart and cardiovascular systems and can improve resistance to obesity related health problems such as strokes, diabetes, and cancer.

Accessibility & Choice

Access to a comprehensive network of facilities such as sidewalks, crosswalks, and bike lanes allows people to exercise greater independence in choosing how they want to travel. Without these facilities, people will resort to traveling by personal vehicle or engaging in unsafe walking and biking practices. Limited transportation options are not only an inconvenience but also present an issue of social equity for those who do not have the option to drive, such as people who cannot drive due to their age, cannot afford a car, or have disabilities.

Strong Communities

Pedestrians and bicyclists enhance the sense of community in small towns and big cities worldwide. Pedestrians move at a slow speed and have face-to-face interaction with and maneuver around other pedestrians. Bicyclists, likewise, must communicate with other travelers with eye contact, audible

Student walking from Meadowside Elementary School in Milford *(Image credit: Connecticut Post)*

Advocates for the Shoreline Greenway Trail in the Guilford Fair parade *(Image credit: Shoreline Greenway Trail)*

Did you know?

Homes near walkable and bikeable trails enjoy premiums of between five percent to ten percent, according to an analysis by Headwaters Economics, a research group focused on community development and land management issues.

means (such as verbal signals, bells, and horns) and hand signals. Providing safe and convenient pedestrian and bicycle facilities improves access to and connection between community events, schools, parks, places of worship, and small businesses.

Cost Effective

The cost of building sidewalks and bicycle travel facilities is significantly less than building roads and parking facilities for motor vehicles and buses, or rail lines and stations for trains. In addition, there are a wide variety of low-cost measures that can be implemented without construction and the associated costs and delays, from painted bike lanes to strategically-placed planters. Funds spent to build and maintain bicycle and pedestrian facilities can stretch further than those spent on other modes.

This cost-effectiveness also applies to individuals. Walking and bicycling are affordable forms of transportation. The cost of walking and bicycling is much less than the cost of driving a motor vehicle, which includes the cost of purchasing, insuring, fueling, and maintaining the vehicle. Bicycling and walking also cost less than regular transit use. For walking, one only needs a comfortable pair of walking shoes. For bicycling, one needs a bicycle, lock, helmet, and both front and rear lights for nighttime travel.

When people can walk and bike more, they can spend less on transportation, meaning they have more money to save or spend on other things. If automobile travel is the

Whitney Avenue in Hamden *(Image credit: Coldwell Banker)*

only feasible mode of transportation in a community, low-income families are placed at a large disadvantage with very limited mobility. By providing safe, convenient, and connected pedestrian and bicycle facilities, the community can ensure that all citizens have access to a viable mode of transportation.

More Sustainable Environments

Reduced Congestion

When more people bike and walk vehicular congestion can be reduced. Many streets and highways carry more traffic than they were designed to handle, resulting in gridlock, wasted time and energy, and driver frustration. Walking and bicycling require significantly less space per traveler than driving. Roadway improvements to accommodate pedestrians and bicyclists also can enhance safety for motorists. For example, adding wider paved shoulders gives drivers more clearance space to avoid obstacles in the roadway, and avoid having to depart the roadway.

Reduced Pollution

Motor vehicles also create a substantial amount of air pollution. According to the EPA, transportation is responsible for nearly 80 percent of carbon monoxide and 55 percent of nitrogen oxide emissions in the U.S. Not surprisingly, many metropolitan areas do not meet the air quality standards specified in the 1990 Clean Air Act Amendments. Although individual cars are much cleaner today than they were in earlier years, if total traffic continues to grow, overall air quality will continue to deteriorate. Moreover, every day cars and trucks burn millions of barrels of oil, a non-renewable energy source. In 2010, World Watch Magazine estimated that "a bicycle commuter who rides four miles to work, five days a week, avoids 2,000 miles of driving and (in the U.S.) about 2,000 pounds of CO_2 emissions, each year. This amounts to nearly a five percent reduction in the average American's carbon footprint (World Watch Magazine, www.worldwatch.org/node/6456, 2010).

Whitfield Street, Guilford *(Image credit: Destination 360: Guilford, CT)*

Did you know?

Though each car varies, the EPA estimates that a typical passenger vehicle emits about 4.7 metric tons of carbon dioxide per year.

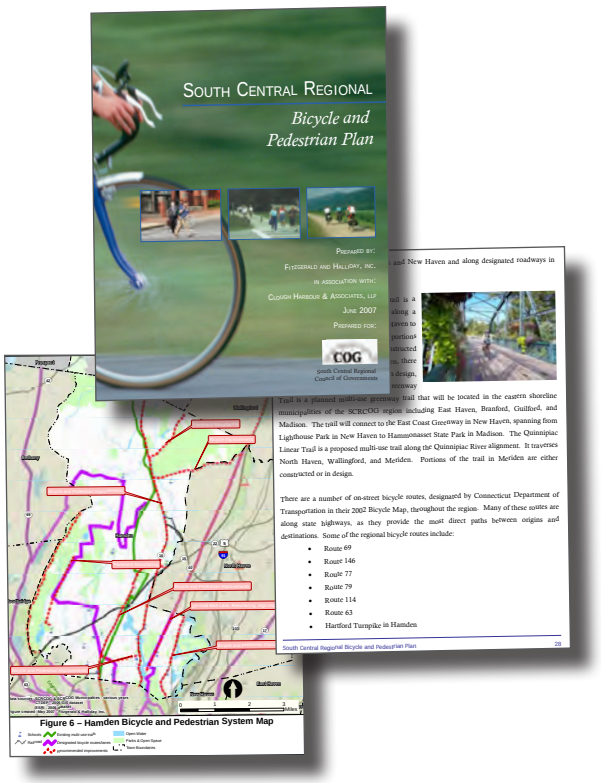
Your feet and bike, on the other hand, emit a total of zero metric tons of carbon dioxide per year!

Bilger Farm on Westfield Road in Meriden *(Image credit: My Record Journal)*

B. Plan Purpose

The *South Central Regional Bicycle and Pedestrian Plan Update (Regional Plan Update)* represents an update to the previous 2007 *South Central Regional Bicycle and Pedestrian Plan (2007 Regional Plan),* and provides recommendations geared to accommodate active transportation in the region. The *Regional Plan Update* is intended to provide a conceptual framework for increasing the desirability and effectiveness of bicycle and pedestrian transportation throughout the SCRCOG region. It is intended to accomplish the following:

- Collect and assess the existing conditions in the region as well as update the bicycle and pedestrian-related goals for the future,
- Ensure that the region stays on track to create a safer and more balanced transportation network, accessible for all users regardless of age, physical capacity, or income,
- Review the progress made in the last ten years, as well as the shifting needs, concerns and desires of each of the fifteen municipalities, and
- Provide the region with a prioritized list of areas that are in need of bicycle and pedestrian improvements, so that spending on such improvements can be appropriately distributed.



C. Planning Process

The *Regional Plan Update* was prepared by Fitzgerald & Halliday, Inc. (FHI) for the South Central Regional Council of Governments (SCRCOG).

The *Regional Plan Update* was developed over a 14-month period. The Project Team received guidance throughout the process from a Project Technical Committee (PTC) that included representatives from the planning and engineering / public works departments of the municipalities.

The data collection effort included gathering information from the Plans of Conservation and Development (POCDs) for each municipality, Road Safety Audits (RSAs) conducted in the municipalities, bicycle and pedestrian crash records that were accessible through UCONN's Crash Data Repository, the *Connecticut Statewide Bicycle and Pedestrian Plan Update (2017 Statewide Plan Update)*, and available Strava ridership data. Strava is a leading website and smartphone app that allows users to track their bicycle rides, runs, walks, and more, and to share their favorite routes with other users. The app also collects anonymous data from its users, including information when people are traveling and general origin and destination points. Analysis of this data allows planners and engineers to gain a better understanding of where trips are made on bicycle and what peoples' preferred routes are.

The Draft *Regional Plan Update* was presented for public review in June 2017, and resulting input was incorporated into the finalized version. The recommendations described herein should be incorporated into SCRCOG's broader processes and procedures over a five to ten year period.

D. Community Outreach

This effort included numerous opportunities for public and stakeholder involvement that informed and guided the development of the *Regional Plan Update.* The following summarizes the community engagement activities that occurred throughout this process.

WikiMap

A WikiMap web page was developed to gather input from the public about their biking habits and preferences within the region. People were able to draw on the map to indicate routes and places they either currently bike along / to or that they want to bike along / to. A pop-up survey then allowed the site's users to expand on what they identified on the map with comments. For example, people were given the opportunity to provide further detail on any areas they think have issues relating to safety for bicyclists.

The URL was directly accessible from the SCRCOG website. Members of the PTC and attendees of stakeholder meetings were also encouraged to participate in the online tool and distribute it to their networks.

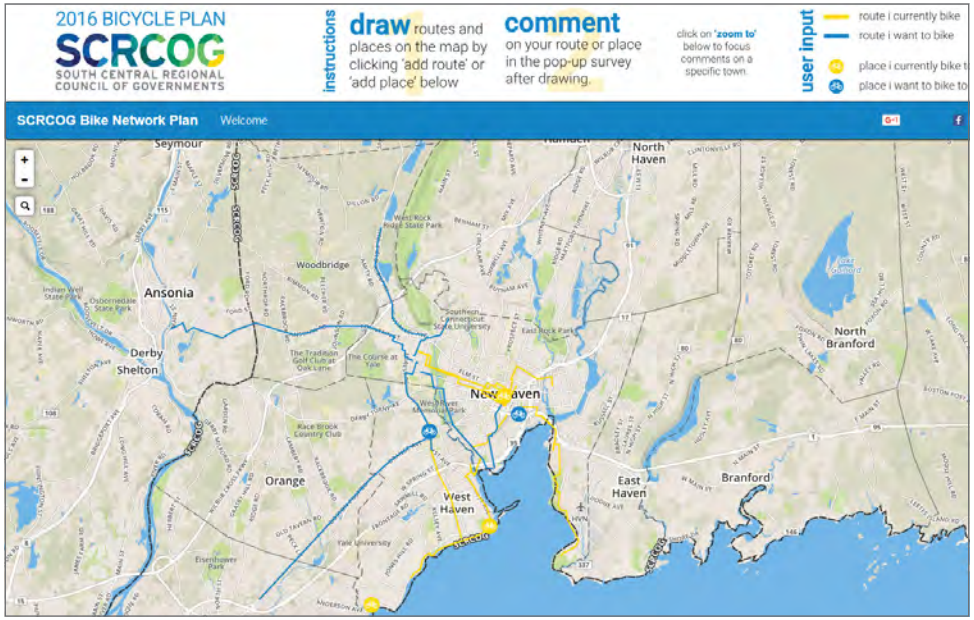
Input via the WikiMap primarily focused on routes to and from New Haven. Many of the routes participants indicated that they currently bike were in downtown New Haven or along the shoreline in West Haven, New Haven, and East Haven. The routes participants indicated that they want to bike along included U.S. Route 1 within the western area of the region, state route 243 along the northwest section of the region, and state route 69 in the northern area of the region. A full list of the routes identified by the public through the WikiMap is included below.

Routes that riders currently use:

- Chapel St, Forbes Ave, Waterfront St, Connecticut Ave, Woodward Ave, Townsend Ave, Lighthouse Rd - Downtown New Haven to East Shore Park to Lighthouse Point Park
- Chapel St, Elm St, Crown St, Orange St, Church St - Near New Haven Green
- Portions of Edgewood Ave near Edgewood Park

Routes that riders want to use:

- Route 243 – Ansonia / Woodbridge town line to Westville
- Forest Rd – Westville, New Haven
- Route 1 - University of New Haven through West Haven, Orange, and Milford
- Route 69 – Woodbridge to Whalley Ave
- McKinley Ave / Farnham Ave - Westville to Southern CT State University, New Haven
- Route 10 – Yale Bowl (Chapel St) to waterfront (Sea St), New Haven
- Howard Ave / Union Ave / Church St – Downtown (Chapel St) to waterfront (Sea St), New Haven



Screenshot of SCRCOG 2016 Bicycle Plan WikiMap, May 2017 *(Image credit: Toole Design Group)*

Project Technical Committee

The Project Technical Committee (PTC) was made up of representatives from each of the municipalities within the SCRCOG region. The PTC met with the Project Team three times during the development of the *Regional Plan Update* to provide key expertise and local knowledge about bicycling and walking throughout the SCRCOG region. Please refer to the Appendix for more information on the PTC, including membership and meeting summaries.

Meeting 1: May 11, 2016

This meeting introduced the PTC to the project with a presentation that included information about the purpose, schedule, goals, and vision.

The participants discussed how funding and laws relating to bicycle and pedestrian improvements have changed since the previous *2007 Regional Plan* was written a decade ago. It was agreed upon that, if possible, Complete Street concepts should be recommended for areas requiring bicycle and pedestrian improvements. The participants were also in consensus that the updated plan should provide recommendations for each municipality, but focus on prioritizing regional connections that will be determined by the *2017 Statewide Plan Update*.

Meeting 2: October 12, 2016

This meeting focused on the planned methodology for developing the recommendations included in the *Regional Plan Update,* which is intended to be more data-driven than the previous plan's recommendations and provides a more solid foundation for implementation.

In order to make the recommendations more data-driven, an extensive review of bicycle and pedestrian crashes across the South Central Connecticut region was conducted and presented to the PTC. The areas with high concentrations of crashes provided a starting point for the recommendations in the Regional Plan Update.

Methods for how to best prioritize the identified segments were also discussed. The PTC generally suggested that the following factors should increase a segment's priority, or ranking:

- Is identified in the local Plan of Conservation and Development (POCD)
- Has a completed RSA
- Fills a gap
- Increases connectivity

Meeting 3: June 14, 2017

During this meeting, the Project Team reviewed the methodology that was presented the previous meeting and presented the draft *Regional Plan Update,* including the recommendations such as the ranking of priority areas. The PTC discussed the intersections and corridors that had been prioritized as well as the policy recommendations. Following the presentation, the Project Team received comments and questions. This input was then considered and incorporated into the development of the *Final Regional Plan Update.*

Stakeholder Outreach

Elm City Cycling, May 8, 2017

The Project Team attended the Elm City Cycling monthly meeting in May 2017 to provide an overview of the *Regional Plan Update* and gather input. The presentation included an overview of the project's purpose, objectives, and process, which was guided by the PTC. It also provided information on the safety and crash analysis as well as a draft list of resulting priority segments and intersections.

Members of Elm City Cycling were then given an opportunity to ask questions and provide feedback. Feedback included the suggestion to incorporate locations of RSAs through CTDOT's Community Connectivity program into the identification of priority areas as well as specific suggestions on which connections should be prioritized. Additionally, attendees emphasized the importance of education and enforcement of legislation about bicyclists' rights and responsibilities.

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Chapter III
VISION, GOALS, & ACTION STRATEGIES

The vision and goals will be used by SCRCOG over the coming years to guide bicycle and pedestrian planning initiatives in the region.

The overarching vision guiding this update is consistent with the draft vision for the State of Connecticut. It states:

SCRCOG and its member municipalities will encourage, promote and continue to improve the conditions for bicycling, walking, and other forms of active transportation, so that any person, regardless of age, ability, or income will be able to walk, bicycle, or use other types of active transportation modes safely and conveniently throughout the Region.

The previous *2007 Regional Plan* put forth six goals with detailed objectives.

In light of the progress that has been made in the last ten years, as well as the shifting needs, concerns, and desires of the region's communities, the goals have been consolidated to better reflect the current status of pedestrian and bicycle transportation in the Region and to map out a path forward. The four goals are as follows:

Goal 1: Improve safety of walking and bicycling to reduce the number of crashes involving pedestrians and cyclists.

Goal 2: Promote transportation choice by creating a balanced transportation system that offers a variety of practical and pleasant transportation options and allows residents to make walking and bicycling part of their everyday lives.

Goal 3: Increase connectivity between various modes of transportation (walking, trains, bicycling, private automobile, bus) & between neighborhoods, commercial areas, schools, parks, and other major community-serving destinations.

Goal 4: Provide access to community facilities, businesses, and neighborhoods for residents of all ages, all abilities, and all income levels.

The objectives have been replaced with action strategies that propose specific ways in which the goals could be implemented. The list of action strategies is not all-inclusive, as other tools not listed may also be used. The updated goals and action strategies are outlined on the following pages.

GOAL 1: Improve safety of walking and bicycling to reduce the number of crashes involving pedestrians and cyclists.

ACTION STRATEGIES

1.1 Inventory existing sidewalks, on-road bicycle facilities, and multi-use trails to determine where potential safety issues exist. Encourage safety to be the number one priority in funding improvements to the bicycle and pedestrian network.

1.2 Monitor and analyze bicycle- and pedestrian-involved crash data.

1.3 Continuously update list of high priority locations where funding can be directed to address safety issues.

1.4 Develop and implement specific policies, improvements, and strategies to reduce bicycle- and pedestrian-involved crashes.

1.5 Coordinate policies and strategies with CTDOT and other State partners, as well as with other municipalities, to provide continuity from town to town.

1.6 Continue to support and fund local and regional studies that improve pedestrian and bicyclist safety.

1.7 Encourage maintenance of existing sidewalks, on-road bicycle facilities, and multi-use trails in a safe condition. Encourage maintenance of bicycle network routes.

1.8 Encourage roadway design features, where appropriate, to reduce traffic speeds and create more pedestrian and bicycle-friendly facilities that minimize vehicle, bicycle, and pedestrian conflicts.

GOAL 2: Promote transportation choice by creating a balanced transportation system that offers a variety of practical and pleasant transportation options and allows residents to make walking and bicycling part of their everyday lives.

ACTION STRATEGIES

2.1 Identify gaps in the sidewalk and bicycle networks. Supports efforts to prioritize funding to fill those gaps to create a more complete network of active transportation facilities.

2.2 Support the integration of pedestrian and bicycle facilities into road construction, reconstruction, and maintenance projects.

2.3 Continue to support the development and expansion of a linear network of multi-use trails, with a focus on completing missing sections of the Farmington Canal Heritage Trail and other regional trails.

2.4 Encourage the incorporation of best practices and innovative funding, design, and construction solutions.

GOAL 3: Increase connectivity between various modes of transportation (walking, trains, bicycling, private automobile, bus) & between neighborhoods, commercial areas, schools, parks, and other major community-serving destinations.

ACTION STRATEGIES

3.1 Prioritize safety improvements near intermodal facilities, such as bus stops and train stations.

3.2 Prioritize maintenance and upgrades of bicycle routes and pedestrian facilities that connect with bus routes and / or transit facilities.

3.3 Provide and maintain sufficient bicycle storage facilities (racks and / or lockers) near intermodal facilities. Coordinate with CTDOT to determine needs for bicycle storage at state-owned facilities.

3.4 Provide and maintain sufficient bicycle storage facilities (racks and / or lockers) near a variety of destinations – such as schools, community facilities, employment centers, medical facilities, and commercial areas – to help cyclists complete their trip.

3.5 When designating local bicycle routes, prioritize those that connect with bus routes and / or transit stations, as well as with existing and proposed multi-use trails (e.g. the Farmington Canal Heritage Trail).

3.6 Coordinate with CTDOT to ensure that state-designated bicycle routes connect with bus routes and / or transit stations, as well as with existing and proposed multi-use trails (e.g. the Farmington Canal Heritage Trail).

3.7 Encourage new development and private investment in the vicinity of transit stations and bus hubs.

GOAL 4: Provide access to community facilities, businesses, and neighborhoods for residents of all ages, all abilities, and all income levels.

ACTION STRATEGIES

4.1 Identify pedestrian facilities that do not currently comply with ADA requirements and / or best practices (e.g. intersections without curb ramps, narrow sidewalks, etc.) and prioritize these locations for upgrades.

4.2 Prioritize areas that have a large concentration of environmental justice, particularly low-income, residents and workers, when targeting bicycle and pedestrian improvements.

4.3 Develop municipal policies to ensure that all upgrades and new construction meet or exceed ADA requirements and best practices for accessible design.

4.4 When designating local bicycle routes, prioritize those that connect environmental justice, particularly low-income, residents and workers with bus routes and / or transit stations.

Chapter IV

BICYCLE & PEDESTRIAN TRAVEL

This chapter provides a summary of recent bicycle and pedestrian policy, planning, and advocacy efforts at the state, regional, and local levels. These planning efforts provide a strong foundation for the region to build upon as it continues to make strides in the coming years.

A. Statewide Overview

A number of statewide efforts have advanced the state of bicycle and pedestrian travel in Connecticut and the SCRCOG region in recent years. These efforts are listed below.

1. Legislation

In recent years, the Connecticut state legislature passed three laws that influence pedestrian, bicycle, and transit-friendly design and culture. They are described in the following paragraphs.

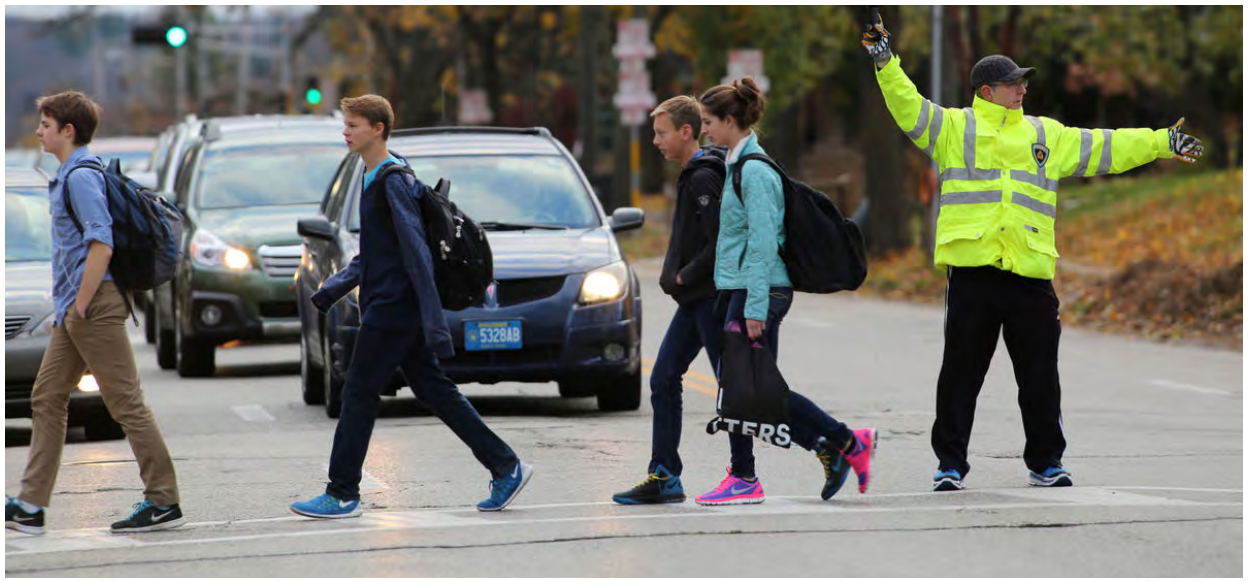
An Act Improving Bicycle and Pedestrian Access (Public Act 09-154)

This 2009 law established the statewide Bicycle and Pedestrian Advisory Board, an appointed, administrative, 11-person board. Its role is to examine the need for bicycle and pedestrian transportation, promote programs and facilities for bicycles and pedestrians in this state, and advise appropriate agencies of the state on policies, programs and facilities for bicycles and pedestrians. This law also established minimum funding targets which requires CTDOT to designate no less than one percent of its funding to bicycle and pedestrian projects. In addition, this law requires that pedestrians, cyclists, and transit users be routinely considered in the planning, designing, construction, and operation of all roads. This is a concept known as Complete Streets.

Vulnerable User Law (Public Act 14-31)

This law, passed in October 2014, provides a level of protection for pedestrians and bicyclists by defining them as vulnerable users. While vulnerable users accept some level of risk by walking or bicycling on a roadway, drivers are required to accept some level of responsibility if a crash does happen. This law provides an added, financial disincentive to irresponsible behavior that puts vulnerable users at risk. A fine is prescribed for any driver who fails to exercise reasonable care and causes the serious physical injury or death of a vulnerable user.

Motorist providing bicyclist with a safe amount of room while passing *(Image credit: Vimeo - Indian River County)*



Students along a pedestrian crossing with the help of a crossing guard *(Image credit: The Capital Times)*

Bicycle Safety Bill (Public Act 15-41)

Signed into law in June 2015, this law requires cyclists to ride as close to the right side of the road "as is safe, as judged by the cyclist." This supersedes the previous law that required cyclists to ride as far right "as practicable", which could have included instances where a bicyclist is preparing to make a left turn at an intersection or onto a private road. Drivers are also allowed to cross double yellow lines to pass slower-moving bicyclists when it's safe to do so. Additionally, this law allows two-way bicycle lanes, buffered bike lanes, and cycle tracks to be designed in Connecticut.

Pedestrian crossing in New Haven *(Image credit: See Click Fix)*

2. Connecticut Department of Transportation Plans, Programs, & Policies

Let's Go CT! - Connecticut's Bold Vision for a Transportation Future, (CTDOT, February 2015)

This Statewide Transportation Plan seeks to provide the "transportation foundation for the future of Connecticut's economy" and emphasizes the need to secure dedicated transportation funding.

COMMUNITY
connectivity program

Road Safety Audit along Amity Road and Fairwood Road southerly to Peck Road in Bethany *(Image credit: Community Connectivity Website)*

Community Connectivity Program

As part of the *Let's Go CT!* transportation plan, the Community Connectivity Program focuses on improving accommodations for bicyclists and pedestrians in community centers across the state.

One component of this program is that CTDOT has assisted municipalities in the completion of RSAs on key corridors and intersections for bicyclists and pedestrians that are identified by local officials. The RSA is a formal safety assessment of the existing conditions of walking and bicycling routes and is intended to identify bicycle and pedestrian needs at these selected locations and develop low and high-cost recommendations to improve the conditions.

Community Connectivity in SCRCOG

Four towns in the SCRCOG region requested and received RSAs through the Community Connectivity Program. These towns are Bethany, Meriden, Milford, and Woodbridge. The RSA included a pre-audit meeting, a field audit, and a post-audit meeting. After its completion, each municipality received a report that detailed the RSA results, including the resulting short-term and long-term recommendations for safety improvements. A summary of the RSA Reports can be found in the 'Municipal Overview' chapter of this document.

Crash Data Collection Initiative

In 2015, CTDOT developed a Connecticut Uniform Police Crash Report (PR-1) which all police must use at crash scenes. The goal is to align Connecticut's system with national crash data guidelines and to leverage efficiencies gained with electronic reporting. These forms will identify crashes that involve pedestrians and bicyclists, and allow improvements to better target unsafe roadways and intersections.

Complete Streets Policy (No. Ex.O.-31)

In 2014, in response to 2009 Public Act 09-154, Connecticut General Statute 13b-13a, CTDOT adopted a Complete Streets Policy (No. Ex.O.-31). The policy lays out how CTDOT will integrate complete streets into its work.

Walk It Bike It: Connecticut Safe Routes to School Program

The Safe Routes to School (SRTS) Program began in 2005 with the goal to empower communities to make walking and bicycling to school a safe and routine activity for children in Kindergarten through eighth grades. While funding is no longer available through this program, it continues to provide valuable resources such as the Champion Toolkit that contains all the starter kit information for getting a new Safe Routes to School (SRTS) Program started or making improvements to an existing program.

VIP Paving Program

CTDOT has begun the practice of reducing lane widths to 11 feet, where applicable. In this process, CTDOT Office of Traffic typically determines whether it is appropriate to reduce the lane width during the routine repaving and restriping of roads.

B. Regional Overview

1. Regional Bicycle and Pedestrian Network

Bicycle and pedestrian travel conditions have improved across the SCRCOG region. This progress has meant different things to different municipalities, depending on what is contextually appropriate. While more urban areas have focused on infrastructure such as separated bike lanes and developing more vibrant streetscapes along sidewalks, suburban and rural areas have often dedicated efforts toward filling in gaps in the sidewalk network to strengthen connections to key destinations, such as town centers, and widening shoulders to accommodate bicyclists where possible. There has also been efforts across the entire region to create more bicycle and pedestrian friendly environments in both town centers and around train stations. These efforts have been described in detail in the following section that focuses on the municipalities.

An example of a shoulder widening as a result of the VIP Paving Program *(Image credit: CTDOT)*

2. SCRCOG Initiatives

Similar to the rest of the state, there has been an increasingly strong interest in the improvement of bicycle and pedestrian facilities in the SCRCOG region of Connecticut. Since 2007, SCRCOG has continued to respond to this growing demand for such facilities through a variety of projects and initiatives that have sought to create a more suitable environment for bicyclists and pedestrians. A sampling of these planning efforts are described below.

Traffic Calming

SCRCOG has been responsible for the completion of a number of traffic calming studies for many of the region's municipalities. Traffic calming involves the use of modifications to a roadway's design and other measures to discourage speeding, thereby improving the safety for all the roadway's users, including motorists, pedestrians and cyclists. Examples of how traffic calming can be achieved are through inclusion of median islands, curb bump-outs, speed humps, or offset on-street parking to offset a roadway's centerline.

Some of the traffic calming studies SCRCOG helped lead took a comprehensive look at a municipality's transportation network, such as the 2014 *Hamden Traffic Calming Study.* Other studies were specific focused on a single corridor, such as the *Town of North Haven Spring Road Traffic Calming Study* in 2011.

Additionally, SCRCOG developed the *Traffic Calming Resource Guide* for all municipalities in 2008, designed to be easily adaptable so it can serve as the "go to" resource as each municipality planned and implemented traffic calming.

Transit-Oriented Development

SCRCOG has also undertaken studies that have focused on Transit-Oriented Development (TOD). This is important because a strong bicycle and pedestrian network needs to provide connections to transit in order to support a truly integrated system. The first-last mile concept describes the challenge of helping people get to and from transit stations and stops. Also referred to as the "toughest mile", the solution often lies in the creation of a strong, multi-modal transportation network that allows people to easily use multiple modes that connect with one another. As such, investment in pedestrian and bicyclist infrastructure, such as sidewalks, safe street crossings, wayfinding signage, and bike lanes, that connect transit centers to other key destinations and neighborhoods is key.

SCRCOG has invested resources into TOD-related studies on both a municipal and regional scale. Examples include the *Regional Transit-Oriented Development Study* in 2015 and the 2016 *Meriden Transit Center - "First Mile, Last Mile" Study*.

Corridor Studies

Additionally, SCRCOG has contributed and / or led numerous studies that focus on one specific corridor within a municipality to address existing traffic-related issues and to create a more multi-modal corridor. These studies typically include bicycle and pedestrian improvements, such as the 2012 *City of New Haven Foxon Boulevard Corridor Study*.

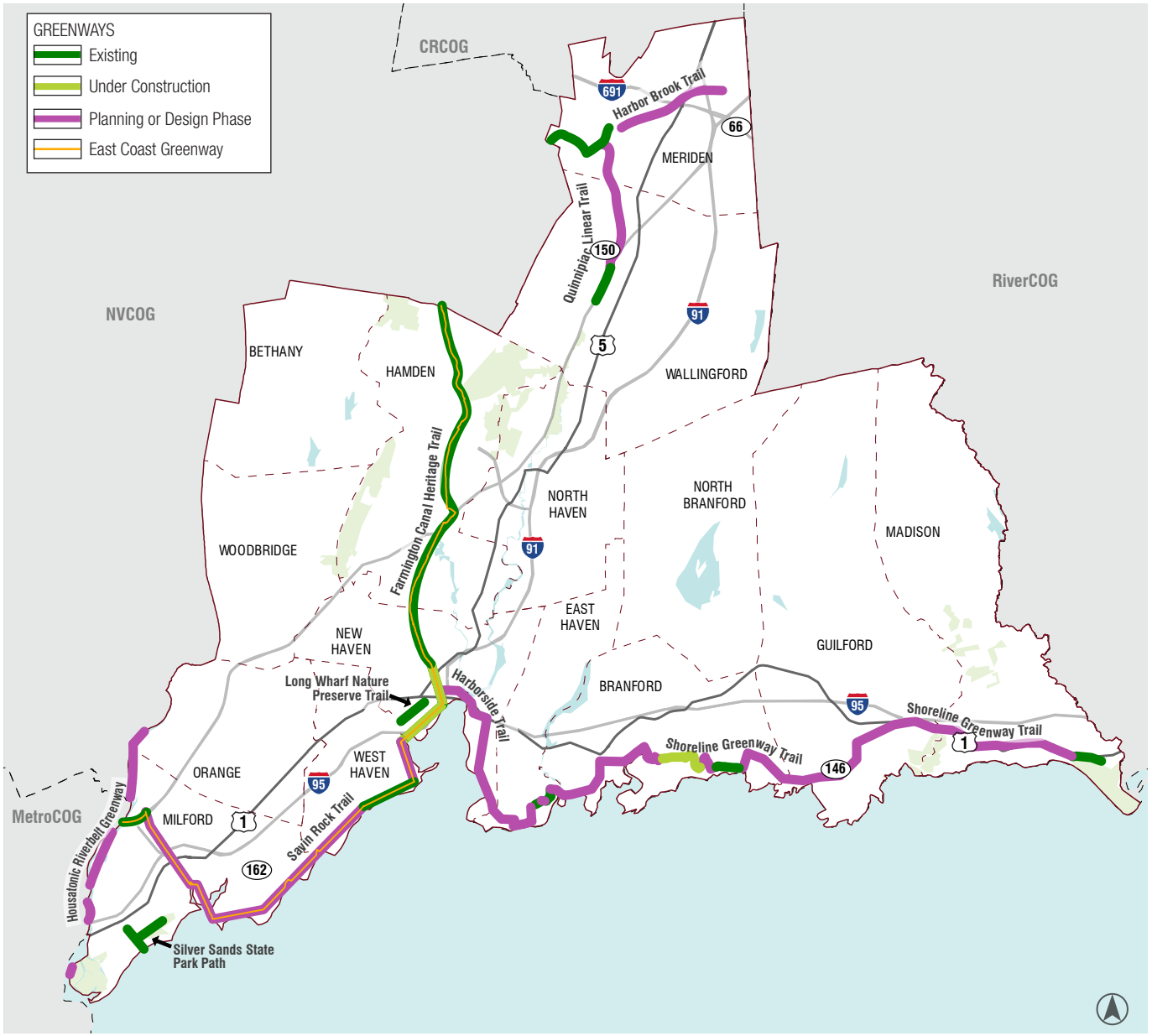
Comprehensive Network Studies

SCRCOG has also led planning efforts that have a broader approach to ensure that bicycle and pedestrians are accommodated in the overall transportation system. This includes the on-road transportation network, such as the *Town of Hamden East / West Study* in 2011, as well as the trail system, such as the 2010 *Shoreline Greenway Trail Study*.

3. Greenways in the Region

A number of greenways are located the SCRCOG region. A greenway is a linear open space separated from road traffic, set aside for recreation and active transportation. Most greenways are paved and can be used for walking, running, biking, inline skating, and wheelchair travel. Because of this variety of users, greenways are also referred to as multi-use trails.

Some of the region's greenways traverse multiple municipalities and / or cross into neighboring regions. The trails are in various stages of planning and completion, with the goal of closing gaps and improving local connections to the trails. The location and status of each of the key regional trails is illustrated in the map to the right. A brief description of each trail is also included in the following sections.



SCRCOG Greenways, April 2017 *(Sources: Fitzgerald & Halliday, Inc., Department of Energy & Environmental Protection, Meriden Linear Trail, Shoreline Greenway Trail, Farmington Canal Rail to Trail Association, Trail Link, New Haven Land Trust)*

East Coast Greenway

Description: This trail is planned to span approximately 3,000 miles from Maine to Florida. It is almost entirely on public right-of-way, incorporating waterfront esplanades, park paths, abandoned railroad corridors, and canal towpaths. The East Coast Greenway runs through portions of the Farmington Canal Trail, Savin Rock Trail, Long Wharf Nature Preserve Trail, and Silver Sands State Park Path in the SCRCOG region municipalities of Hamden, New Haven, West Haven, and Milford.

Status: Today, approximately 30 percent (834 miles) of the Greenway is in place as an off-road, traffic-free trail nationwide. There continues to be strong support for completion. Within the SCRCOG region, approximately 60 percent (16.5 miles) of the total 27 miles in the SCRCOG region have already been constructed.

East Coast Greenway *(Image credit: Urban Adventours)*

Farmington Canal Trail

Description: The Farmington Canal trail is planned to extend from New Haven, Connecticut to Northampton, Massachusetts. Within the SCRCOG region of Connecticut, the trail runs through the municipalities of New Haven and Hamden. It runs along a former canal and rail line. The finished trail is a smooth 10-foot wide paved swath.

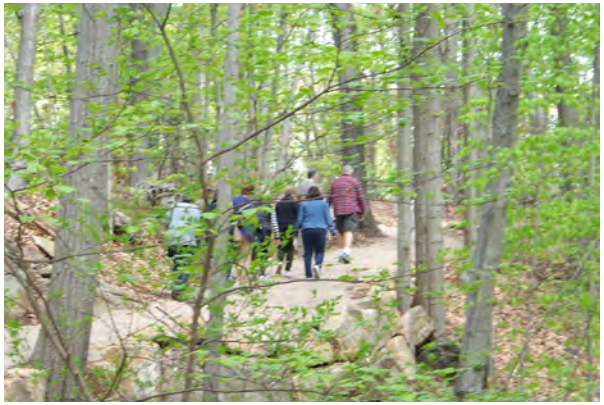
Status: In Hamden, all sections have been completed from the New Haven town line to the Cheshire town line. In New Haven, approximately half of the trail has been completed. The portion extending from the city center to the West Haven town line is currently under construction.

Farmington Canal Greenway near the Hamden-New Haven border *(Image credit: The Airship)*

Shoreline Greenway Trail

Description: This trail is planned to traverse 25 miles from Lighthouse Point in New Haven to Hammonasset Beach in Madison. When completed, the trail will pass through the SCRCOG region municipalities of New Haven, East Haven, Branford, Guilford, and Madison. The majority of the trail is planned to be a crushed granite, packed stone surface that's accessible for all.

Status: Portions of the trail have been completed in Branford, Madison and East Haven. These completed sections currently make up approximately 2.8 miles. The newest segment opened in Farm River State Park in East Haven and segments of the trail in Branford are currently under construction, scheduled to open in the fall of 2017. Other segments in Branford as well as those in Guilford and East Haven are still in the planning or design phase.



Shoreline Greenway Trail in Farm River State Park in East Haven *(Image credit: Shoreline Greenway Trail)*

Housatonic Riverbelt Greenway

Description: This trail is planned to extend through 29 different municipalities in both Connecticut and Massachusetts alongside the Housatonic River. Several segments have been completed, and the trail may extend into the SCRCOG region of Connecticut municipalities of Orange and Milford.

Status: The extension of the Housatonic Riverbelt Greenway trail into the Towns of Orange and Milford is in the conceptual phase and no official plan has been developed.

Housatonic Riverbelt Greenway in New Milford *(Image credit: Connecticut Post)*

Housatonic Riverbelt Greenway / Old Mill Trail in Massachusetts *(Image credit: TrailBuilders)*

Quinnipiac Linear Trail

Description: The Quinnipiac Linear Trail is a planned fifteen-mile multi-use trail along the Quinnipiac River, traversing North Haven, Wallingford, and Meriden.

Status: A 1.2 mile portion of the trail in has been constructed in Wallingford; an additional 1.3 mile segment connecting to Yalesville is in design. Currently, these two areas are separated by the Wilbur Cross Parkway. In Meriden, the two segments have been constructed: the Quinnipiac River Gorge Trail (1.3 miles) and the Hanover Pond Trail (1,300 ft).

Quinnipiac River Linear Trail in Wallingford *(Image credit: TripBuzz)*

Pedestrian bridge for Quinnipiac River Linear Trail in Wallingford *(Image credit: My Record Journal)*

Savin Rock Trail

Description: This trail consists of approximately one mile of paved pathway. It currently extends along the southern coastline of West Haven from Bradley Point Park to the Sandy Point Bird Sanctuary, but is planned to be extended westward towards the Milford town line and also northerly towards trails in New Haven. It is part of the East Coast Greenway.

Status: This trail is completed, but could potentially continue along the West Haven shoreline, westerly towards Milford, and northerly towards New Haven.

Savin Rock Trail in West Haven *(Image credit: Two RV Gypsies: Full-Time RVers)*

Harborside Trail

Description: This is a planned trail that will span the shoreline of New Haven from the opening of the West River to Lighthouse Point. It will help close the gap between the future western side of the Shoreline Greenway Trail in New Haven and the eastern side of the Savin Rock Trail in West Haven.

Status: This trail has been fully planned. No portions of the trail have been constructed yet.

Long Wharf Nature Preserve Trail

Description: This short trail runs less than one mile, but gives pedestrians and bicyclists excellent access to waterfront in New Haven. It runs parallel to Long Wharf Drive and I-95.

Status: The trail is currently in New Haven and there are plans to extend it south to West Haven.

Entrance to Long Wharf Nature Preserve Trail in New Haven *(Image credit: Connecticut Department of Energy & Environmental Protection Coastal Access)*

Harbor Brook Trail

Description: There are plans to extend this trail from Hanover Pond to West Main Street in the Town of Meriden. The completed trail will provide access from downtown Meriden to Hanover Pond, and to the Quinnipiac River Trail, which also passes by Hanover Pond.

Status: A small segment (approximately one mile) of this trail has been completed, spanning from Hanover Pond to the Bronson Avenue Park area.

Silver Sands State Park Path

Description: The Silver Sands State Park Path currently spans approximately 0.6 miles through the municipality of Milford. As the name suggests, the trail is based around the Silver Sands State Park.

Status: The trail is completed, and an extension is not currently planned.

Silver Sands State Park Path in Milford *(Image credit: Connecticut Explorer)*

C. Municipal Overview

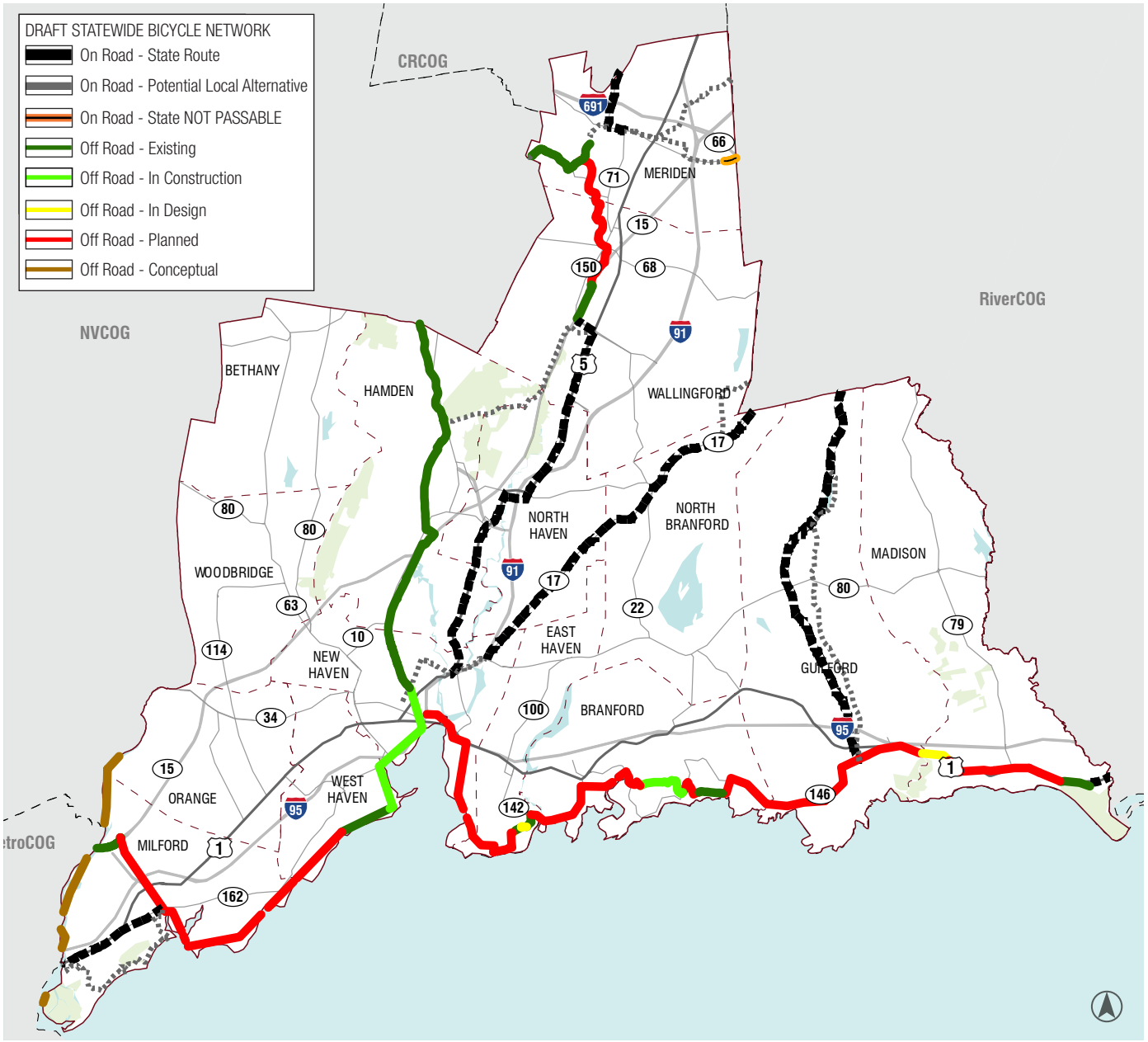
The municipalities in the SCRCOG region recognize the many resulting benefits from providing facilities for bicyclists and pedestrians for both their residents and visitors. While safety was identified as a primary benefit and consideration across all these communities, their distinct and unique characters have led to similarly distinct desires regarding the types of bicycle and pedestrian improvements that should be made in their respective towns or cities.

The desires and ideals of the municipalities are most commonly documented in their respective POCDs. The POCDs frequently indicate the existing bicycle and pedestrian conditions within the municipality and described the desired improvements to those conditions that the community would like to see within the next five to ten years. Some of the POCDs include maps that highlight specific desired areas for improvement to bicycle and pedestrian facilities. The following section includes a summary of these existing conditions and desired improvements that are outlined in each town or city's POCD.

It's also important to gain an understanding of how the desires for bicycle and pedestrian improvements within each municipality fit into the statewide network. The map to the right illustrates the statewide planning network within each municipality from the 2017 Draft

Connecticut Statewide Bicycle and Pedestrian Plan Update (2017 Draft Statewide Plan Update). It identifies both off-road multi-use trails and on-street bicycle facilities throughout the state.

Additionally, some municipalities have developed other initiatives and plans that relate to bicycle and pedestrian planning, such as the RSAs through CTDOT's Community Connectivity Program. Where applicable, these plans have also been summarized in the following sections.



Draft Statewide Bicycle Network *(Image credit: Draft 2017 Connecticut Statewide Bicycle and Pedestrian Plan Update)*

BETHANY

The Town of Bethany is located inland, in the northwest portion of the SCRCOG region. The land use in Bethany consists mostly of rural, wooded areas and open space with a small rural community center. The Town Center is centered around the Town Hall and Peck Pond. Bethany has unique attractions such as West Rock Ridge State Park, the Bethany Veterans Memorial Park, and Mount Sanford.

In 2015, the population in the Town of Bethany was 5,533, the lowest in the region. One percent of the workers over the age of 16 did not have access to a motor vehicle. The population density was relatively low at 259 persons per square mile. Bethany does not have a rail station within the Town, and has limited access to bus service.

Recent Accomplishments

Bethany recently implemented a policy that stated that all newly constructed local roads could not be wider than 22 feet. The purpose of this policy is to reduce the dominance of vehicular infrastructure over the scenic nature of Bethany. The Town also recognizes that narrower roadways can also help reduce vehicle speeds and make roadways more inviting for pedestrians and bicyclists.

On-going Concerns

Currently, there are very few sidewalks in the Town of Bethany, and the overwhelming majority of Bethany residents rely heavily on private vehicles for travel. Bethany's 2010 POCD states that the Town would like to provide for other modes of travel such as walking, biking, and horseback riding. The Town would also like to provide more basic amenities to the residents such as grocery stores and pharmacies. The concern, however, is that the Town could become overdeveloped, and its cherished rural character could be diminished.

An RSA was conducted in Bethany in June 2016. The RSA focused on bicycle and pedestrian conditions along Amity Road (Route 63) from Peck Road to Fairwood Road. The Town recognizes that this road is currently not bicycle- or pedestrian-friendly. Vehicle speeds are very high, and there are no sidewalks in the area.

The crash analysis performed in Chapter V of this report did not reveal any heavy concentrations of bicycle and pedestrian crashes in Bethany. This is largely a result of the fewer numbers of bicyclists and pedestrians using the streets of Bethany. The lower crash numbers, however, should not infer that the roads in Bethany are safer than in other municipalities.

Atwater Road *(Image credit: Bethany 2010 POCD)*

Bethmour Road *(Image credit: Bethany 2010 POCD)*

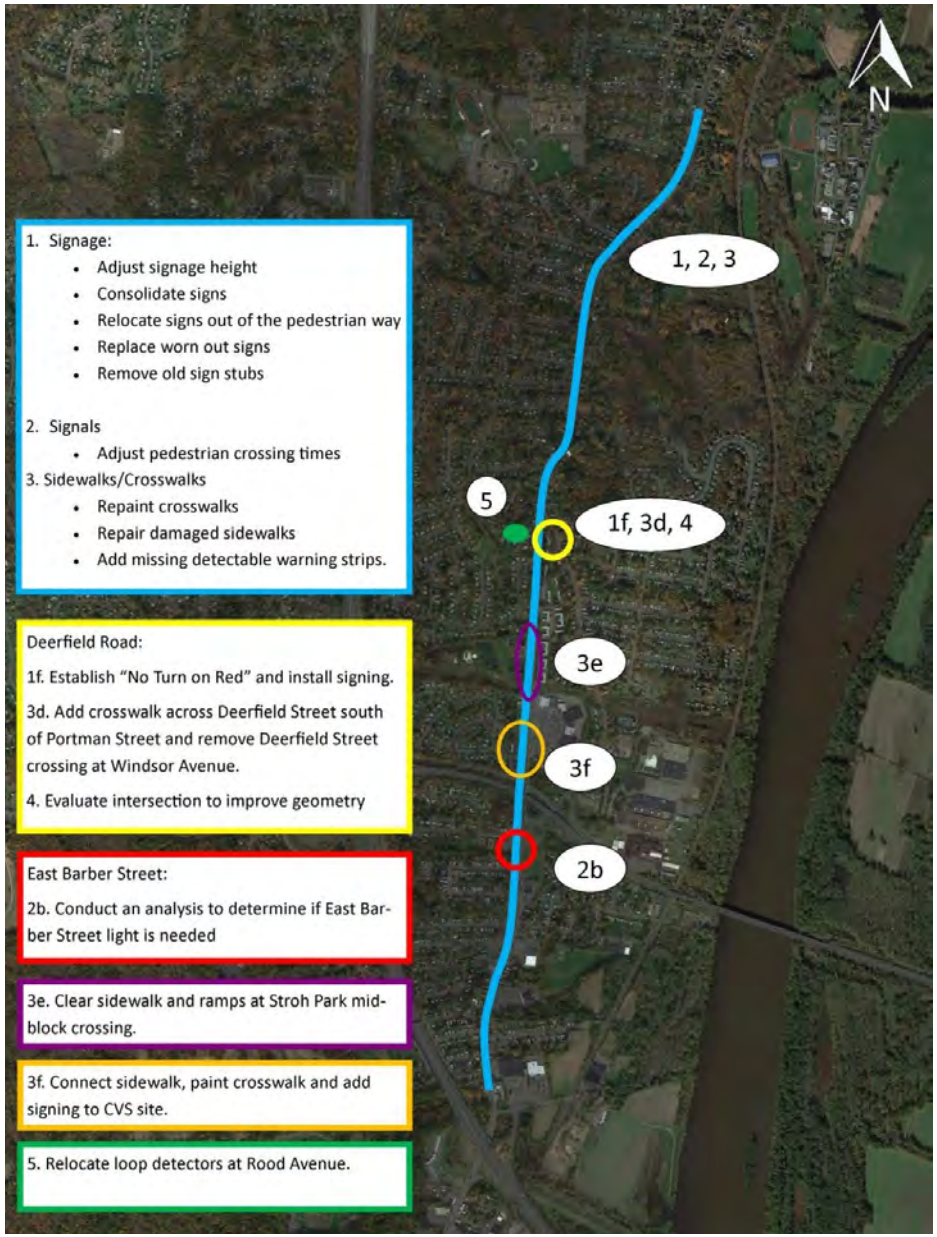
Amity Road *(Image credit: Bethany, Amity Road (Route 63) – Road Safety Audit (June 2016))*

Looking Ahead

Bethany would like to begin to provide more basic amenities in the Town. The development of such retail within Bethany itself could increase economic activity and support travel by modes other than driving. The Town envisions their future roadway network as conforming to the existing topography, being uncurbed, and being lined with scenic forests. Careful efforts will be taken to ensure that future development does not disrupt the rural ambiance within the Town.

Per the recommendations of the RSA, the Town would like to add pedestrian walkways along Amity Road (Route 63) to improve and encourage walking in the area. The Town believes that Amity Road has the potential to become a Town Center and would like to see building development along this corridor. The RSA proposes that vehicle lanes be narrowed and shoulders be widened as a short-term solution. In the future, Bethany would like this roadway to be a Complete Street with proper consideration for users of all modes of transportation and the environment.

Several minor recreational trails run through Bethany. The Town has expressed a desire to connect its recreational trails to neighboring recreational trails such as the Naugatuck Trail, the Quinnipiac Trail, the Sanford Feeder Trail, and the Mendell's Folly Trail.



Amity Road RSA Short-Term Recommendations; *(Image credit: Bethany, Amity Road (Route 63) – Road Safety Audit (June 2016))*

BRANFORD

The Town of Branford is located on the shoreline, in the central portion of the SCRCOG region. The land use in Branford consists largely of suburban development with some open spaces and conservation / wooded areas. The Town Center is centered around the Town Hall and commercial development along Main Street. Branford offers unique attractions such as the Thimble Islands, Lake Saltonstall, the Branford Green, and Stony Creek Beach.

In 2015, the population of Branford was 28,074, and one percent of the workers over the age of 16 did not have access to a motor vehicle. The population density of Branford was approximately 1,300 persons per square mile. Branford has a rail station that provides service to the Shoreline East Commuter Railroad.

Branford Town Center *(Image credit: Brandford Patch)*

Recent Accomplishments

The planned Shoreline Greenway Trail passes through Branford as an east-west multiuse trail for both bicyclists and pedestrians running parallel to Route 142 (Short Beach Road) and Route 146 (Montowese Street / Limewood Avenue / Hotchkiss Grove Road / Elizabeth Street). A segment of the trail that runs along Trolley Trail in Branford is open to the public and is 0.8 miles. Another segment that will connect Tabor Property Drive to Young's Pond Park is under construction and scheduled to open in the fall of 2017.

In addition, Branford is working to develop a TOD plan. This plan will outline strategies for facilitating appropriate development around the train station as well as strategies to connect the station to the Town Center including wayfinding signage, streetscape improvements, and place-making.

Branford Town Center *(Image credit: Branford Community Television)*

On-going Concerns

The lack of connectivity across Branford's transportation network is the primary issue concerning residents and Town staff. In particular, *Branford's 2008 POCD* notes that improved connections for bicyclists and pedestrians between the Branford train station and the Town Center is needed. And while the newly expanded Shoreline East Train Station has bicycle racks for parking, the area around the train station could benefit from an improved sense of place. There is also a need to complete the sidewalk infrastructure in these areas.

The *2008 Main Street Scenic Highway Gateway Study* identified several roadways intersecting with Main Street that were in need of crosswalks, including Cherry Hill Road, North Harbor Street, Lincoln / Bradley, Russell Street, John Street, Rogers Street, Cedar Street, Hopson Street, and Laurel Street. Sidewalk conditions along Main Street are poor and narrow from Lincoln Street to just west of Cherry Hill Road.

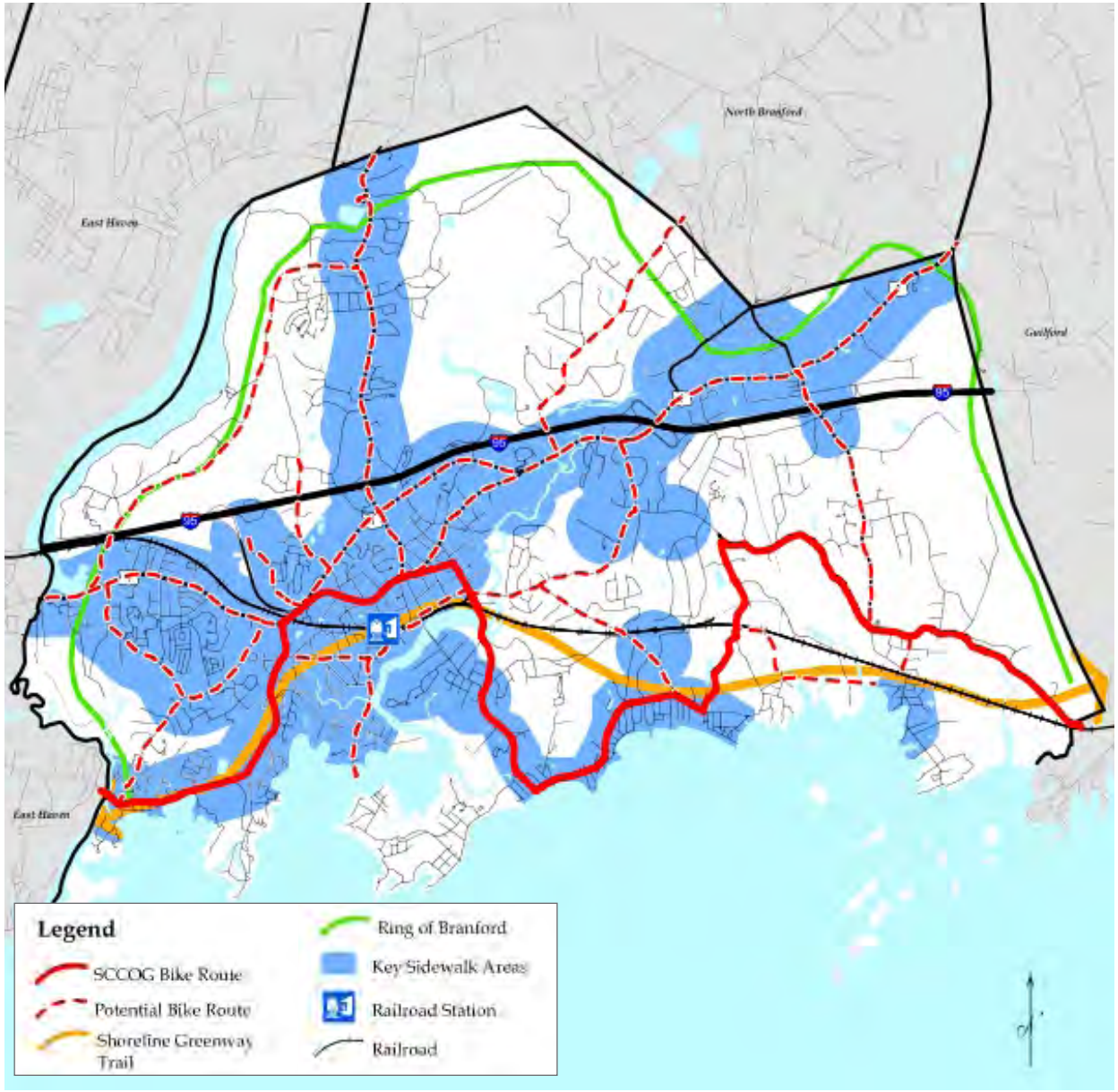
Branford's POCD states that Montowese Street, Main Street, and Route 1 are all known to have high crash rates; an issue that must be addressed. The crash analysis performed in Chapter V of this report revealed two areas where bicycle and pedestrian crashes were concentrated. These two areas were along Route 1 (West Main Street) from the western Town line to Short Beach Road and along Route 146 (Montowese Street) from Meadow Street to Pine Orchard Road.

Looking Ahead

Branford would like to use gateway treatments around the train station area in order to improve its sense of place. Gateway treatments in this area would also act as key highway entrances to the Town as well a traffic calming measure that would help improve safety.

In order to address the safety issues on Montowese Street and West Main Street, Branford states in the their POCD that they would like to decrease road widths and add street trees. Both of these measures would help calm traffic. In addition to facilitating Transit Oriented Development around the Branford Train Station and Town Center, the Town also envisions the concentration of additional development into existing village centers and new "nodes" of development. These new "nodes" are contemplated for two locations along Route 1 - Exit 56 and the "Branford Hills" portion of West Main Street. These "nodes" of more intensive development could enhance a sense of place, improve pedestrian safety and would include improved sidewalks and access management.

Branford is continuing to advocate for the design and construction of the Shoreline Greenway Trail, essential for east-west pedestrian and bicycle travel through the town. Second to the completion of the Shoreline Greenway Trail, Branford would like to develop a ring of connected trails that span the perimeter of Branford's political boundary and enact a complete streets program.



Transportation Plan: Pedestrian & Bicycle *(Image credit: Branford 2008 Plan of Conservation & Development)*

EAST HAVEN

The Town of East Haven is located on the shoreline, in the central portion of the SCRCOG region. The land use in East Haven consists largely of suburban development with some industrial areas and areas where development is expanding. The Town Center is centered around the Town Hall and commercial development at the corner of Main Street and Hemingway Avenue. Unique attractions in East Haven include Farm River State Park, the Shore Line Trolley Museum, and the East Haven Town Beach.

In 2015, the population of East Haven was 29,104, and two percent of the workers over the age of 16 did not have access to a motor vehicle. The population density of East Haven was approximately 2,200 persons per square mile. East Haven does not have their own rail station, but the Town is the home of the Tweed New Haven Airport, and a major bus hub exists in East Haven along Foxon Road.

Sandpiper Restaurant on the corner of Coe Avenue & Cosey Beach Avenue *(Image credit: Only In Your State)*

Recent Accomplishments

The planned Shoreline Greenway Trail extends the entire length of the East Haven shoreline. Through Town, the Shoreline Greenway Trail is an east-west multiuse trail for both bicyclists and pedestrians running parallel to Route 337 (Silver Sands Road). The portion of the trail, extending from DC Moore School to Bradford Avenue has been designed, and a 0.3-mile section of the Shoreline Greenway Trail (Farm River State Park Trail) in East Haven was constructed in 2016.

Issues and Concerns

East Haven's 2007 POCD acknowledges that pedestrian conditions are poor and aesthetics are lacking along Main Street. The Town recently implemented a policy requiring sidewalks to be installed on at least one side of all collector and arterial streets. Where development is more intensive, there are to be sidewalks on both sides of the street.

The POCD also recognizes that bicycle connectivity along High Street, the Farm River, and the shoreline are lacking.

The crash analysis performed in Chapter V revealed two areas where bicycle and pedestrian crashes were concentrated. These two areas are at the intersection of Kimberly Avenue with Forbes Place and also along Foxon Road from the western Town line to Strong Street. East Haven's POCD also listed

the following locations as having significantly high crash rates:

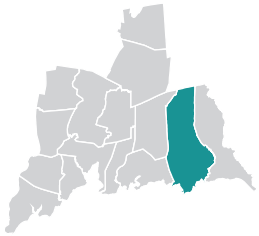
- Intersection of Route 80 (Foxon Road) and Green Street
- Intersection of Route 80 (Foxon Road) and Mill Street
- Along Route 80 (Foxon Road) between Mill Street and Pleasant Avenue

Looking Ahead

East Haven is focused on the continued design and construction of the Shoreline Greenway Trail in the coming years. This will help to facilitate east-west bicycle and pedestrian travel across the Town, and allow access to the waterfront area.

The Town would also like to improve the safety at the intersections listed above and reduce overall crashes in East Haven.

Open Space Plan that illustrates location of needed Greenway *(Image credit: East Haven 2007 Plan of Conservation and Development)*



GUILFORD

The Town of Guilford is located on the shoreline, on the eastern side of the SCRCOG region. The land use in Guilford consists mostly of rural, wooded conservation areas with small suburban communities located towards the shoreline. The Town Center is centered around the Town Hall, Town Green, and the commercial development along Whitfield Street and Broad Street. Some of the unique attractions in Guilford include the Hyland House Museum, Falkner Island Lighthouse, and Jacobs Beach.

In 2015, the population Guilford was 22,392 and less than one percent of the workers over the age of 16 did not have access to a motor vehicle. The population density of Guilford was relatively low, approximately 450 persons per square mile. Guilford has a rail station that provides service to the Shoreline East Commuter train.

Streetscape along Whitfield Street *(Image credit: Only In Your State)*

Recent Accomplishments

The planned Shoreline Greenway Trail will traverse along the entire length of the shoreline in Guilford. The Shoreline Greenway Trail advocacy group is working in partnership with the Town of Guilford to facilitate the the installation of shared lane markings on Whitfield Street between the Town Center and the harbor. These markings, also known as sharrows, are funded with a grant from The Guilford Foundation.

A bikeway has been planned by the Town to extend along Long Hill Road from the Guilford High School to the Town Center. This bikeway is expected to be completed in the near future.

The *Draft 2017 Statewide Plan Update* identifies an on-road north-south bicycle network route along local roads that runs through the Guilford along State Street, Little Meadow Road, South Hoop Pole Road, Hoop Pole Road, and Lake Drive. This route, and its future promotion will encourage more bicycle travel through the Town.

The Connecticut Shoreline Bike & Boat Tour in Guilford *(Image credit: Trip Advisore)*

On-going Concerns

Guilford's 2015 POCD states that pedestrian and bicyclist safety and connectivity are the primary concerns of the Guilford residents. There is particular need for sidewalks around the Town Center / town green area and along Route 1 (Boston Post Road). There is a need for a bicycle facility that would connect the Guilford High School to the Town Center. In addition, the POCD states that the Shoreline Greenway Trail is a much-needed east-west pathway to facilitate bicycle and pedestrian travel in the Town.

Guilford's 2003 Transportation Plan lists several locations throughout the Town where sidewalks are lacking, including River Street from Route 1 to Water Street, numerous locations along Route 1, and State Street just south of the I-95 overpass.

The 2006 *Guilford Village Walking Study* concluded that a pedestrian walkway from the Guilford Green to the train station is desperately needed. This link is critical for the facilitation of the movement of non-motorized traffic in and out of the Town Center. A map of the proposed route is shown on the following page.

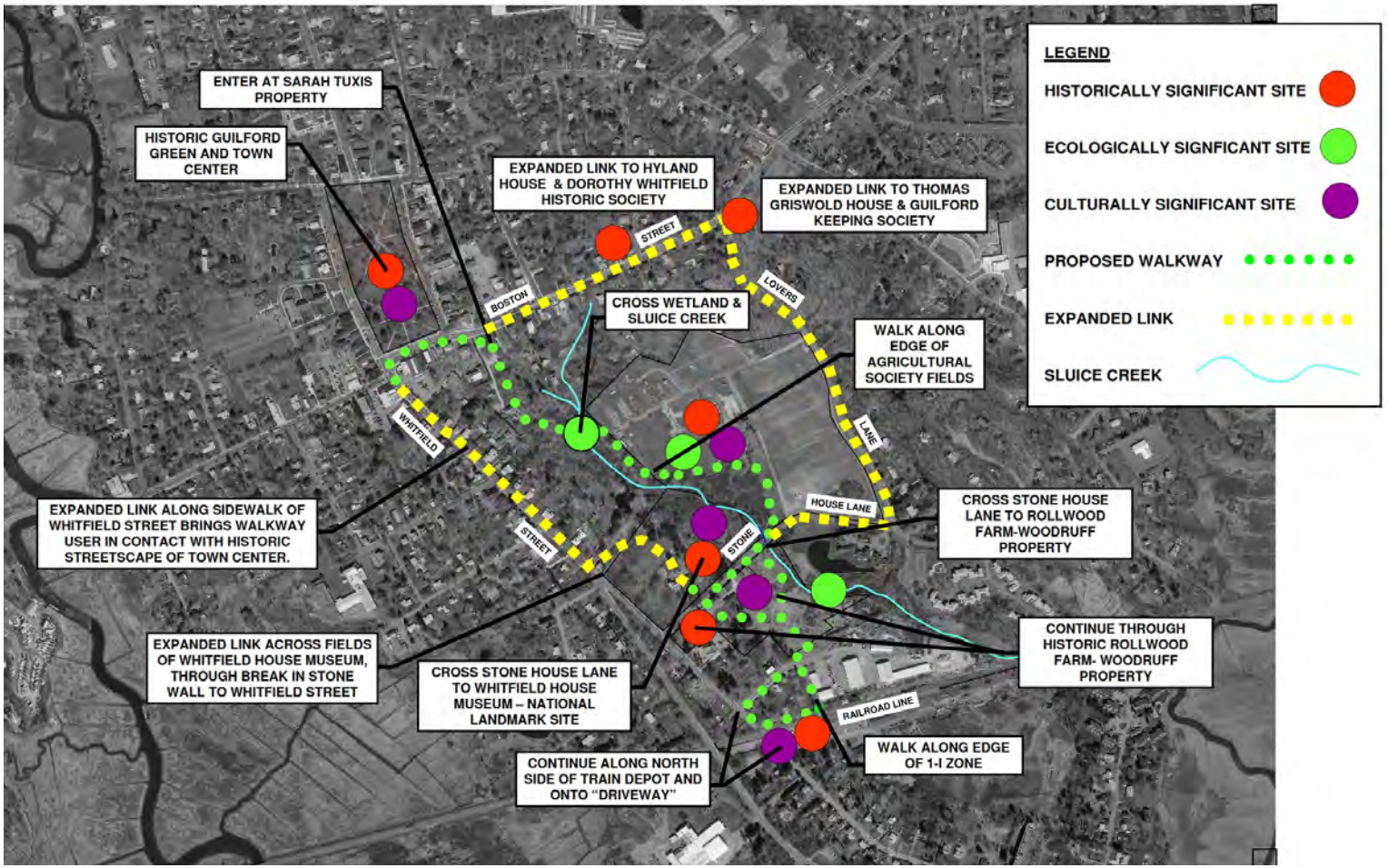
The crash analysis conducted in Chapter V revealed that bicycle and pedestrian crashes in Guilford were concentrated along Route 1, near the intersection with Tanner Marsh Road. This intersection is also close to where bicyclists traveling on Route 146 (a designated

bicycle route that is heavily used by bicyclists) intersect with Route 1.

Looking Ahead

There is a strong desire for sidewalk improvements along Route 1. Improvements, such as bump outs, medians, and traffic circles, to intersections in this area are also supported. These features will help to slow vehicular traffic and improve walking and biking conditions in the area.

Guilford residents strongly desire bicycle facilities separated from roadways. There is also interest in the construction and the completion of the Shoreline Greenway Trail. Second to the completion of the Shoreline Greenway Trail, Guilford supports the continued development and design of the Long Hill Bikeway. This will provide Guilford High School students with a safe and direct connection to the Town Center.



Guilford Village Walkway Proposed Route *(Image credit: 2006 Guilford Village Walking Study)*

HAMDEN

The Town of Hamden is located inland, in the northwest portion of the SCRCOG region. The land use in Hamden has an approximately equal mix of conservation / wooded areas to suburban development near the New Haven area. The Town Center is centered around the Town Hall, Lake Whitney, and the commercial development along Dixwell Avenue, south of Skiff Street. Some of the unique attractions in Hamden include Sleeping Giant Park, East Rock Park, the Eli Whitney Museum, and Lake Whitney.

In 2015, the population of Hamden was 61,523, and three percent of the workers over the age of 16 did not have access to a motor vehicle. The population density of Hamden was approximately 1850 persons per square mile. Hamden does not have a rail station, but there is a major bus transit hub at Dixwell Center.

Recent Accomplishments

The Farmington Canal Heritage Trail has been completed in Hamden and it provides a much-needed north-south route, exclusively for pedestrians and bicyclists. The Farmington Canal Heritage Trail in Hamden is fully paved, and runs across the entire Town, parallel to state route 10 (Dixwell Avenue / Whitney Avenue) from the Cheshire line to the New Haven line. The trail is a portion of the East Coast Greenway.

An amendment to the Town of Hamden POCD was made in 2009, highlighting the Town's desire to focus on improving connections from Dixwell Avenue to the Farmington Canal Line. It also displays specific potential redesign streetscapes for Route 10 (Whitney Avenue and Dixwell Avenue). The redesign would involve lane width reductions, sidewalk improvements, street tree additions, and reduction of block sizes. These changes will not only improve pedestrian and bicycle safety and access, but will also greatly improve the aesthetics of the infrastructure in the area.

On-going Concerns

The *2004 POCD* identified the following north-south routes as having inadequate and unsafe crossings for pedestrians and large gaps in the sidewalk network:

- Route 10 (Dixwell Avenue), particularly from Skiff Street to the Route 15 overpass
- Route 10 (Whitney Avenue)
- Route 5 (State Street)

There is a concentration of crashes on Route 5 and Route 10, as identified in the crash analysis conducted in Chapter V.

Because vehicular traffic is increasing along these north-south routes, traffic has begun to spillover to major east-west routes in the Town. The Hamden East-West Transportation

Hepburn Road *(Image credit: Trulia)*

Whitney Avenue *(Image credit: Coldwell Banker Homes)*

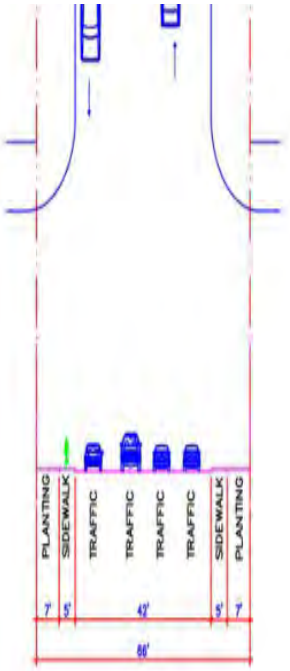
Peter Villano Park *(Image credit: Newhall Neighborhood Remediation, website by Connecticut Department of Energy and Environmental Protection)*

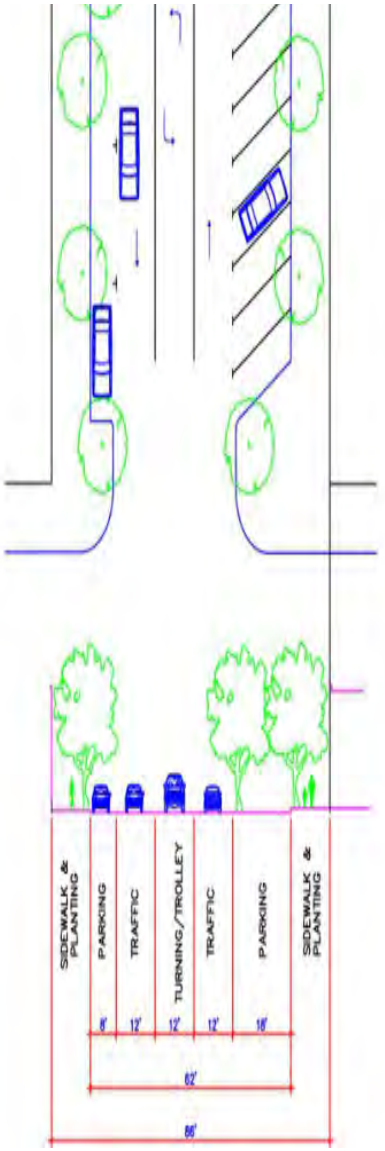
Study was conducted in 2012 in order to address the concerns of heavy traffic on east-west routes. This report identified several streets for crosswalk, bike lane, and sidewalk improvements. In particular, the residents cite Putnam Avenue, Treadwell Street, and Waite Street as streets of major concern.

The *2017 Draft Statewide Plan Update* identified Route 5 as an on-road bicycle network route. Because of this, the deficiencies along Route 5 are even more pressing. The *2017 Draft Statewide Plan Update* also identifies Mount Carmel Avenue in Hamden as a local roadway that could potentially provide a connection for bicyclists between the Farmington Canal Trail and the Quinnipiac River Trail in Wallingford.

Looking Ahead

Route 5 and Route 10 are the primary north-south travel corridors within the Town. Hamden has identified the improvements to these two routes in numerous reports. The improvement of these corridors will lead to a great improvement in safety, access, and aesthetics in the area.





Excerpt from Possible Thoroughfare Refinements to Whitney Avenue (south of SR40 and Dixwell Avenue
(Image credit: 2009 Approved Amendment to the 2004 Hamden Plan of Conservation and Development)

MADISON

The Town of Madison is located on the shoreline, on the eastern side of the SCRCOG region. The land use in Madison consists mostly of rural areas, open spaces, and wooded conservation areas. Suburban development is mainly concentrated towards the shoreline of Madison. The Town Center is centered around the commercial development along Boston Post Road and Wall Street in the southern portion of the Town. Some of the unique attractions in Madison include Hammonasset Beach State Park, Meigs Point Nature Center, the Madison Green, East and West Wharf Beaches, The Surf Club, the Madison Beach Hotel, and the Rockland Preserve mountain bike trail system.

In 2015, the population in Madison was 18,259, and one percent of the workers over the age of 16 did not have access to a motor vehicle. The population density of Madison was approximately 500 persons per square mile, which is lower for the region. Madison has a rail station that provides service to the Shoreline East commuter trains.

Main Street *(Image credit: Town of Madison, Connecticut Website)*

Recent Accomplishments

Some portions of the Shoreline Greenway Trail, which would provide bicyclists and pedestrians with an off-road east-west route across the Town, have been completed in Madison. The trail between Hammonasset Beach State Park and Webster Point Road has been completed, while the remainder of the Town's route is still in the planning or design stage.

On-going Concerns

The 2013 POCD highlighted the lack of bicycle and pedestrian network connectivity as the Town's principle issue. Also highlighted is the need and desire to improve connectivity around the Town Center and within a ½ mile radius of the train station.

Madison Center *(Image credit: Town of Madison, Connecticut Website)*

In addition to these areas, the Town recognizes that sidewalk conditions along Route 1 (Boston Post Road) are not ideal. The sections of Boston Post Road identified as having poor sidewalk conditions are from the western Town line with Guilford to just east of Green Acres Drive and also from Hammonasset Connector to the eastern Town line with Clinton.

The POCD also identifies the following areas where bicycle improvements are most needed:

- Route 79 (Durham Road) from Hunters Trail to Forest Road
- Route 1 (Boston Post Road) from Hammonasset Connector to Dudley Lane
- Route 1 (Boston Post Road) from West Old Post Road to Wildwood Avenue
- Route 450 (Duck Hole Road) from Five Field Road to New Road

The crash analysis conducted in Chapter V revealed that bicycle and pedestrian crashes were concentrated along the entire length of Boston Post Road.

The *2017 Draft Statewide Plan Update* identifies Route 1 (Boston Post Road) from the Hammonasset Connector to the eastern

Town line of Madison as an on-street bicycle network route, which extends into Clinton.

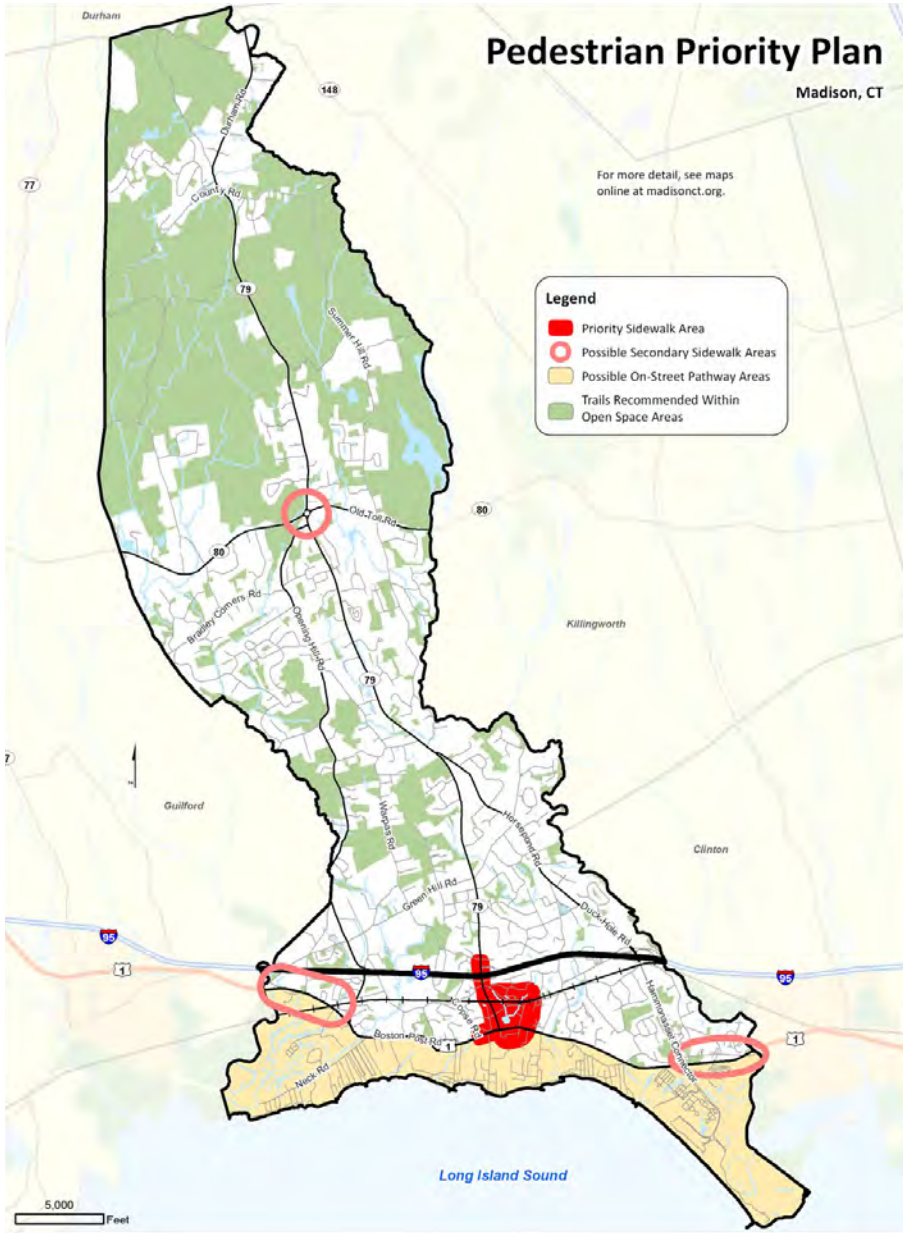
Strava data for Madison suggests that Route 1 is used heavily by bicyclists. This is largely because there are few other east-west routes for bicyclists in the southern portion of the Town. High current bicycle ridership makes improvements to bicycle conditions along Route 1 even more necessary.

Looking Ahead

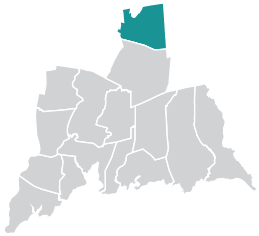
The Town's top priorities are to improve bicycle and pedestrian travel and safety along Route 1 as well as to improve connectivity around the Town Center and train station. Bicycle and pedestrian improvements along this roadway should focus on the segments that are in and around the Town Center and those that are within a half-mile radius of the train station.

The Town would also prefer to have all state highways and major roads that are identified as bikeways to have bikeway markings in the shoulder. Route 1 would fall into this category. On local roadways that are to be designated as bikeways, the Town desires sharrow markings.

Madison is also interested in continuing to design and construct the Shoreline Greenway Trail. The completion of this trail will provide a safe east-west bicycle and pedestrian connection across the southern portion of the Town.



Pedestrian Priority Plan *(Image credit: Madison 2013 Plan of Conservation and Development)*



MERIDEN

The Town of Meriden is located inland, on the northernmost tip of the SCRCOG region. The land use in Meriden consists mostly of suburban development, and has a dense urban center. The Town Center is centered around the Town Hall, and the commercial development along West Main Street. Some of the unique attractions in Meriden include Castle Craig, Chauncey Peak, and Hubbard Park.

In 2015, the population of Meriden was 60,439. Four percent of the workers over the age of 16 did not have access to a motor vehicle, one of the higher percentages in the region. The population density of Meriden was approximately 2,500 persons per square mile. Meriden has a rail station that provides access to Amtrak trains. This rail station also provides access to numerous busses.

Bilger Farm on Westfield Road in Meriden *(Image credit: My Record Journal)*

Meriden also has an airport; the Meriden Markham Municipal Airport.

Recent Accomplishments

Since 2007, Meriden has improved a small segment of West Main Street, along West Main Street from Randolph Avenue to North Second Street. Crosswalks and curb ramps that are compliant with Americans with Disabilities Act (ADA) standards have been installed at all of the intersections.

The Quinnipiac River Trail has been constructed from the Cheshire Town line to Hanover Park. This trail is planned to extend south to the Wallingford Town line, and provide access to the future Quinnipiac River Trail there. This will provide eventual access to the southern shoreline.

In addition, Meriden has constructed a small segment of a trail called the Harbor Brook Trail. This trail will eventually connect the Quinnipiac River Trail from Hanover Pond to downtown Meriden, near West Main Street. The portion of the trail that has been constructed extends from approximately Hanover Pond to Bronson Avenue Park.

On-going Concerns

Per the 2009 POCD, Meriden is primarily concerned with the visual appearance and vitality of their Town. Improvements to pedestrian and bicycle infrastructure across the Town are highly desired, to create more aesthetically pleasing places.

The POCD notes that along Route 71 (West Main Street) from Broad Street to Cook Avenue is an area where improvements to pedestrian conditions are needed. The Town feels that the general appearance and feel of this section of roadway is discontinuous with the recently developed section of roadway to the west, along West Main Street from Cook Avenue to North Second Street.

The crash analysis conducted in Chapter V of this report revealed that bicycle and pedestrian crashes in Meriden were concentrated along Route 71 (West Main Street) from Vine Street to Cook Avenue and also at the intersection of Route 71 (West Main Street) with Linsley Avenue.

An RSA was conducted in Meriden in June 2016, along the Camp Street corridor from Colony Street to Pratt Street. The Town requested an RSA for this roadway because it would like to improve the roadway's bicycle and pedestrian conditions. Along this segment, the sidewalk conditions are poor, numerous pedestrian signals are outdated, and there are few shoulders that are wide enough for bicyclists. Camp Street was not, however, identified in Chapter V of this report as one of the streets with a high concentration of bicycle and pedestrian crashes.

Looking Ahead

Meriden supports improvements to bicycle and pedestrian conditions along the segment of roadway which were found to have a high concentration of bicycle and pedestrian crashes. This identified segment is along Route 71 (West Main Street) from Vine Street to Cook Avenue. Safety improvements to this area should be consistent with the Town's overarching goal of improving the visual appearance and vitality of the Town.

Solutions for the Camp Street corridor from Pratt Street to Randolph Avenue supported by Meriden include shoulder lanes, repairing sidewalks and crosswalks, and clearing encroaching vegetation on sidewalks to widen the walking space. Long-term improvements include realigning the crosswalks so that they are more perpendicular and shorter, and reconfiguring the intersection of State Street and Camp Street.

In order to improve the mentioned discontinuity along East Main Street, the Town of Meriden would like to create a more unified streetscape along Route 71 (East Main Street) so that the planned / recently installed curbs, sidewalks, and pavement along West Main Street (from North Second Street to Cook Avenue) is continuous.

Another interest includes the completion of the Quinnipiac River Trail, in order to provide bicyclists and pedestrians with access to Wallingford, and eventually to the southern shoreline of the State. The trail still needs completion from Hanover Pond to the Wallingford Town line. Following the completion of the Quinnipiac River Trail, another interest is the completion of the Harbor Brook Trail. This trail will provide an important connection from downtown Meriden to Bronson Avenue Park to Hanover Pond, and to the Quinnipiac River Trail. The trail still needs completion from Bronson Avenue Park to West Main Street.

Carriage Drive East *(Image credit: My Record Journal)*

Meriden Train Station *(Image credit: Subway Nut)*

MILFORD

The Town of Milford is located on the shoreline, on the southwestern side of the SCRCOG region. The land use in Milford consists mostly of suburban development. The Town Center is centered around the commercial development along River Street / Factory Lane and also Wilcox Park. Some of the unique attractions in Milford include Silver Sands State Park, Charles Island, Gulf Beach, and Walnut Beach.

In 2015, the population in Milford was 53,206, and one percent of the workers over the age of 16 did not have access to a motor vehicle. The population density of Milford was approximately 2,040 persons per square mile. Milford has a rail station that provides service to the Metro-North railroad. There is also a major bus transit hub at the Connecticut Post Mall in Milford.

Orange Avenue *(Image credit: Connecticut Post)*

Recent Accomplishments

Milford has designated one on-street bicycle lane that extends along North Street from Route 1 (Boston Post Road) to the Orange Town line.

The Savin Rock Trail has been planned to extend across Milford from the Stratford Town line to the West Haven Town line. The trail will facilitate east-west travel for bicyclists and pedestrians across the Town, and also provide access to the waterfront area in the Town. The Savin Rock Trail is planned to be a portion of the East Coast Greenway, which will ultimately be a pedestrian and bicyclist trail that runs from Maine to Florida. The Town is working closely with East Coast Greenway staff to complete the section running through Milford, with the goal of closing a major gap in the East Coast Greenway. The extension of the Savin Rock Trail will connect to a portion of the Merritt Parkway Trail that has already been constructed in the northwest portion of the Town. The Merritt Parkway Trail extends west of the Milford Parkway / Merritt Parkway interchange. The Merritt Parkway Trail runs parallel to the Merritt Parkway into Stratford.

The *2017 Draft Statewide Plan Update* identified the potential extension of the Housatonic Riverbelt Greenway Trail as a feasible north-south off-road trail for pedestrians and bicyclists. The trail would run along the western edge of the Milford Town line, and provide connections to the Merritt Parkway Trail.

On-going Concerns

Milford's 2012 POCD stated that bicycle conditions along all state routes, such as Route 1, Route 736, Route 121, and Route 162 are poor, and in need of improvement. Bicycle connections from all bus stops throughout the Town to the train station are also lacking. The POCD also notes that pedestrian connections are severely lacking on the streets that lead directly to the Town Center and streets that are within the immediate vicinity of schools. For example, Jonathan Law High School is located within 1,000 feet of Route 1 (Bridgeport Avenue).

An RSA was conducted in Milford in July 2016 for Boston Post Road, Cherry Street, River Street, and Broad Street. All of these roadway segments were identified by the Town as places where there is a need to and a potential to significantly improve bicycle and pedestrian conditions. Principle issues in the area include the following:

- Pedestrians departing buses often cross wide roads mid-block without crosswalks
- Guardrails on center medians that give drivers the sense of being on a highway and discourage pedestrian travel
- Long crosswalks at intersections
- Narrow sidewalks

There were several intersections along Route 1 (Boston Post Road) that were listed in the

RSA as particular areas of concern, and having particular pedestrian and bicycle deficiencies. The intersections cited in the RSA are as follows:

- Boston Post Road and Red Bush Lane
- Boston Post Road and Turnpike Square Driveway
- Boston Post Road and Home Acres Avenue

The crash analysis conducted in Chapter V of this report revealed that bicycle and pedestrian crashes in the Milford were concentrated along the entire length of Route 1 (Boston Post Road / Bridgeport Avenue).

The *2017 Draft Statewide Plan Update* has identified Route 1 (Bridgeport Avenue) as an on-road bicycle network route. Because of this, the deficiencies along Route 1 are even more pressing.

Looking Ahead

Improving bicycle and pedestrian conditions along Route 1 (Boston Post Road / Bridgeport Avenue) is a top priority for Milford. Several specific recommendations for improving Route 1 are proposed within the RSA. The recommendations are as follows:

- Add striping / crosswalks along Route 1 (Boston Post Road / Bridgeport Avenue) at I-95 on / off ramps
- Relocate the bus stop that is currently near the East Town Road / Boston Post Road intersection
- Upgrade the crosswalks / pedestrian signals at Turnpike Square / Boston Post Road intersection
- Improve landscaping along Boston Post Road
- Reduce parking requirements for businesses along Boston Post Road, so that roadways are not lined with parking lots

These recommendations parallel the expressed desire of the Town, within the POCD, to implement Complete Street designs around the Town Center and around schools and to install bike lanes on roadways from existing bus stops to the train station.

Also important to Milford is the Savin Rock Trail (a segment of the East Coast Greenway). The completion of this trail should be a priority. There is currently a gap in the East Coast Greenway between West Haven and Stratford. The completion of the Savin Rock Trail will help close this gap, and facilitate bicycle and pedestrian travel from Maine to Florida.

Students walking from Meadowside Elementary School in Milford *(Image credit: CT Post)*

Pedestrians along sidewalk in Milford *(Image credit: WTNH Connecticut News)*

NEW HAVEN

The City of New Haven is located on the shoreline, in the central portion of the region. The land use consists mostly of a dense urban center with suburban development on the surrounding areas. The City center is centered around the New Haven Green, the surrounding commercial and residential development, and Yale University. Some of the unique attractions in New Haven include the Yale University Art Gallery, East Rock Park, the Shubert Theatre, Fort Nathan Hale and the New Haven Green.

The 2015 population in New Haven was 130,612. Fifteen percent of the workers over the age of 16 did not have access to a motor vehicle, the highest in the region. The population density of New Haven was approximately 6,500 persons per square mile; the highest in the region. New Haven has two rail stations that provide service to Shoreline East commuter trains, Amtrak trains, and also Metro-North railroad trains. The rail stations are also major bus transit hubs and New Haven will be the southern terminus of the New Haven–Hartford–Springfield commuter rail line, with service beginning in January 2018.

Recent Accomplishments

New Haven has installed numerous bike lanes, sharrows, and unmarked bicycle-friendly routes throughout the City. The map on the following page highlights New Haven's on-street facilities. Additionally, In May 2017, the City completed the 1.1 mile Long Wharf Drive Cycle Track, the first parking protected cycle track in Connecticut. The 2.5-mile Downtown West / Edgewood Avenue cycle track was approved in June 2017, with construction planned for Fall 2017.

The City has completed Phase 1 of the Downtown Crossing / Route 34 East conversion program, with Phase 2 nearing final design completion as of the summer of 2017. This program will transform a section of Route 34 East in the downtown area from a highway stub to a multimodal city street that encourages slow vehicular speeds with a primary goal to encourage a livable, walkable community while providing local and regional connectivity.

A number of trails have been completed, which are listed below:

- The Farmington Canal Trail: This runs parallel to Dixwell Avenue from the Hamden Town line to Hillhouse Avenue.
- The Vision Trail: This currently runs between the Oak Street Connector and Long Wharf Park
- The West River Greenway Trail: This connects West Rock, Edgewood, and West River Parks through a series of on-road crossings

New Haven is also planning the Harborside Trail. This trail will run parallel to I-95 and provide access to downtown New Haven. It would be part of the East Coast Greenway and the Shoreline Greenway Trail.

In addition to the installation of numerous bike routes throughout the City, there have been extensive educational efforts to promote and encourage safe bicycle riding. The City's website offers numerous resources for bicyclists of all levels. New Haven is also in the process of developing a bikeshare program throughout the City where residents could rent bikes at various stations, and return them at others on opposite side of the City.

New Haven has also developed a *New Haven Complete Streets Manual*, adopted in September 2010. The manual states that all new development that may affect the public must give priority to pedestrians, bicyclists, and transit users. There are a vast array of different traffic calming techniques described in the manual, which can be applied to various street typologies to greatly improve the bicycle and pedestrian environment.

On-going Concerns

The principal concerns with in the City of New Haven are bicyclist and pedestrian safety. Also of importance to the City are connectivity and accessibility to sustainable transportation. These concerns are expressed in *Vision 2025*, the City's Comprehensive Plan of Development that was approved in 2015.

In addition, New Haven realizes that, while quite extensive, there are still several gaps within the existing trail system. The trail that is still in need of completion is the Harborside Trail. New Haven recently received funding to extend the trail from the intersection of Long Wharf Drive, Water and East Street, east across the Tomlinson bridge and to the East Shore.

The completion of the Harborside Trail will provide connections to the future Shoreline Greenway Trail and to the Farmington Canal Trail.

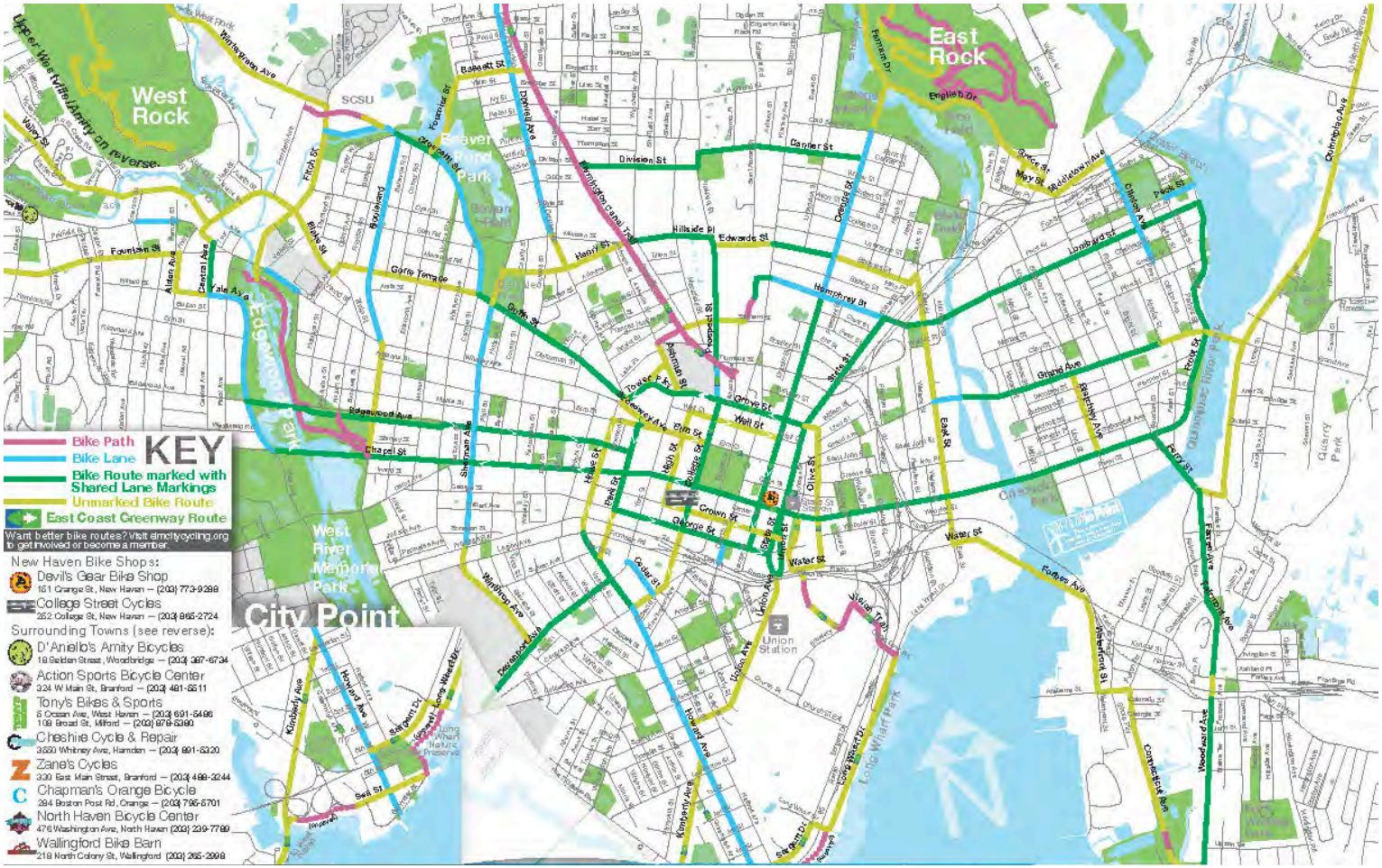
The crash analysis conducted in Chapter V of this report revealed several areas where bicycle and pedestrian crashes are concentrated within New Haven. The identified areas are as follows:

- Intersection of Route 10 (Ella T Grasso Boulevard) and Whalley Avenue
- Route 80 (Foxon Boulevard) from Eastern Street to Quinnipiac Avenue
- Route 63 (Whalley Avenue) from the Liberty Bank Driveway to Davis Street
- Route 1 (Church Street / Union Avenue from Columbus Avenue to Oak Street Connector

Looking Ahead

A top priority in New Haven is bicycle and pedestrian safety. The City will continue to implement traffic calming measures along roadways throughout the City In order to improve pedestrian and bicyclist safety and the general environment. Improvements are under construction along the Clinton Avenue corridor, with 2017 improvements scheduled for the Howard Avenue and Edgewood Avenue corridors. The City is also finalizing the plans for Phase 4 of the Farmington Canal Trail to connect Hillhouse Avenue with the recently completed cycle Brewery Street / Canal Dock Road cycle track connection to Long Wharf.

Another top priority for New Haven is the continuation and completion of the Harborside Tail. This will provide much-needed connections to both the Shoreline Greenway and to the Farmington Canal Heritage Trail.



Bicycle Routes within New Haven *(Image credit: Elm City Cycling)*

NORTH BRANFORD

The Town of North Branford is located inland, in the central portion of the SCRCOG region. The land use in North Branford consists largely of wooded conservation areas and open space. Suburban development can also be found throughout this municipality. The Town Center is centered around a small area of commercial development near the intersection of Foxon Road and Branford Road, south of Lake Gaillard. North Branford also contains Northford Center, also known as Northford Center Historic District, which is a historic district on the National Register of Historic Places. Some of the unique attractions in North Branford include Northford Park and Totoket Valley Park.

The 2015 population of North Branford was 14,354, and one percent of the workers over the age of 16 did not have access to a motor vehicle. The population density of North Branford was approximately 540 persons per square mile, relatively low for the region. North Branford does not have a rail station.

Recent Accomplishments

The *2017 Draft Statewide Plan Update* has identified Reeds Gap Road West as on-street bicycle network route in North Branford. Reeds Gap Road West is a local roadway that extends from just after the Northford Park into Wallingford.

Northford Congregational Church *(Image credit: Jerry Dougherty via Wikipedia)*

On-going Concerns

The principal issue area within North Branford is around the Northford Center. North Branford's 2009 POCD states that better pedestrian access, and the installation of sidewalks are necessary here. A more village-like feel to the center, and an improvement of general aesthetics is also noted as being needed in this area.

Sidewalks are also lacking, and aesthetics are poor along Route 80 (Foxon Road) within North Branford. This route was identified within the POCD as the primary east-west route across the Town. Due to the volume and speed of traffic along this state highway, it is very challenging to make this a safe route for pedestrians and cyclists.

Route 17 was found to be of particular concern to bicyclists, who have expressed that there is insufficient lighting along this roadway.

The crash analysis performed in this report revealed that there have been very few pedestrian and bicycle crashes that have occurred in North Branford. This is largely a result of the fewer numbers of bicyclists and pedestrians using the streets of North Branford. The lower crash numbers, however, should not infer that the roads in North Branford are safer than in other municipalities.

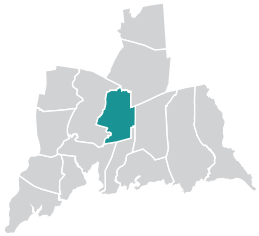
Looking Ahead

North Branford priorities to improve bicycle and pedestrian conditions fall within the vicinity of Northford Center. Sidewalks are needed on streets here to facilitate pedestrian travel. Mixed use buildings with their frontage close to the roadway edges could also help improve the overall pedestrian environment. In addition, mixed use buildings would help create the village-like feel that North Branford desires.

According to the Town's 2009 POCD the highest priority for the installation of sidewalks along the Route 80 corridor is within the vicinity of North Branford Center, particularly from the intersection of Route 22 southwest towards the railroad overpass. As part of its updated POCD for 2019 the Town will look closely at the feasibility of sidewalks and bike lanes in and around its Town Centers of North Branford and Northford.

Looking east along Routes 22 and 80 in North Branford *(Image credit: Kurumi Connecticut Roads)*

Northford Center Plan from the Route 22 Corridor Planning Study *(Image credit: North Brandford 2009 Plan of Conservation and Development)*



NORTH HAVEN

The Town of North Haven is located inland, in the central portion of the SCRCOG region. Land use in North Haven consists largely of suburban development with some small conservation areas of open space and woodlands. The Town Center is centered around the Town Hall and the town green. Some of the unique attractions in North Haven include the Quinnipiac River State Park, Wharton Brook State Park, and Peters Rock Park.

The 2015 population of North Haven was 23,937, and one percent of the workers over the age of 16 did not have access to a motor vehicle. The population density of North Haven was approximately 1130 persons per square mile. North Haven has a planned rail station that would provide access to the New Haven-Hartford-Springfield line.

Recent Accomplishments

Two designated bicycle routes run through the Town: Route 17 and Hartford Turnpike. Additionally, a new train station is planned in North Haven. The station will provide service to the New Haven-Hartford-Springfield (NHHS) rail line. The station is planned to be built at 45 Devine Street. Service is expected to begin in 2018.

The *2017 Draft Statewide Plan Update* has identified two state routes as on-street bicycle network routes. These include Route 5 (State Street / Clintonville Road / Washington Avenue) and Route 17 (Middletown Avenue). Route 5 provides bicyclists a north-south route from the southern portion of Hamden to Wallingford and Route 17 provides bicyclists a north-south route from the northern portion of New Haven into the western portion of North Branford.

Hartford Turnpike Designated Bike Route *(Image credit: North Haven Plan of Conservation and Development 2017-2027)*

On-going Concerns

The principal concern for North Haven, per the 2017 POCD, is the lack of connections between municipal parking lots and the surrounding streets and buildings. Improving these connections will help more people access the Town Center and its amenities.

Another issue reported is the lack of connections to the Quinnipiac River Trail that runs through a portion of Wallingford. Providing a connection to this trail from North Haven is essential for the facilitation of bicycle and pedestrian travel to and from the north. A plan for an extension of the Quinnipiac River Trail into North Haven has not yet been developed.

The POCD recognizes the deficiencies for bicyclists along the Hartford Turnpike, a designated bicycle route. The deficiencies on this roadway heighten the need for the Quinnipiac River Trail in North Haven in order to provide a safe and easy travel path for bicyclists in the Town.

The crash analysis conducted in Chapter V of this report revealed that bicycle and pedestrian crashes within North Haven were concentrated along Route 22 (Clintonville Road) from Fieldstone Court to the North Branford Town line.

Looking Ahead

In order to improve pedestrian connections within the Town, the *1998 SCRCOG Transportation Enhancement Report* recommends that improvements be made which would reinforce the Town Green and nearby municipal buildings as North Haven's core. With this, pedestrian travel within the central area of the Town will be further encouraged. Examples of pedestrian connection improvements include installation of sidewalks, crosswalks, and potentially, pedestrian crossing islands.

A multi-use trail that connects to the Quinnipiac River Trail is also desired. The eventual completion of such a trail will provide a north-south route for bicyclists in North Haven.

With the future construction of a train station in North Haven, careful consideration to pedestrian and bicycle connections within a half-mile radius of the train station is very important. Pedestrian and bicycle-friendly development will be essential for the sustainable access to the station.

Site of the former Amtrak station and future Hartford Line station *(Image credit: Wikipedia)*

Quinnipiac Linear Trail in Wallingford *(Image credit: Trip Buzz)*

Transportation Plan: Pedestrian & Bicycle *(Image credit: Berkshire Hathaway Home Services)*

ORANGE

The Town of Orange is located inland, in the southwest portion of the SCRCOG region. Land use in Orange consists mostly of suburban development on the side that borders West Haven, and rural wooded areas on the side that borders Shelton. The Town Center is centered around the Town Hall, and other municipal buildings along Orange Center Road. Some of the unique attractions in Orange include the PEZ Visitor Center, the Wepawaug Conservation, and the Housatonic Overlook.

The 2015 population of Orange was 13,946, and one percent of the workers over the age of 16 did not have access to a motor vehicle. The population density of Orange was approximately 800 persons per square mile. Orange does not have a rail station at this time.

Recent Accomplishments

The idea for a train station in Orange has been discussed for over a decade in the Town. With a significant amount of community support, plans are finally in place to turn that idea into a reality. Orange has been identified for a planned regional rail station on the Metro-North Railroad New Haven Line. It will be located at Marsh Hill Road and a new access road. The station is expected to open for operation in the fall of 2021. This station will present the opportunity and need to strengthen bicycle and pedestrian connections in the surrounding area.

On-going Concerns

Within the Town's *2015 POCD*, it is stated that numerous residents feel that the appearance and function of the commercial area within the Town needs to be improved. There is a strong desire to upgrade design of Route 1 (Boston Post Road), and create areas with a better sense of place. The Town recognizes that Boston Post Road is not hospitable for pedestrians. There are a large number of access driveways along this roadway which create an unnecessary amount of turning conflicts. The *2015 POCD* states that there is also concern that the rural character of the Town could be disrupted with future development. In particular, Orange is concerned that the rural aesthetics of Route 34 (Derby Avenue) could be disturbed.

The crash analysis conducted in Chapter V of this report revealed that bicycle and pedestrian crashes within Orange were concentrated along Route 1 (Boston Post Road). The concentration of bicycle and pedestrian crashes along this roadway, and the Town's pre-existing concern with this area make Route 1 (Boston Post Road), particularly near the center of Town, the primary issue in Orange.

Looking Ahead

In addition to plans associated with the area surrounding the location of the planned train station, Orange has identified a number of bicycle and pedestrian improvements in its *2015 POCD*. It identifies specific corridors

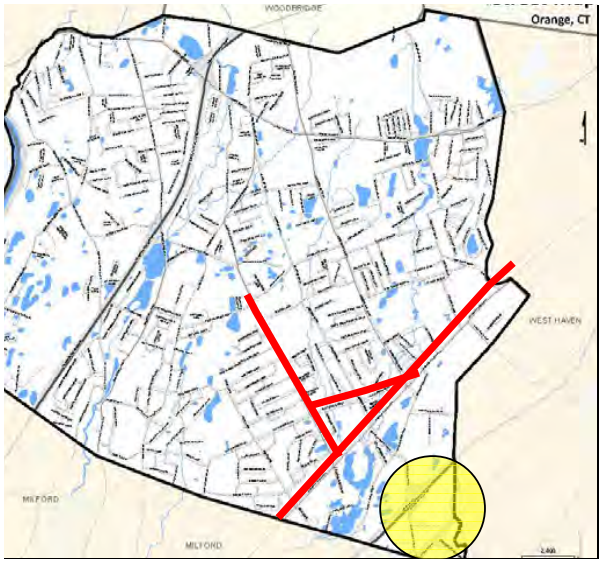
Woodland Trail *(Image credit: Orange 2015 Plan of Conservation and Development)*

Paved Greenway Trail *(Image credit: Orange 2015 Plan of Conservation and Development)*

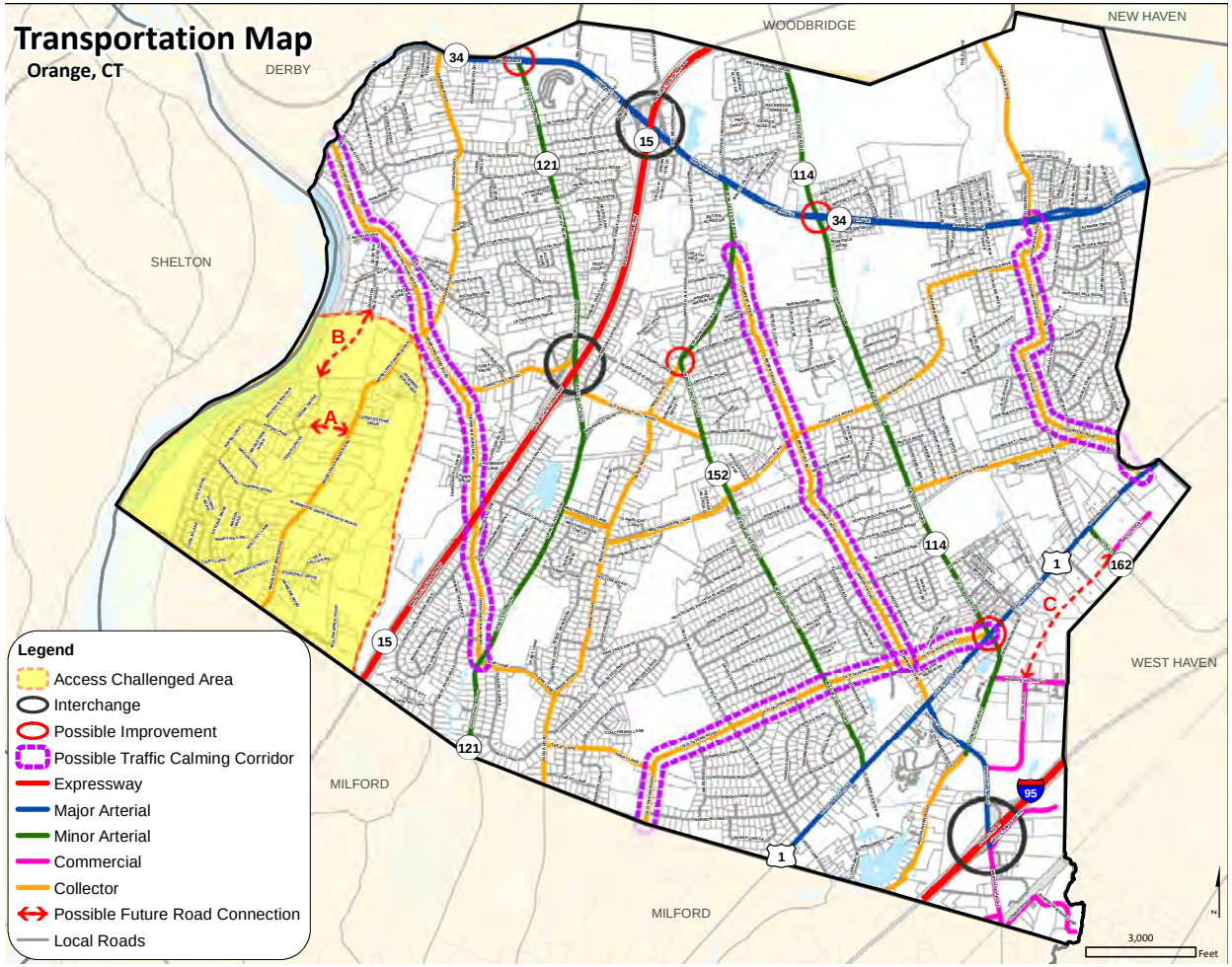
where traffic calming techniques could potentially be applied. Its *2015 POCD* also lists potential traffic calming techniques that are focused on improving education and enforcement to improve safety for bicyclists and pedestrians.

The Town also specifies a number of areas where sidewalks could potentially be added to create a pedestrian network. These areas include: along both sides of Route 1, from Route 1 to Old Tavern Road, and from the Orange Town Center to High Plains Center. The addition of sidewalks in these areas will not only improve pedestrian connections and access, but will also help improve pedestrian safety. Route 1 (Boston Post Road) in particular is a top priority for improving bicycle and pedestrian conditions.

Lastly, the Town hopes to establish a committee comprised of local cyclists to develop a system of bicycle routes on local streets that builds off the bicycle network defined in the *2017 Draft Statewide Plan Update*. Orange also hopes to pursue designation as a bicycle friendly community by the American League of Cyclists.



Possible Sidewalk System *(Image credit: Orange 2015 Plan of Conservation and Development)*



Transportation Map *(Image credit: Orange 2015 Plan of Conservation and Development)*

WALLINGFORD

The Town of Wallingford is located inland, on the northern portion of the SCRCOG region. Land use in Wallingford consists of a wide mix of development types from suburban development to open spaces to conservation areas, and woodlands. The Town Center is centered around the commercial development along South Colony Road / North Colony Road / Old Colony Road. Some of the unique attractions in Wallingford include the Gouveia Vineyard, the Paradise Hills Vineyard, and the Nehemiah Royce House and Museum.

The 2015 population in Wallingford was 45,089, and two percent of the workers over the age of 16 did not have access to a motor vehicle. The population density of Wallingford was approximately 1,130 persons per square mile. Wallingford has a rail station that provides service to Amtrak trains.

Recent Accomplishments

The planned Quinnipiac River Trail will extend across the entire Town of Wallingford from the southern Town line with North Haven to the northern Town line with Meriden. The trail with be an off-road multiuse pathway that will facilitate north-south bicycle and pedestrian travel across the Town. Approximately two miles of this trail has already been constructed. The trail currently runs parallel to the Wilbur Cross Parkway from Lakeside Park northward to approximately the northern end of the Emerson Leonard Wildlife Area. It then crosses under then Wilbur Cross Parkway, and extends northward to Fireworks Island in Wallingford.

Signage about the history of Wallingford *(Image credit: Coldwell Banker Homes)*

On-going Concerns

The 2016 POCD state that gaps in the pedestrian and bicycle networks in Wallingford are the primary concern. One of the primary issues within the Town is the lack of, or poor condition of, pedestrian and bicycle connections between the commuter rail platforms and the existing Town Center. The Town believes that North Colony Road (Route 5) and North Cherry Street are the ideal roadways for pedestrians to use to make this connection, but recognizes that the streets need improvement. Currently, there are significant gaps in the sidewalk network along North Colony Street. Several locations also lack crosswalks.

The crash analysis conducted in Chapter V of this report revealed that bicycle and pedestrian crashes in Wallingford were concentrated along Route 5 (South / North Colony Road) from Parsons Street to Church Street. These crash findings, compounded with the recognition in the POCD that these roadways have deficiencies, make South / North Colony road the primary issue within the Town.

The *2017 Draft Statewide Plan Update* has identified Route 5 (South Colony Road) from the southern Wallingford Town line to Route 150 (Hall Avenue) as an on-road bicycle network route. The fact that this roadway has also has seen a significant number of bicycle and pedestrian crashes, greatly increases the need for improvements along this corridor.

Looking Ahead

Wallingford's priority to improve bicycle and pedestrian conditions along roadways focuses on the improvement of Route 5 (North / South Colony Road). Improving pedestrian connections along North Colony Street will make the Wallingford Town Center a more vibrant destination, and improve the quality and variety of transportation options with the Town of Wallingford, which are desired goals of the Town. Per the POCD, the Town would like to partner with local employers in the area to incentivize carpooling. This initiative would help encourage the continued improvement of bicycle and pedestrian infrastructure within the Town. Improving the conditions for bicyclists and pedestrians on South Colony Road will also provide better access to the Quinnipiac River Trail from the southern Wallingford Town line bordered with North Haven.

Wallingford also supports the completion of the Quinnipiac River Trail. The completion of this trail will facilitate north-south bicycle and pedestrian travel through the Town, and provide access to the Town of Meriden.

Wallingford CT Clinic Ride & Wine Tour *(Image credit: Bike Trex)*

Downtown Wallingford *(Image credit: Flickr user MadMark455)*

WEST HAVEN

The Town of West Haven is located on the shoreline, on the western side of the SCRCOG region. Land use in West Haven consists mostly of a dense urban core towards the side of Town that is closest to New Haven and has suburban development on the southwestern side of Town. The Town Center is centered around the Town Hall, the West Haven Green, and the commercial development along Campbell Avenue. Some of the unique attractions in West Haven include the Savin Rock Amusement Park Museum, Bradley Point Park, Oak Street Beach, the Maltby Lakes, and Morse Park.

The 2015 population in West Haven was 55,189. Four percent of the workers over the age of 16 did not have access to a motor vehicle, high for the region. The population density of West Haven was approximately 5,020 persons per square mile. West Haven has a rail station that provides service to the Metro-North Railroad system. The area surrounding the West Haven green is a major transit bus hub.

Recent Accomplishments

The Savin Rock Trail has been fully planned to pass through West Haven along the shoreline. The Savin Rock Trail has already been constructed from the southern portion of Bradley Point Park to the Sandy Point Bird Sanctuary. The trail is planned to extend westerly into and across the Town of Milford once it is completed. It will eventually provide access to the Merritt Parkway Trail, Shoreline Greenway Trail, and the Farmington Canal Heritage Trail. It is also planned to extend northerly to sidewalks along 1st Avenue.

West Haven has also developed a conceptual plan to utilize Marginal Drive (a paper road) as a future multiuse bicycle and pedestrian facility. Marginal Drive runs parallel to West River Memorial Park. It would provide a north-south connection between Route 1 (Boston Post Road) and Route 34 (Derby Avenue). At the northern end, this pathway would connect with trails that begin around the Yale Campus, which are part of the East Coast Greenway.

There are also conceptual plans to develop a bicycle and pedestrian path along the eastern shoreline as a part of the "Haven Project." The Haven Project is planned to include multiuse commercial developments at the property that is just south of Elm Street, and just east of Water Street.

Also since 2007, West Haven has also constructed a train station which is serviced by Metro-North trains.

On-going Concerns

The 2017 Draft POCD for the Town of West Haven acknowledges that there are significant gaps in the sidewalk network that need to be addressed. The Draft POCD specifically

Corner of Main St and Campbell Ave *(Image credit: Wikipedia)*

Savin Rock Boardwalk *(Image credit: Connecticut Explorer)*

mentions that the gaps in the sidewalk network along Route 1 (Boston Post Road) is of concern to a large number of the residents in the Town.

The crash analysis conducted in Chapter V of this report revealed that bicycle and pedestrian crashes in West Haven were concentrated on three main roadways, on the eastern part of Town. These roadways were Elm Street, Route 122 (1st Avenue / Campbell Avenue), and Boston Post Road. Route 1 (Boston Post Road) was already identified by the Town as a roadway that is in need of sidewalk improvements, therefore this thoroughfare is the primary issue within the Town.

Looking Ahead

West Haven's priorities include improvements to bicycle and pedestrian conditions on Route 1 (Boston Post Road). Additionally, the Town is seeking to improve multi-modal facilities on roadways that connect to the train station and to create a more bicycle and pedestrian friendly area surrounding the station area.

Another interest within the Town is to extend the Savin Rock Trail southerly into the City of Milford and northerly towards New Haven. This extension will allow for the future connection to the Merritt Parkway Trail, which is a portion of the East Coast Greenway in Milford. The completed East Coast Greenway will provide a safe and efficient multiuse trail from Maine to Florida.

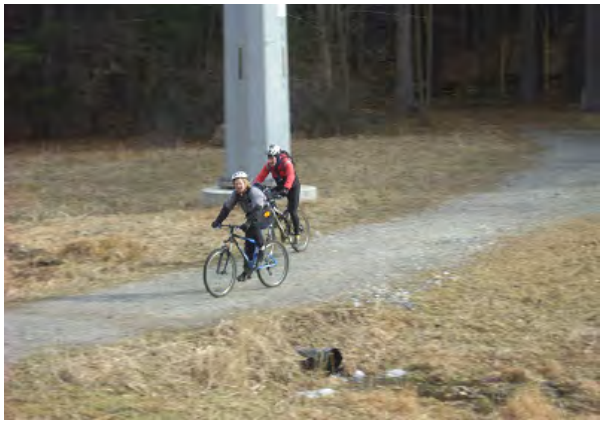
The photo simulation (bottom image) depicts how the look and feel of a commercial corridor (top image) like Route 1 could be reshaped by changing the way buildings, facades, signs, and parking areas are arranged.

Photo Simulation of Route 1 *(Image credit: West Haven 2017 Draft Plan of Conservation & Development)*

WOODBRIDGE

The Town of Woodbridge is located inland, on the western side of the SCRCOG region. Land use in Woodbridge consists mostly of rural, wooded areas. The Town Center is centered around the Town Hall and other municipal buildings along Center Road. Two of the unique attractions in Woodbridge are Alice Newton Street Memorial Park and the Darling House Museum.

The 2015 population in Woodbridge was 8,939, the second lowest in the region. One percent of the workers over the age of 16 did not have access to a vehicle. The population density of Woodbridge was approximately 470 persons per square mile. Woodbridge does not have a rail station, nor does it have a major transit bus hub.



Red Trail *(Image credit: Central Connecticut Chapter of the New England Mountain Bike Association)*

On-going Concerns

Within their 2015 POCD, Woodbridge recognized that the number of sidewalks in the town are minimal. Per the POCD, the Town views the business district and the immediate vicinity around the schools as the areas where sidewalks are most needed. The POCD cited significant gaps in the sidewalk network within the Town's business district.

Bicyclists have expressed that they do not feel safe riding on the state routes that run through Woodbridge such as Route 63, 67, and 69. Bicyclists on these roadways use the shoulder lanes, which vary greatly in their width.

An RSA was conducted in the Town of Woodbridge in July 2016. The RSA report focuses on analyzing bicycle and pedestrian conditions in the Woodbridge business district. This included Selden Street, Bank Street, Lucy Street, Litchfield Turnpike, Bradley Road, and Amity Road. These streets were identified as having high traffic volumes with high vehicle speeds, along with a high density of businesses. Sidewalks on all of these routes were identified in the report as being discontinuous, which forces pedestrians to use the shoulders in many places. There are also a limited number of places where pedestrians can cross with crosswalks.

Red Trail *(Image credit: Central Connecticut Chapter of the New England Mountain Bike Association)*

The crash analysis conducted in Chapter V of this report revealed that there have been relatively very few bicycle and pedestrian crashes that have occurred in Woodbridge. This is largely a result of the fewer numbers of bicyclists and pedestrians using the streets of Woodbridge. The lower crash numbers, however, should not infer that the roads in Woodbridge are safer than in other municipalities.

Recent Accomplishments

Since the previous *2007 Regional Plan* was written, the town has installed sidewalks in numerous locations across the town. The area in the town where the most sidewalks have been installed in much of the area between the more mountainous (western) part of town and West Rock. The Town's goals are to provide sidewalk linkages to / from key destinations throughout the Town, such as between the Town Center and the schools and within the business district.

Looking Ahead

The Town supports the RSA recommendations, which include several short-term and long-term ideas for the improvement of these roadways. Short-term recommendations include relocating CT Transit bus stop locations so that pedestrians do not have to cross mid-block, removing the encroaching vegetation along Lucy Street to help widen the sidewalk, and modifying the landscaping on the center island near the Woodbridge Gathering Restaurant. Long-term recommendations include reducing the vehicle lane widths on Bank Street to make room for five-foot wide sidewalks on either side of the road, installing a sidewalk on the west side of Amity Road, and restriping Litchfield Turnpike and Amity Road to have 11-foot vehicle lanes.

The Town would also like to include bike facilities as part of scheduled maintenance and install bike lanes on the following state roadways:

- Route 63 (Amity Road)
- Route 67 (Seymour Road)
- Route 69 (Litchfield Turnpike)
- Route 114 (Center Road)
- Route 243 (Ansonia Road)
- Route 313 (Rimmon Road)

Increasing the amount of pedestrian and bicycle traffic throughout the town could have many benefits to the town, including improvements to the economy, aesthetics, and overall attraction to non-residents.

Community Group Ride *(Image credit: Congregation B'nai Jacob)*

Amity Bike Shop in Woodbridge *(Image credit: Hamden Patch)*

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Chapter V
SAFETY & CRASH ANALYSIS

From the initial planning phase of the *Regional Plan Update*, safety emerged as a primary concern and consideration within all of the municipalities for any improvement project. To address this, a thorough analysis of the bicycle and pedestrian crashes was conducted and is described in this chapter.

A. Methodology

Due to the strong desire in all SCRCOG region municipalities, and to provide data-driven recommendations, an analysis of bicycle and pedestrian crashes in the SCRCOG region was undertaken. It is important to understand that bicycle and pedestrian crashes were only recorded, and thereby analyzed, if there was also a vehicle involved in the crash and there was a police report filled out. Crashes where only a bicycle and pedestrian collided or bicycles crashed independently were not recorded or evaluated.

Bicycle and pedestrian crash records were obtained for the years of 2012-2015 from the Connecticut Crash Data Repository. Crashes on U.S. Routes and state routes were analyzed for the years of 2012-2014. Crashes on U.S. Routes, state routes, and local roads were analyzed for the year of 2015. Crashes on local roadways were able to be analyzed for the year of 2015 due to new mapping technologies that were introduced. Crash records included information such as the location of crash, date / time, contributing factor, and weather. The crash records did not include detailed information outlining the specific sequence of events that led to the crash.

The crashes were mapped in a Geographical Information System (GIS). Within the GIS, the intent of the analysis was to determine where concentrations of crashes had occurred. From there, a further analysis was conducted to investigate why crashes might be occurring at this location. The ultimate goal was to devise a solution that could mitigate or prevent crashes from happening at these locations in the future.

In order to provide a holistic analysis, the crashes were analyzed by municipality, instead of looking at the SCRCOG region as a whole. With this, municipalities that were smaller in size / population and had fewer bicycle and pedestrian crashes were still analyzed in the same level of detail. Areas were flagged to be significant crash location / areas of interest if either more than one crash occurred in the same general vicinity and appeared to have been of the same type or cause. Some longer corridors were flagged as areas of interest even if the crashes did not appear to be geographically concentrated if it was clear that the crashes were of the same type and the roadway cross-section and design was consistent along the corridor. Locations of fatal crashes were also taken into

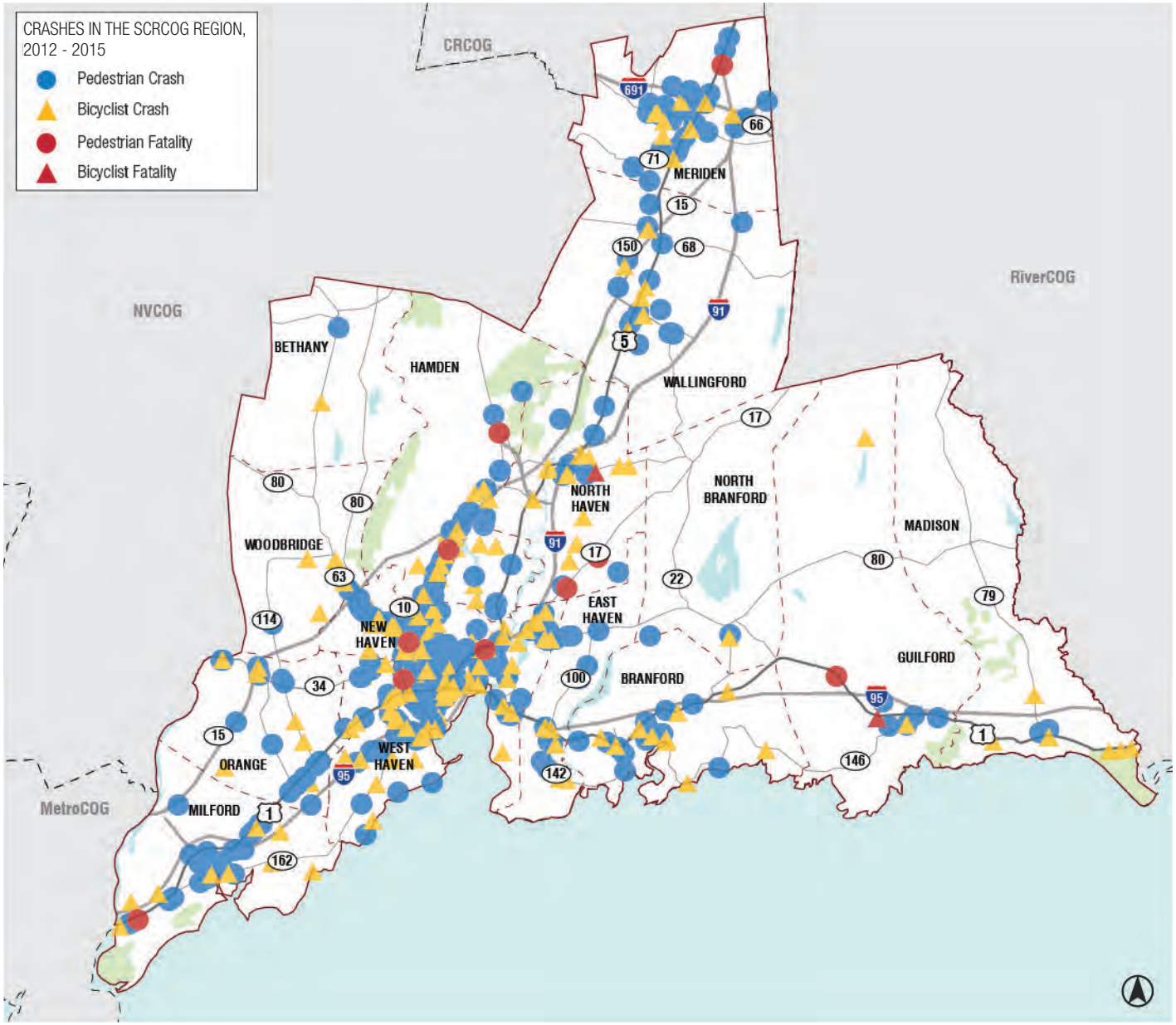
Police officer at a crosswalk near Beecher Road School (BRS) in Woodbridge *(Image credit: Woodbridge School District: Parent Update From Dr. Stella, Superintendent of Schools)*

consideration when flagging crash areas of interest.

B. Findings

The following figure shows where all of the bicycle and pedestrian crashes occurred in 2012-2015.

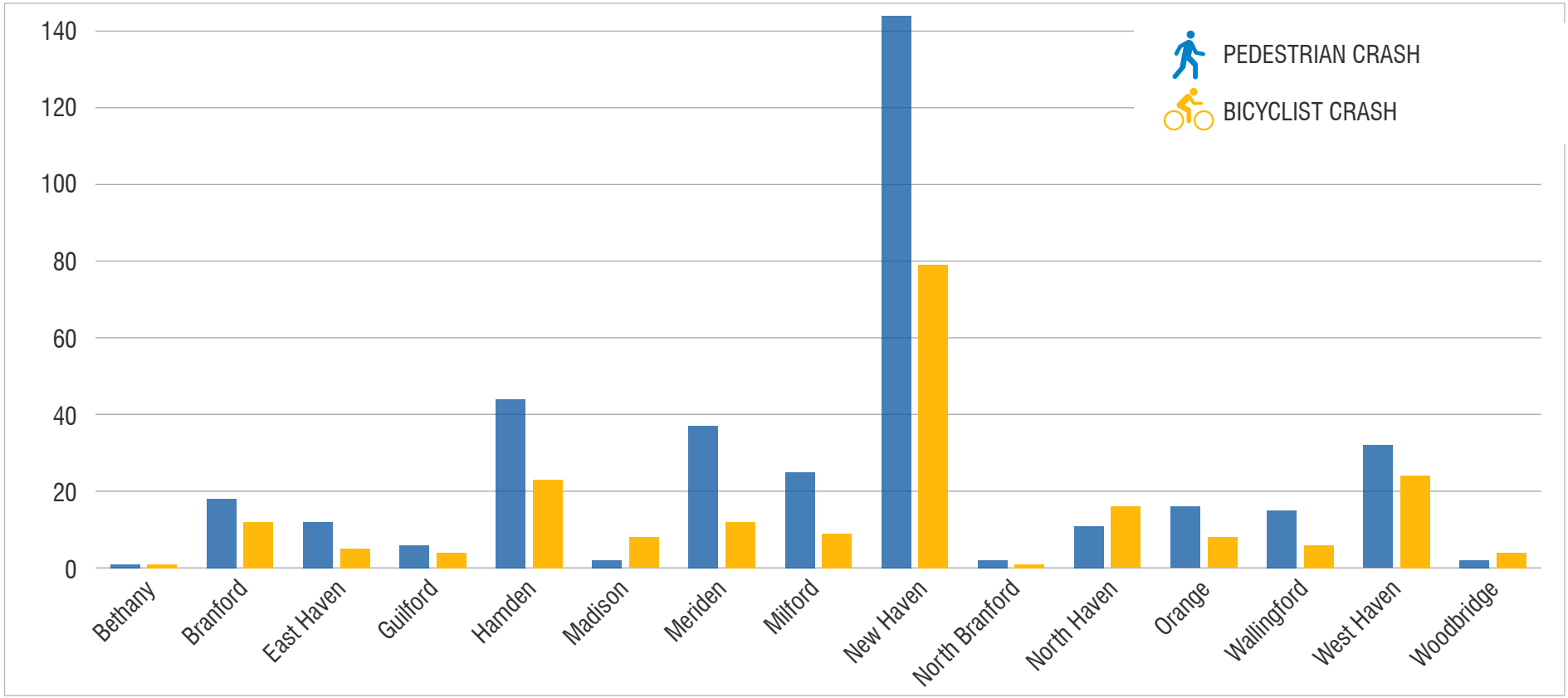
The following bar graph shows the distribution of crashes across each individual town.



Pedestrian and Bicyclist Crashes in the SCRCOG region, 2012 - 2015 *(Source: Fitzgerald & Halliday, Inc.; 2012-2015 Connecticut Crash Data Repository*

As can be seen, the majority of crashes occurred in the more urbanized areas such as Hamden, Meriden, New Haven, and West Haven. It is difficult to know, however, whether these locations had more crashes simply because there were more people walking and biking there or whether there is something uniquely unsafe about the area. Providing an analysis for each municipal in detail provides a greater understanding as to why these crashes occurred.

The findings of the individual municipal assessment are shown below.



Pedestrian and Bicyclist Crashes in the SCRCOG Region, 2012 - 2015 *(Source: Fitzgerald & Halliday, Inc.; 2012-2015 Connecticut Crash Data Repository*

Bethany

From 2012-2015, there was only one crash involving a pedestrian in Bethany. This crash occurred in 2015 on Amity Road near Tuttle Court at approximately 3 PM.

There was also only one crash that involved a bicyclist in Bethany from 2012-2015. This crash also occurred on Amity Road, near Valley road at approximately 3 PM.

The bicycle and pedestrian crash do not appear to be related.

Branford

From 2012-2015, there were 18 pedestrian crashes in Branford. Seven of these crashes occurred along Route 146 (Main Street / Montowese Street) between Kirkham Street and Meadow Street. Much of this street has sidewalks on both sides, frequent crosswalks, and building frontage close to the roadway edge.

Cross-section along Route 146 where pedestrian crashes have occurred *(Image credit: Google Street View)*

Seven pedestrian crashes occurred along Route 1 (West Main Street / North Main Street) from 2012-2015. Seventy-five percent of these crashes occurred between 12 PM and 5 PM, meaning that light conditions likely did not affect the crashes along this corridor. One of these crashes is attributed to freezing rain / icy conditions.

This portion of Route 1 is similar to the design of Route 1 in Milford and Orange. It is a four-lane roadway with no sidewalks. Shoulder widths along this road vary between 1 to 3 feet. Buildings are set back a significant distance from the roadway edge, and the environment is less suitable for pedestrians.

Cross-section along West Main Street *(Image credit: Google Street View)*

There were 12 bicycle crashes between 2012-2015 in Branford. Half of these bicycle crashes occurred along Route 1 (West Main Street / East Main Street) and the other half occurred along Route 146 (Montowese Street). Three of the bicycle crashes occurred within the same 300-foot stretch (from Meadow Street to Pine Orchard Road).

Cross-section of Montowese Street between Meadow Street and Pine Orchard Road *(Image credit: Google Street View)*

East Haven

There were 12 pedestrian crashes across the four-year study period of 2012-2015 in East Haven. The pedestrian crash locations were relatively spread out across the Town, but there were certain areas where clusters of crashes occurred.

The first area of interest is at the intersection of Kimberly Avenue and Forbes Place, where a pedestrian crash occurred in 2014 and a bicycle crash occurred here in 2012. According to the crash record, the pedestrian crash was due to the "driver's view being obstructed" and occurred during daylight hours with no adverse weather conditions. Looking at the intersection from various angles, it's clear that the pedestrians walking on the eastern portion of Kimberly Avenue are out of site from drivers traveling north on Forbes Place. There is also no sidewalk for these pedestrians traveling on this side of Kimberly Avenue. This is of particular concern for pedestrians wishing to cross Kimberly Avenue, like the ones shown in the images below.

Intersection of Kimberly Avenue and Forbes Place - top: looking north; middle: looking southeast; bottom: looking west *(Image credit: Google Street View)*

The second area of interest in East Haven is along Route 80 (Foxon Road). Four pedestrian crashes occurred along Foxon Road between Dell Drive and Hunt Lane. The pedestrian crashes along this segment of roadway are more significant when considering the fact that nine pedestrian crashes also occurred on this route in New Haven, just across the line. There are several areas along Foxon Road where the grass has been worn down, and a dirt trail has been created due to high volumes of pedestrian traffic. Examples of these areas are shown below.

The pedestrian desire path continues along Foxon Road from the East Haven / New Haven line to the location of Monro Muffler & Brake, where an existing sidewalk is present. There are several existing bus stop locations along this roadway.

Worn grass along Foxon Road - top: near Paul Street; bottom: near Foxon Boulevard *(Image credit: Google Street View)*

There were five bicycle crashes in East Haven from 2012-2015. One of the crashes occurred on Kimberly Avenue, two of the crashes occurred on Route 100 (High Street), and the other two crashes occurred on Route 142 (Short Beach Road).

The bicycle crash on Kimberly Avenue (at the intersection of Kimberly Avenue and Forbes Place) occurred at 11 PM, and was a result of the driver failing to adhere to the traffic control. This most likely means that the driver passed a stop-sign at the intersection without stopping completely. This intersection is also the location of two pedestrian crashes. The bicycle crashes do not appear to be related to each other in their location or crash type.

Enhancements near the intersection of Kimberly Avenue and Forbes Place, in addition to Route 80 (Foxon Road), can improve bicycle and pedestrian conditions in these areas. At the intersection of Kimberly Avenue and Forbes Place, a sidewalk can improve safety along the eastern side of Kimberly Avenue. Removal of some of the shrubbery on the southeast corner of the intersection can also increase pedestrian visibility.

Along Route 80 (Foxon Road), a sidewalk installed on the northern side of the roadway from Dell Street to just east of South Dale Street can enhance safety From the worn-down grass / dirt along the roadway, there is a large amount of pedestrian traffic here and a high demand for a sidewalk.

Guilford

From 2012 to 2015, there were six crashes involving a pedestrian in Guilford. One of these crashes resulted in a fatality. This fatal crash occurred at the intersection of U.S. Route 1 (Boston Post Road) and Flag Marsh Road at approximately 4 AM. The driver was under the influence at the time of the fatal crash.

Two of the other crashes occurred along U.S. Route 1 (Boston Post Road). One crash occurred near the entrance to McDonald's restaurant at approximately 5:30 PM. The other occurred near the intersection of Boston Post Road and Tanner Marsh Road at 6 PM. This intersection is close to an existing bus stop. The pedestrian crash near this bus stop occurred during dark conditions, while the pedestrian was walking in the shoulder. The lack of sidewalks or street lighting on this particular roadway segment is shown in the image below.

U.S. Route 1 (Boston Post Road) near Tanner Marsh Road *(Image credit: Google Street View)*

There were four bicycle crashes from 2012-2015, one of which was fatal. This fatal crash occurred on U.S. Route 1 (Boston Post Road) near its intersection with York Street. This crash occurred at 9 AM in 2014, and was attributed to the driver losing control. Another bicycle crash occurred along Church Street south of the I-95 North on-ramp at 10 AM at a location where pedestrian-related crashes also occurred.

While there was a pedestrian crash and a bicycle crash that occurred in nearly the same location, the two crashes do not appear to be related. The pedestrian crash involved a construction worker who was in a marked work zone. Two fatalities (one pedestrian and one bicycle) occurred along Route 1 in 2014 in Guilford. The installation of more sidewalks and street lighting along Boston Post Road can improve safety, especially at locations in close proximity to public transit stops.

Hamden

There were 44 pedestrian crashes in Hamden from 2012-2015. Twenty-seven of these crashes occurred along Route 10 (Dixwell Avenue / Whitney Avenue), with the majority on the southern portion (Dixwell Avenue).

Both of the two fatal pedestrian crashes that occurred in Hamden during this three-year period were along Route 10. The first fatal crash was in 2012 along Route 10 (Whitney Avenue) just south of Home Place at approximately 10 PM. The driver in this first fatal crash was under the influence. The second fatal crash occurred in 2014 at the intersection of Route 10 (Dixwell Avenue) and Haig Street at approximately 8 PM. The crash record does not indicate any contributing factor or adverse weather condition for this second fatal crash. An image of this second fatal crash location is shown to the left.

Intersection of Dixwell Avenue and Haig Street *(Image credit: Google Street View)*

Another non-fatal pedestrian crash occurred just across the road from this pedestrian crash, at the intersection of Route 10 (Dixwell Avenue) and Hillcrest Avenue in 2013 at approximately 6 PM. This crash was attributed to unsafe use of roadway by the pedestrian. Hillcrest Avenue is located directly adjacent to Haig Street.

Intersection of Dixwell Avenue and Arch Street *(Image credit: Google Street View)*

There are several other areas along Route 10 (Dixwell Avenue) where clusters of pedestrian crashes have occurred. Four pedestrian crashes occurred near the intersection of Dixwell Avenue and Arch Street, shown in the image to the left. Two of the crashes occurred at approximately 1 PM and the other two crashes occurred at approximately 9 PM.

Crossing distances at this intersection are between 70-80 feet. The non-standard geometry of this intersection and setback stop lines contribute to the relatively long pedestrian crossing distances and the relatively long distances that vehicles must travel to clear the intersection.

Intersection of Dixwell Avenue and Church Street *(Image credit: Google Street View)*

Seven pedestrian crashes occurred within 1,000 feet of the intersection of Dixwell Avenue with Church Street, shown in the image to the left.

This intersection is representative of much of the southern portion of Route 10. The roadway has four vehicle lanes (two in each direction). Parking on either side of the road is permitted. Careful attention should be paid so that vehicles do not park too close to intersection corners. Parked vehicles can obstruct driver visibility while making turns. There are also no lines on the roadway to indicate the existence of parking. The addition of such lines could visually narrow the roadway to drivers, encouraging lower speeds and increasing the ease for pedestrians entering their vehicles.

Five pedestrian crashes also occurred along a 0.5 mile stretch of Route 5 (State Street) between Ridge Road and Park Road. All five of the pedestrian crashes occurred during daylight (either early morning or mid-afternoon) An image of a typical cross-section of this roadway segment is shown below.

The crash records indicate that the pedestrians involved in the crashes are using the roadway "unsafely." The image below shows a pedestrian using the shoulder lane along this roadway.

There were 23 bicycle crashes in Hamden from 2012-2015. Fourteen of the bicycle crashes occurred along Route 10 (Dixwell Avenue). Twelve of the fourteen crashes occurred during daylight hours. None of the bicycle crashes along this roadway occurred during adverse weather conditions. Nine of these 14 crashes occurred at intersections, while the bicyclist was crossing the roadway. Seven of these 14 crashes were either turning-intersecting path crashes or angle crashes. Improvements for pedestrians at intersections along this roadway previously mentioned could also help improve conditions for bicyclists. Improvements to bicyclist visibility at crossings and reduce vehicle turning speeds can improve safety at these intersections.

Efforts to improve bicycle and pedestrian facilities in Hamden can improve safety along the southern portion of Route 10 (Dixwell Avenue), specifically at the following locations: the intersection of Dixwell Avenue and Hillcrest Avenue, the intersection of Dixwell Avenue and Arch Street, and near the intersection of Dixwell Avenue and Church Street. Improvements to pedestrian and bicycle visibility at crossing points along this roadway could reduce vehicle turning speeds and improve safety. Safety could also be improved with a sidewalk on the western side of Route 5 (State Street) between Ridge Road and Park Road.

Cross-Section of Route 5 (State Street) *(Image credit: Google Street View)*

Madison

From 2012-2015 there were two pedestrian crashes that occurred in Madison. One crash occurred on state route 79 (Durham Road) in 2014 at approximately 5 PM. The other occurred in 2015 along Bradley Road in or around a parking lot at approximately 10 AM. The two pedestrian crashes were unrelated.

There were eight bicycle crashes during the study period of 2012-2015 in Madison. Seven of the eight bicycle crashes occurred along Route 1. Six of the eight bicycle crashes occurred during daylight hours, thus issues with lighting along this route are not likely causing the bicycle crashes. Three of the eight bicycle crashes occurred along Route 1 (Boston Post Road) between Signal Hill Road and Cottage Road. As shown in the cross-section of this section of the road below, there is only 1-2 feet for bicyclists in road's shoulder and no sidewalks for pedestrians. There is also little to no building frontage along the roadway and few access points.

While there are no specific facilities for bicyclists along the Boston Post Road, the majority of bicyclists who use Strava ride along this road when traveling east to west within Madison.

Over the four-year study period, there were very few pedestrian-related crashes. The overwhelming majority of the bicycle crashes, however, occurred along Route 1 (Boston Post Road). Bicycle facilities could improve safety for bicyclists along the Boston Post Road in Madison. Boston Post Road also runs through several other towns in the SCRCOG region so there is a potential for coordination on such safety improvements on this roadway between towns.

Meriden

There were 37 pedestrian crashes in Meriden from 2015-2015. One of these crashes resulted in a fatality in 2012. This fatal crash occurred at 8 PM along U.S. Route 5 (North Broad Street) during dark lighting conditions 30 feet south of Canyon Drive.

There were 11 other pedestrian crashes that also occurred along Route 5 (North Broad Street) during the study period of 2012-2015. Approximately 50 percent of these crashes occurred between 6 PM and 8 PM. The rest occurred during lighted conditions. As shown in the image below, a large portion of this route is lined with residential and small office buildings. Sidewalk widths vary along the roadway.

Cross-section of Route 1 (Boston Post Road) *(Image credit: Google Street View)*

Cross-section of Route 5 (Broad Street) *(Image credit: Google Street View)*

Ten pedestrian crashes also occurred along a 0.5 mile stretch of Route 71 (West Main Street) in Meriden between Vine Street and Cook Avenue. The plan view of West Main Street is shown to the right. The design strategies that were implemented on West Main Street to the east of Cook Avenue are recommended for the western portion of West Main Street to Vine Street as well. Examples of typical cross-sections along West Main Street are shown to the right.

Three of the pedestrian crashes along Route 71 occurred at the intersection of West Main Street and Linsley Avenue in 2014. The time of day for these three crashes varied greatly, but all occurred during lighted conditions. Two of the three crashes at this intersection were attributed to "unsafe use of highway by pedestrian." There are, however, visible crosswalks and pedestrian signals at this intersection. Safety could be improved by determining whether the traffic signal timing at this intersection allows for proper clearance time for pedestrians as well as a the addition of pedestrian crossing islands to reduce the crossing distance.

There were 12 bicycle crashes that occurred over the course of the four-year study period. Two of the bicycle crashes occurred on the same 0.5 mile stretch of roadway where there were 10 pedestrian crashes (along West Main Street between Vine Street and Cook Avenue). Four of the bicycle crashes occurred along Route 5 (Broad Street). There are no notable trends with regards to the time-of-day that these bicycle crashes occurred. Improvements to the bicycle and pedestrian conditions with along this stretch of Route 71 between Vine Street and Cook Avenue could improve safety along this roadway.

Plan view of West Main Street *(Image credit: Google Street View)*

Cross-section of West Main Street in Meriden *(Image credit: Google Street View)*

Cross-section of West Main Street in Meriden near North 3rd Street *(Image credit: Google Street View)*

Intersection of West Main Street & Linsley Avenue *(Image credit: Google Street View)*

Milford

From 2012-2015 there were 25 pedestrian crashes that occurred in Milford. One of these pedestrian crashes resulted in a fatality. This fatal crash occurred in 2013 along Route 1 (Boston Post Road), approximately 50 feet north of Hayes Drive at 11 AM. The crash occurred during the day, during snowy / slushy conditions. There were also 14 other pedestrian crashes that occurred along Route 1 (Boston Post Road / Bridgeport Avenue) in the four-year study period. Approximately 50 percent of the pedestrian crashes that occurred along Route 1 happened between the hours of 6 PM and 9 PM. Typical cross sections of Route 1 (Bridgeport Avenue and Boston Post Road) are shown below.

Much of Route 1 (Bridgeport Avenue) is a four-lane roadway with sidewalks on both sides. Lighting on these sidewalks, however, appears to be limited.

The second image below also illustrates that some of the sidewalks on Bridgeport Avenue are disconnected. Continuation between sidewalk segments or a pedestrian crossing treatments at points like the image shown below can improve safety.

Cross-section of Route 1 (Boston Post Road / Bridgeport Avenue) *(Image credit: Google Street View)*

Abrupt sidewalk ending on Route 1 (Bridgeport Avenue) *(Image credit: Google Street View)*

Intersection of Boston Post Road and East Town Road *(Image credit: Google Street View)*

Three pedestrian crashes occurred along Route 1 at intersections designed like the one shown above, which is located at the intersection of Boston Post Road and East Town Road. The pedestrian crossing distance at the intersection shown above is over 100 feet.

The other intersections, which were similarly sized, were the intersection of Route 1 with the Turnpike Square Exit, and the intersection of Route 1 with the Milford Crossing Entrance.

There were nine bicycle crashes during the four-year study period in Milford. The crashes do not appear to be concentrated in any one area.

Due to the concentration of pedestrian crashes along Route 1 (Boston Post Road / Bridgeport Avenue) in Milford, safety can be improved with potential improvements such as the pedestrian lighting along sidewalks, the reduction in crossing distances for pedestrians at intersections, and higher visibility crosswalks. Building frontage closer to the roadway edges along Route 1 could also help improve pedestrian and bicycle comfort.

There were also several pedestrian crashes that occurred along Route 1 in Orange. The cross section of Route 1 is similar in both Milford and Orange so there is a potential for coordination on such safety improvements on this roadway between towns.

New Haven

Over the four-year study period of 2012-2015 there were 144 pedestrian crashes in New Haven.

Three of these pedestrian crashes resulted in pedestrian fatalities. These three fatal pedestrian crashes all occurred in 2014. Two of the crashes occurred along Route 10 (Ella T Grasso Boulevard / Whalley Avenue). These two crashes were attributed to "the unsafe use of highway by pedestrian." One crash occurred at approximately 10 PM, along Ella T Grasso Boulevard approximately 1,000 feet south of Legion Avenue. The other crash occurred at approximately 12 AM, at the intersection of Ella T Grasso Boulevard and Whalley Avenue. An image of these two locations is shown below.

At this location, there is limited lighting along the roadway. A gravel footpath, approximately one-foot wide, exists on the eastern side of the roadway. On the western side of the roadway there is no shoulder and no sidewalk. A large sports field exists on the western side of the roadway. Pedestrians are likely to be crossing from either side of the roadway here without crosswalks.

Ella T Boulevard, approximately 1000 feet south of Legion Avenue *(Image credit: Google Street View)*

Intersection of Ella T Grasso Boulevard and Whalley Avenue *(Image credit: Google Street View)*

At the intersection of Ella T Grasso Boulevard, there was one fatal pedestrian crash. While this number is not particularly high, the geometry of the intersection is complex and could contribute to crashes. Simplification of the intersection could improve safety by preventing or mitigating the chances of pedestrian crashes occurring here in the future.

Several restaurants, convenience stores, and residential units surround this intersection. As can be seen in the image above, this intersection is relatively large, and the vehicle movement patterns are complex. There are crosswalks at all of the legs of the intersections, but due to the large size of the intersection, it may be difficult for pedestrians to see vehicles at all approaches, and gauge whether traffic has come to a stop.

The third fatal crash occurred at the off-ramp of I-91. The crash that occurred near the I-91 off ramp was due to the driver being under the influence.

There are two other specific areas of interest where a cluster of pedestrian crashes has occurred. The first area of interest is along Route 80 (Foxon Boulevard) between Eastern Street and Quinnipiac Avenue. This stretch of roadway is approximately 1/8 - mile long. There were nine pedestrian crashes here over the four-year study period. One

of these nine pedestrian crashes was due to the driver being under the influence. Three pedestrian crashes occurred in 2013, four occurred in 2014, and two occurred in 2015. Six of these nine crashes occurred between the hours of 8 PM and 10 PM. Three of the crashes occurred at or very near the intersection of Foxon Boulevard and Eastern Street. An image of this intersection is shown below.

The roadway is approximately 60 feet wide with five vehicle travel lanes. Gas stations and fast-food restaurants line this roadway section. Parking lots for these businesses occupy the majority of the area directly beside the roadway. Several pedestrian crashes also occurred along Route 80 (Foxon Boulevard) in the neighboring East Haven.

The second area of interest, where a cluster of pedestrian crashes has occurred in New Haven is along Route 63 (Whalley Avenue) between the Drive to Liberty Bank and Davis Street. This segment of Whalley Avenue is approximately 0.25 miles in length. There were nine pedestrian crashes that occurred on this roadway segment. Six of the nine pedestrian crashes occurred during daylight conditions, which suggests that poor lighting in the area is not the cause of these crashes. The contributing factor for four of the crashes was "unsafe use of highway by pedestrian." In Google street view, a pedestrian can be see crossing the roadway without a crosswalk. This is shown in the image below.

Intersection of Foxon Boulevard and Eastern Street *(Image credit: Google Street View)*

Foxon Boulevard between Eastern Street and Quinnipiac Avenue *(Image credit: Google Street View)*

Sidewalks and a brick buffer zone line either side of the roadway, and encourage pedestrian travel. The roadway has four vehicle lanes that are each approximately 15 feet wide. This creates a significant distance for a pedestrian to cross and encourages high vehicle speeds. There is sufficient space on this roadway for the installation of a center median / pedestrian refuge area, which will improve safety while still providing four vehicle travel lanes. More frequent crosswalks along Whalley Avenue (in the segment mentioned) should also be provided, Since there appears to be a demand for pedestrian crossing along this segment, safety could be improved with a pedestrian crossing.

There were 79 bicycle crashes over the course of the four-year study period of 2012-2015. There are two specific areas of interest where

Whalley Avenue between Davis Street and Drive to Liberty Bank *(Image credit: Google Street View)*

clusters of bicycle crashes have occurred. The first area is along Route 1 (Church Street / Union Avenue) from Columbus Avenue to Oak Street Connector. There were nine bicycle crashes that occurred along this roadway segment. Two of the bicycle crashes here occurred at the intersection of Route 1 (Union Avenue) and Meadow Street. Two of the bicycle crashes also occurred at the intersection of Route 1 (Union Avenue) and Church Street South. These two locations are shown to the right.

As can be seen in the image to the right, this particular intersection is relatively large. Crossing distances are over 100 feet on the longer legs. Bicyclists traveling along Union Avenue are out of sight from vehicles approaching the intersection from Church Street and vice versa. Turning radii here for vehicles are approximately 60 feet, which allows for vehicle turns at high speeds. Efforts to reduce the intersection size and increase bicycle visibility can improve safety.

The most obvious element lacking from the intersection of Union Avenue and Meadow Street is a crosswalk on the third leg of the intersection, across Union Avenue. There is also no curb ramp to enable / encourage pedestrians to cross from the northeast side of the intersection to the northwest. There is, however, a pedestrian signal head provided for pedestrians to cross along this leg. This intersection most likely has an exclusive pedestrian phase.

Intersection of Union Avenue and Church Street *(Image credit: Google Street View)*

Intersection of Union Avenue and Meadow Street *(Image credit: Google Street View)*

North Branford

From 2012-2015 there were two pedestrian crashes that occurred in North Branford. One crash occurred on Route 139 (Branford Road) in 2015 at 8 PM. The other occurred at the intersection of state route 740 (Totoket Road) and Williams Road during rainy conditions at approximately 12:30 PM. These crashes were not related.

There was one bicycle crash that occurred between 2012-2015 in North Branford. This crash occurred on Route 139 (Branford Road) just north of Twin Lakes Road at approximately 12 PM. This is near the location of the pedestrian crash that occurred on Branford Road in 2015.

North Haven

There were 11 pedestrian crashes over the course of the four-year study period of 2012-2015 in North Haven. Two of these pedestrian crashes (one in 2013 and one in 2014) resulted in a fatality. Both fatal pedestrian crashes occurred on Route 17 (Middletown Avenue). Both pedestrian crashes occurred while the driver was under the influence. The other nine pedestrian crashes in North Haven do not appear to have any relation to each other. One of the pedestrian crashes in North Haven occurred on Route 22 (Clintonville Road) just west of West Fallon Drive. This area is shown in the image below. There were four bicycle crashes that also occurred on this roadway.

However, it appears that the Clintonville Road is designed in a contextually appropriate manner for the surrounding land uses. There is a sidewalk on one side of the roadway, and wide shoulders on either side of the road.

Route 22 (Clintonville Road) west of Fallon Drive *(Image credit: Google Street View)*

There were 16 bicycle crashes across the study period of 2012-2015 in the Town of North Haven. One of these bicycle crashes resulted in a fatality. This fatal bicycle crash occurred in 2012 along Route 22 (Clintonville Road), just west of Country Way. The crash was a result of the motorist driving on the wrong side of the road, and occurred at approximately 5 PM under no adverse weather conditions.

As previously mentioned, there were three other bicycle crashes that occurred on Route 22 across the study period. These three crashes along Route 22 occurred at 6 PM, 7 PM, and 11 PM (all during dark conditions). While the segment of Route 22 where the pedestrian crash occurred appears appropriately designed, as one travels further east along Route 22 (east of Fieldstone Court), there are no sidewalks and the shoulder widths are less than 1 foot in some parts. This area along Route 22 is where two of the bicycle crashes in the North Haven occurred. An image of the roadway is shown below.

Safety can be improved in North Haven with pedestrian and bicycle amenities along the eastern portion of Route 22 (Clintonville Road). Such amenities could include sidewalks as well as shoulders that are wide enough for pedestrians and bicyclists to safely use. The installation of these facilities could also create more continuity in design across the entire Clintonville Road thoroughfare in North Haven.

Route 22 (Clintonville Road) east of Fieldstone Court *(Image credit: Google Street View)*

Orange

There were 16 pedestrian crashes from 2012-2015 in Orange. Six of these pedestrian crashes occurred on some portion of Route 1 (Boston Post Road). Four of these six pedestrian crashes occurred in the absence of any adverse conditions (e.g. rain or poor lighting). There is no notable trend in the time of day that these crashes along Boston Post Road occurred. The majority of Route 1 (Boston Post Road) is a four-lane road with no shoulders and no sidewalks. Access driveways to shopping plazas and office buildings line the majority of this roadway. A typical cross-section of Route 1 (Boston Post Road) is shown below.

Two pedestrian crashes occurred along or near Racebrook Road in the Town of Orange. There was also one pedestrian crash along Racebrook Road in Woodbridge. These crashes are not necessarily related, but efforts to improve Racebrook Road in Orange should be coordinated with Woodbridge, and vice versa.

There were eight bicycle crashes in Orange from 2012-2015. The crashes are spread out across the town, and do not appear to be related. One bicycle crash, however, occurred on Route 1 (Boston Post Road), in 2015 while the bicyclist was riding in the shoulder. This crash occurred at 11 AM. There were several pedestrian crashes that also occurred on Route 1.

Safety can be improved in Orange with pedestrian and bicycle amenities along Route 1 (Boston Post Road). There is also potential for Orange to coordinate improvements along Route 1 with Milford, where several pedestrian crashes also occurred along Route 1 (Boston Post Road and Bridgeport Avenue).

Cross-section of Route 1 (Boston Post Road) *(Image credit: Google Street View)*

Wallingford

Over the four-year study period, 2012-2015, there were 15 pedestrian crashes in Wallingford. There is no clear concentrated location or time of day where and when these pedestrian crashes occurred. Four pedestrian crashes have occurred along Route 5 (South / North Colony Road) in Wallingford between Parsons Street and Church Street. Portions of this roadway section have sidewalks for pedestrians, but the sidewalks end abruptly in several areas, such as those shown in the following two images.

***Abrupt sidewalk ending on South** / **North Colony Road** (Image credit: Google Street View)*

The two images in lower left hand side of the page illustrate that the sidewalk ends along the left side of the roadway, and no pedestrian crossing points are in close proximity.

Several places where pedestrians are expected to be crossing along Route 5 (South / North Colony Road) are marked with a pedestrian crossing sign on one side of the roadway, but no crosswalk, and no geometrical change to the roadway cross-section. An example of this is shown at the bottom of the page below.

There were six bicycle crashes over the course of the four-year study period (2012-2015). Only one of the six crashes occurred during dark and rainy conditions. The remaining five bicycle crashes occurred during daylight hours with no adverse weather conditions. Three of these six bicycle crashes occurred along Route 5 (South / North Colony Road) along the same segment as the four pedestrian crashes mentioned above. Besides there being unconnected sidewalks along this roadway segment, there is also no shoulder on the majority of the roadway.

The bicycle and pedestrian crashes in Wallingford over the four-year study period (2012-2015) were relatively spread out through the town. A total of seven pedestrian and bicycle crashes have occurred along the roadway segment mentioned above (North / South Colony Road from Parsons Street to Church Street). While this is a relatively low number of crashes, safety can be improved in Wallingford with amenities for pedestrians and bicyclists along this section of roadway.

***No crosswalk at marked pedestrian crossing on South** / **North Colony Road** (Image credit: Google Street View)*

West Haven

Over the four-year study period of 2012-2015, there were 32 pedestrian crashes. Fourteen of these pedestrian crashes occurred as pedestrians were traveling along Elm Street (between Water Street and 1st Avenue), along Route 122 (between Elm Street and Boston Post Road), along Boston Post Road (between Forest Road and just past Marginal Drive). These three connected roadway segments create a pedestrian route wrapping around large residential areas, Quigley Stadium, and several large shopping complexes in West Haven. The route also passes by several University of New Haven academic buildings. Boston Post Road is also one of the principle entry points to the center of New Haven from West Haven. Only two of the 14 pedestrian crashes occurred under adverse weather conditions. Six of the 14 pedestrian crashes occurred between the hours of 6 PM and 12 AM, during dark lighting conditions. Elm Street and Route 122 both are two-lane roadways with sidewalks on either side. Boston Post Road is a four-lane roadway with sidewalks on either side. Average lane widths are 12 feet on all three roadway segments. Where parking is permitted, outside lane widths are approximately 22 feet. The wide vehicle lanes in some parts, with curbs and painted center lines may be encouraging high vehicle speeds, and may make it more difficult for pedestrians to cross the street safely. An example of this design is shown below.

There are a number of places along Route 122 (1st Avenue) where there are gaps in the sidewalk network like the image shown below. Pedestrians and cyclists traversing these segments of roadway may be diverted towards walking in the roadway instead. These segments are also not likely to be properly cleared at all times in the winter months when there is snow on the ground.

Nine of the 14 pedestrian crashes occurred at intersections. Three of these intersections also had a bicycle crash that occurred there over the four-year study period of 2012-2015. These intersections are shown on the following page.

Sidewalk gap along Route 122 (1st Avenue) *(Image credit: Google Street View)*

Cross-section of Route 122 (1st Avenue) *(Image credit: Google Street View)*

At this intersection, there is a crosswalk for persons wishing to cross Route 1 (Boston Post Road), but there is not one for pedestrians crossing Gilbert Street. There is neither a pedestrian push-button nor a pedestrian signal head for pedestrians on the northeast corner. Pedestrians crossing Gilbert Street are not highly visible to the unaware driver.

Intersection of Boston Post Road with Gilbert Street *(Image credit: Google Street View)*

Intersection of Route 122 (1st Avenue) and Alling Street *(Image credit: Google Street View)*

The intersection of Route 122 (1st Avenue) and Alling Street is a two-way stop intersection. Vehicles traveling along Route 122 are not required to stop. There is, however, a marked pedestrian crossing for pedestrians wishing to cross Route 122 (1st Avenue). This could be creating a potentially unsafe conflict between vehicles traveling southbound on Route 122 and pedestrians crossing the roadway. Pedestrians may feel falsely protected in the crosswalk here, as there are very few features in the intersection design that would indicate to the driver that they should slow down. A zoomed-in image of this situation is shown below.

Another element that likely inhibits safety at this intersection is the lack of a crosswalk across Water Street and across Elm Street. Two existing bus stops are located at the intersection on either side of Elm Street, thus there is a high likelihood that pedestrians will need to cross here. Elm Street also has a dedicated left turn lane that is approximately 400 feet long for vehicles wishing to make a left turn onto 1st Avenue. This left turn lane extends through the intersections of Elm Street and Water Street. Safety can be improved by shortening this turning lane. This would reduce the width of Elm Street at the mentioned intersection, and shorten the pedestrian crossing distance.

Intersection of Route 122 (1st Avenue) and Alling Street, zoomed-in *(Image credit: Google Street View)*

Four pedestrian crashes also occurred along Route 162 (Saw Mill Road) between Hillcrest Avenue and the on / off ramps to Interstate 95. Within this segment, there are no crosswalks for pedestrians wishing to cross Saw Mill Road. Near the intersection with I- 95, a sign indicates that pedestrian crossing is prohibited. There were, however, two pedestrian crashes that occurred near the on / off ramps to I-95 along Saw Mill Road. One of the pedestrian crashes occurred at 200 Saw Mill Road, and was due to a vehicle "unsafely turning right on red." An image of this intersection is shown below.

The outside vehicle lane along this roadway is an extremely wide shoulder. It is not meant for vehicle travel, but could easily be misinterpreted by a driver as being a vehicle lane. It is possible that the vehicle was traveling northwest on Route 162 (Saw Mill Road), utilized the shoulder lane to make a right turn, and did not see a pedestrian crossing along Hillcrest Avenue, where no existing crosswalk is present.

Over the four-year study period of 2012-2015, there were 24 bicycle crashes in West Haven. Thirteen of these 24 bicycle crashes occurred on the same route that was previously mentioned. This route includes a portion of Elm Street, Route 122 (1st Avenue / Campbell Avenue), and Boston Post Road. Twelve of the 13 bicycle crashes occurred at intersections. Five of these 13 crashes occurred between the hours of 1 PM and 4 PM. Three of these intersections were mentioned in the pedestrian section, because there were also pedestrian crashes that occurred at them. The intersections are Elm Street with Water Street, Boston Post Road with Gilbert Street, and 1st Avenue with Alling Street. Safety can be improved at these intersections and it's possible they should be prioritized for bicycle and pedestrian amenities.

Intersection of Elm Street and Water Street in West Haven *(Image credit: Google Street View)*

Abrupt sidewalk ending along Saw Mill Road in West Haven *(Image credit: Google Street View)*

A total of 27 crashes (bicycle and pedestrian combined) occurred on the route mentioned, which includes a portion of Elm Street, Route 122 (1st Avenue / Campbell Avenue), and Boston Post Road. Safety can be improved in West Haven by prioritizing these three roadway segments for pedestrian and bicycle amenities.

Much of this route already has sidewalks. The vehicle lane widths across the area are approximately 12 feet, with extra space for parking. There is good potential for reduction in roadway widths and number of vehicle lanes in order to reduce pedestrian crossing distances. Safety can be improved at these intersections along this roadway, especially the locations mentioned above, by increasing pedestrian and bicycle visibility.

Safety at a small section of Saw Mill Road (from Hillcrest Avenue to Interstate-95) can also be improved. At 200 Saw Mill Road, the shoulder lanes are very wide, and could be confused for a vehicle travel lane by a driver. Potential safety improvements include markings in this shoulder lane to clarify that it is not intended for vehicular travel.

There are also several locations along the roadway where the sidewalks are lacking connection, as with the location shown below. Pedestrians or bicyclists on either side of the road here have no way of crossing safely.

Wide shoulder lane at 200 Saw Mill Road *(Image credit: Google Street View)*

Woodbridge

From 2012-2015 there were two pedestrian crashes that occurred in Woodbridge. These two crashes occurred on Connecticut Route 114 (Racebrook Road) and Route 63 (Amity Road). There is no relation between these two crashes.

Route 114 and Route 63, however, also run through Orange and New Haven, respectively. Crashes have also occurred in Orange and New Haven along these roadways. The geometry of Route 63 changes between Woodbridge and New Haven, thus there is likely no relation to the crashes between these two areas. The geometry of Route 114 (Racebrook Road), however, stays consistent throughout both Woodbridge and Orange. Much of Route 114 is a two-lane road with 2-3 foot shoulders on both sides with no sidewalks. The image below is the location along Racebrook Road, where the pedestrian crash occurred.

There were four crashes involving a bicycle from 2012-2015 in the Town of Woodbridge. Two of these crashes occurred along Route 63 (Amity Road), relatively close to where a pedestrian crash also occurred. The other two bicycle crashes were in isolated locations.

There were a very small number of crashes that occurred in Woodbridge.

There is potential for Woodbridge to coordinate with Orange on any potential safety improvements for state route 114 (Racebrook Road) as well as with New Haven for any improvements for state route 63 (Amity Road).

Route 114 (Racebrook Road) in Woodbridge *(Image credit: Google Street View)*

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Chapter VI
RECOMMENDATIONS

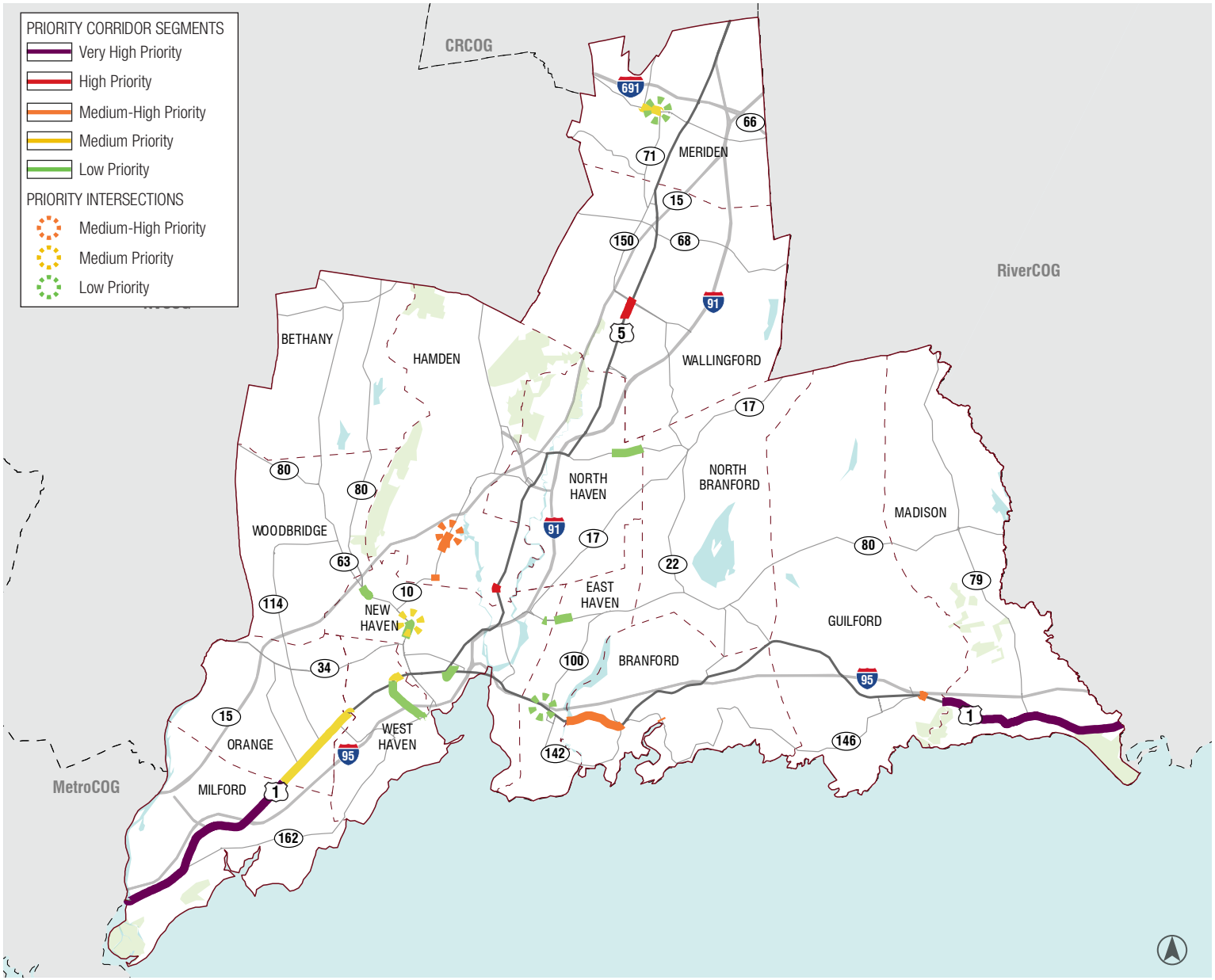
The recommendations are a compilation of the recommendations that are described in the Municipal Overview section of Chapter IV and the Safety and Crash Analysis in Chapter V within this document. The recommendations also include priority off-road routes for bicycling and walking as well as design and policy recommendations that can be implemented for those priority area routes as well as throughout the region. The primary reason to improve the on-road priority corridors and intersections in the region is to improve bicycle and pedestrian safety. The primary reason for completing the off-road trails in the region is to strengthen bicycle and pedestrian connectivity.

A. On-Road Priority Areas

The areas that were identified as having significant concentrations of bicycle and pedestrian crashes throughout the towns and determined to be in need of pedestrian and bicycle improvements were prioritized in order to provide a more tangible spending paradigm for the SCRCOG region. The areas were prioritized based on the quantity of previous bicycle and pedestrian-related reports that mentioned a desire to improve that particular area. Some reports simply acknowledged that there were deficiencies within a particular area, some reports cited an existing knowledge of high crash rates within the particular area, and some reports suggested very specific streetscaping redesigns for the areas. The plans that were reviewed included, but were not limited to, the previous *2007 Regional Plan*, POCD for each town and city, Road Safety Audits RSAs for each municipality that had them conducted, and the *Draft 2017 Statewide Plan Update*. Areas that were mentioned in the highest number of reports were given the highest priority.

In addition, Strava data was reviewed for each municipality and used as a method for further prioritization. Strava is a mobile application that bicyclists can download, and use to track their trips. The data from the application shows approximate bicycle ridership on routes throughout each town. If the area that was identified as having a significant concentration of bicycle crashes also had high bicycle ridership, then this area was given further priority.

Areas identified as having significant concentrations of crashes were given one point for each bicycle and pedestrian-related report that mentioned the area needing improvement, and one point if the Strava data showed high ridership. Total points for each individual area ranged from 0-4, and priority levels of Low to Very-High were assigned. A complete list of the areas identified as having significant concentrations of bicycle and pedestrian crashes, and their assigned priority level is shown in the table on the following pages.



SCRCOG Priority Corridors and Intersections, May 2017 *(Sources: Fitzgerald & Halliday, Inc., 2016-2017 CTDOT Community Connectivity RSAs in the SCRCOG region; Draft 2017 Connecticut Statewide Bicycle & Pedestrian Plan Update; SCRCOG Municipal POCDs; Strava)*

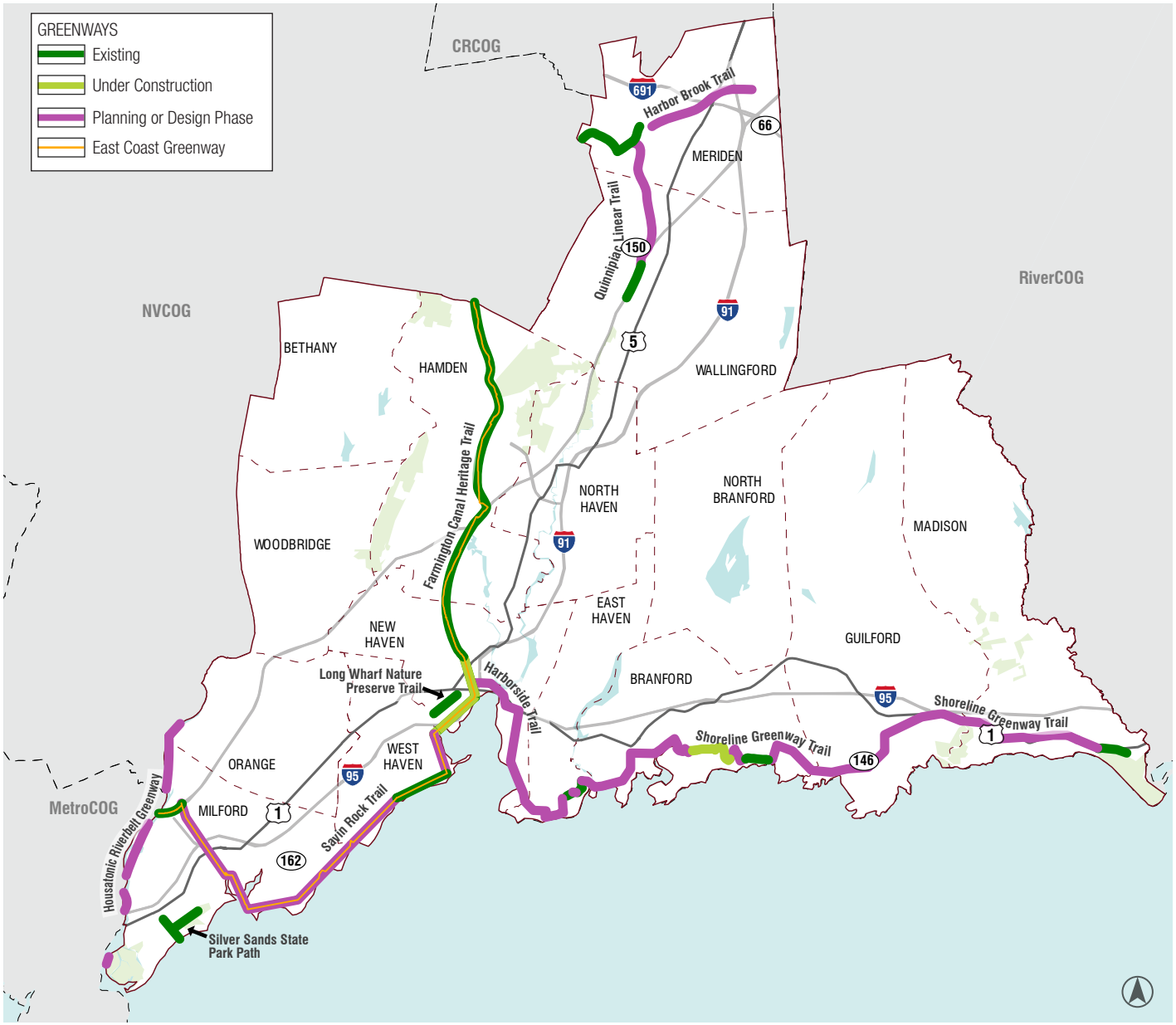
PRIORITY MATRIX

MUNICIPALITY	AREA TYPE	CORRIDOR / INTERSECTION	BEGIN / END	CRASH OCCURRENCE	INCLUDED IN 2007 SCRCOG PLAN	INCLUDED IN MUNICIPALITY'S POCD	COMMUNITY CONNECTIVITY RSA	INCLUDED IN STATEWIDE BIKE / PED PLAN	HIGH RIDERSHIP (STRAVA)	SCORE	PRIORITY LEVEL
Madison	Suburban Corridor	Route 1 (Boston Post Road)	Entire length town-wide	7 bike crashes	X	X		X	X	4	Very High
Milford	Suburban Corridor	Route 1 (Boston Post Rd / Bridgeport Ave)	Entire length town-wide	15 ped crashes (1 fatal)	X	X	X	X		4	Very High
Hamden	Urban Corridor	Route 5 (State Street)	From Ridge Road to Cook Street	5 ped crashes, 1 bike crash	X	X		X		3	High
Wallingford	Urban Corridor	Route 5 (South / North Colony Road)	From Parsons Street to Church Street	4 ped crashes, 3 bike crashes	X	X		X		3	High
Branford	Urban Corridor	Route 1 (West Main Street)	From western town line to Short Beach Road	4 ped crashes	X	X				2	Medium-High
Branford	Suburban Corridor	Route 146 (Montowese Street)	From Meadow Street to Pine Orchard Road	3 bike crashes	X	X				2	Medium-High
Guilford	Suburban Corridor	Route 1 (Boston Post Road)	500 feet east and west of Tanner Marsh Road	2 ped crashes	X	X				2	Medium-High
Hamden	Urban Corridor	Route 10 (Dixwell Avenue)	500 feet north and south of Arch Street	4 ped crashes	X	X				2	Medium-High
Hamden	Urban Corridor	Route 10 (Dixwell Avenue)	1000 feet north and south of Church Street	7 ped crashes, 2 bike crashes	X	X				2	Medium-High
Hamden	Suburban Intersection	Route 10 (Dixwell Avenue)	At Hillcrest Avenue	2 ped crashes (1 fatal)	X	X				2	Medium-High
Meriden	Urban Corridor	Rotue 71 (West Main Street)	From Vine Street to Cook Avenue	10 ped crashes, 2 bike crashes	X					1	Medium
New Haven	Urban Intersection	Rotue 10 (Ella T Grasso Blvd)	At Whalley Avenue	1 fatal ped crash	X					1	Medium
Orange	Suburban Corridor	Route 1 (Boston Post Road)	Entire length town-wide	6 ped crashes, 1 bike crash		X				1	Medium

MUNICIPALITY	AREA TYPE	CORRIDOR / INTERSECTION	BEGIN / END	CRASH OCCURRENCE	INCLUDED IN 2007 SCRCOG PLAN	INCLUDED IN MUNICIPALITY'S POCD	COMMUNITY CONNECTIVITY RSA	INCLUDED IN STATEWIDE BIKE / PED PLAN	HIGH RIDERSHIP (STRAVA)	SCORE	PRIORITY LEVEL
West Haven	Urban Corridor	Boston Post Road	From Forest Road to Marginal Drive	6 ped crashes, 5 bike crashes		X				1	Medium
West Haven	Urban Corridor	Route 122 (1st Avenue / Campbell Avenue)	From Elm Street to Boston Post Road	6 ped crashes, 6 bike crashes						0	Low
West Haven	Urban Corridor	Elm Street	From Water Street to 1st Avenue	2 ped crashes, 2 bike crashes						0	Low
East Haven	Suburban Intersection	Kimberly Avenue	At Forbes Place	1 ped crash, 1 bike crash						0	Low
East Haven	Urban Corridor	Route 80 (Foxon Road)	From western town line to Strong Street	4 ped crashes						0	Low
Meriden	Urban Intersection	Route 71 (West Main Street)	At Linsley Avenue	3 ped crashes						0	Low
New Haven	Urban Corridor	Route 80 (Foxon Blvd)	From Eastern Street to Quinnipiac Avenue	9 ped crashes, 1 bike crash						0	Low
New Haven	Urban Corridor	Route 63 (Whalley Avenue)	From Drive to Liberty Bank to Davis Street	9 ped crashes						0	Low
New Haven	Urban Corridor	Route 1 (Church Street / Union Avenue)	From Columbus Avenue to Oak Street Connector	9 bike crashes						0	Low
New Haven	Urban Corridor	Route 10 (Ella T Grasso / Whalley Avenue)	From Chapel Street to Hobart Street	8 ped crashes						0	Low
North Haven	Surburban Corridor	Route 22 (Clintonville Road)	Fieldstone Court to North Branford town line	1 ped crash, 4 bike crashes						0	Low
West Haven	Urban Corridor	Route 122 (1st Avenue / Campbell Avenue)	From Elm Street to Boston Post Road	6 ped crashes, 6 bike crashes						0	Low

B. Off-Road Priority Areas

East Coast Greenway *(Trail of Regional Significance)*	The East Coast Greenway is planned to extend through Hamden, New Haven, West Haven, and Milford. The East Coast Greenway in the SCRCOG region is made up in part by the Farmington Canal Trail, Savin Rock Trail, Wharf Nature Preserve Trail, and Silver Sands State Park Path. Both the Savin Rock Trail, and the Farmington Canal Trail are in need of full completion.
Farmington Canal Trail *(Trail of Regional Significance)*	Within the SCRCOG region, the Farmington Canal Trail is planned to run through New Haven and Hamden. The portion of the trail within New Haven that extends from the West Haven town line to the city center is still in need of completion. This segment of the trail is currently in construction.
Shoreline Greenway Trail *(Trail of Regional Significance)*	The Shoreline Greenway Trail is planned to extend through New Haven, East Haven, Branford, Guilford, and Madison. The trail is still in need of completion in the municipalities of Branford, Guilford, East Haven.
Housatonic Riverbelt Greenway *(Trail of Regional Significance)*	Within the SCRCOG region, the Housatonic Riverbelt Greenway is planned to extend through Orange and Milford. The entire portion of the Housatonic Riverbelt Greenway in Orange and Milford is in need of completion.
Quinnipiac Linear Trail	Within the SCRCOG region, the Quinnipiac Linear Trail is planned to extend through North Haven, Wallingford, and Meriden. Approximately 1.25 miles of this trail is still in need of completion within Wallingford from Fireworks Island to the northern town line in Wallingford.
Harbor Brook Trail	The Harbor Brook Trail runs through Meriden. The trail is still in need of completion from approximately the Bronson Avenue Park area to West Main Street in Meriden.
Savin Rock Trail	The Savin Rock Trail is planned to run through West Haven towards the Milford town line, and also northerly towards trails in New Haven. The trail is still in need of completion from Bradley Point Park westerly to the Milford town line, and also from the Sandy Point Bird Sanctuary to the Yale campus in New Haven.
Harborside Trail	The Harborside Trail is planned to run through New Haven from the mouth of the West River to Lighthouse Point. The entire portion of the Harborside Trail is still in need of completion.



SCRCOG Greenways, April 2017 *(Sources: Fitzgerald & Halliday, Inc., Department of Energy & Environmental Protection, Meriden Linear Trail, Shoreline Greenway Trail, Farmington Canal Rail to Trail Association, Trail Link, New Haven Land Trust)*

C. Design Recommendations

1. Suburban Corridors

In suburban areas, housing and commercial developments are typically less dense relative to urban areas and the recommended corridor designs for such areas should be contextually appropriate.

Sharrow marking *(Image credit: Streetsblog)*

In suburban areas, the shoulders along main corridors should be a minimum of 6 feet wide on both sides. On roads where traffic volumes and speeds are lower, sharrow markings may be more appropriate than shoulders.

Sidewalks with a minimum of 5 feet in width should be provided on at least one side of all suburban corridor It is preferred that sidewalks exist along both sides of main corridors. There should be clearly marked zebra crossings at all points where the sidewalk on one side of the roadway ends, and pedestrians are forced to cross the roadway. Additionally, it is recommended that the roadway should be designed with visual cues to encourage motorists to slow down at all places where pedestrians are guided to cross the street. This is also known as 'visual narrowing' and can be accomplished with street furniture, landscaping, curb alignments, or gateway treatments.

Whenever possible, vehicle lane widths on suburban corridors should be a maximum of 10.5 feet though 10-foot lane widths are preferred. When streets are designed with lane widths that are wider than necessary, they are typically much more likely to travel at speeds that are unsafe to pedestrians and bicyclists with whom they are sharing the road.

2. Suburban Intersections

At suburban intersections, there should be marked zebra crosswalks on all approach legs of the intersection. Pedestrian push buttons should be provided at all corners of signalized intersections. Upon approach of the intersection, there should be visual cues provided to drivers that they will need to slow their vehicle, and potentially come to a stop to let a pedestrian or bicyclist cross the roadway. This is best done using visual narrowing tactics, as previously described.

Speed hump *(Image credit: City of Redmond, Washington)*

Curb radii at should be very small at suburban intersections where pedestrian and bicycle activity is expected or encouraged. When curb radii are larger, vehicles are inclined to travel fast around corners, which can create unsafe conditions for pedestrians and bicyclists. Smaller curb radii also help to shorten the distance that pedestrians and bicyclists have to cross. A shortened crossing distance means less time in the roadway, and less of a chance for a conflict with a vehicle. The use of medians in the center of an approach is another great visual narrowing tactic that can help slow vehicle speeds, and create more pedestrian friendly environments at intersections. These medians can also be used as a space for flowers or shrubbery that improves the aesthetics of the area.

Bicyclists along Strawberry Hill in Norwalk *(Image credit: Mike Mushak via Nancy on Norwalk)*

3. Urban Corridors

Along urban corridors, housing and commercial development is expected to be more dense than in suburban areas. This density of development is important in order to provide a pedestrian and bicycle-friendly environment. Urban corridors with buildings that are aligned to the edge of the sidewalk create a much friendlier pedestrian experience. In addition, the proximity of buildings to the roadway edge acts to narrow the visual space of drivers. In places where it is not reasonable or not possible to construct buildings close to the roadway edge, visual narrowing can also be accomplished with street trees and / or on-street parking. This narrowing encourages vehicles to travel slower. There is significantly less of a chance that pedestrian and bicycle crashes will be fatal when vehicles are traveling at slower speeds.

Vehicle lane widths should be a maximum of ten feet in urban areas whenever possible. Narrower lane widths will encourage drivers to travel slower, providing a safer environment for pedestrians and bicyclists. It should be noted that providing more pedestrian and bicycle friendly environments does not necessarily mean that vehicle travel times will be compromised. In fact, research has shown that vehicle travel times and vehicle delay is actually reduced in urban areas that have been designed to better accommodate pedestrians and bicyclists (https://trid.trb.org/view.aspx?id=1393876).

Sidewalks with a minimum width of five feet should be provided on both sides of all urban corridors. It is important that the pedestrian network in urban areas is continuous, and that there are no gaps in the urban sidewalk network. This is particularly important in areas where there is a high amount of commercial and retail development.

Bike lanes with a minimum width of five feet should also be provided on both sides of all urban corridors when possible. On urban roadways where vehicle speeds and traffic volumes are lower, sharrow markings on the roadways are also appropriate instead of bike lanes.

While it is ideal to include all the elements described here (bike lanes, sidewalks, 10' traffic lanes, and on-street parking), there are times when the right-of-way is not wide enough to accommodate all these features. When this occurs, it's important to assess the priorities for the overall transportation network as well as for the specific street. All involved should be encouraged to understand the needs and priorities of the municipality, community, and travelers. The *New Haven Complete Streets Guide* and the *NACTO Urban Street Design Guide* are both excellent resources to consult for urban corridor design in Connecticut.

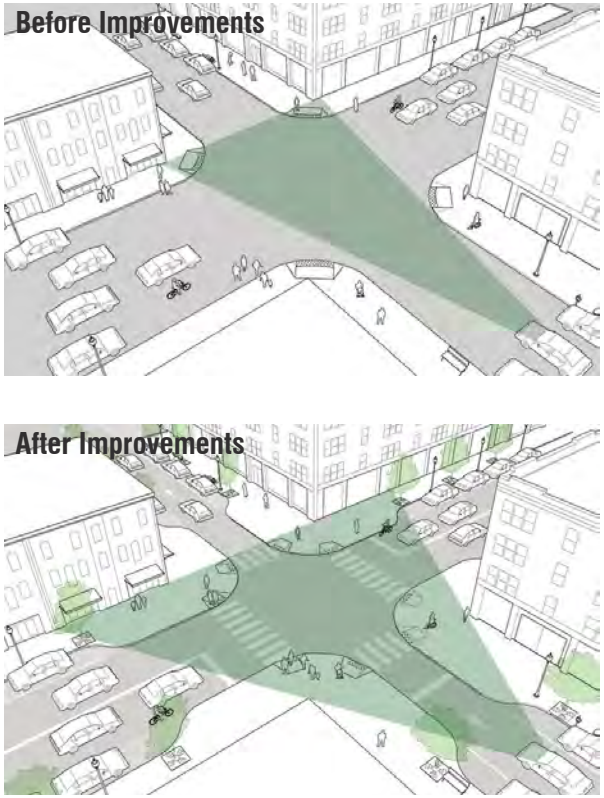
Comfortable pedestrian environment with buildings that line the sidewalk, seating, landscaping, & other amenities *(Image credit: PlannerDan: Review: A New Streetscape for Burlingame Avenue)*

Curb bump-outs can be painted as a low-cost, temporary installation during a trial period along a roadway *(Image credit: Clarence Eckerson Jr. via StreetsBlogSF)*

Curb bumpouts visually narrow the roadway and provide enough space for benches or other pedestrian amenetieis *(Image credit: SF Better Streets)*

4. Urban Intersections

At urban intersections, it is extremely important that curb radii be small. The smaller curb radii will encourage and force drivers to make turns at slower speeds. With slower turning vehicles, conflicts with pedestrians and bicycles will be less common and also less severe. In addition to smaller curb radii, it is recommended that bump-outs be installed. Bump-outs would help to reduce the crossing distance for pedestrians and bicyclists at intersections. This will reduce the amount of time that pedestrians and bicyclists are in the roadway, and reduce the potential for conflict. Bump-outs are most appropriate in an urban environment but it is also necessary that factors, such as road drainage, need be considered in the implementation of such modifications. Crossing islands in the center of roadways can also help to reduce the amount of time that pedestrians and bicyclists are vulnerable to conflicts with pedestrians and bicyclists.



Improved visibility / sight distance at intersections can be achieved through a variety of design strategies, as illustrated above *(Image credit: National Association of City Transportation Officials (NACTO)*

In addition to the narrowing / shortening of pedestrian and bicycle crossing distances, all approach legs to urban intersections should have marked crosswalks. Crosswalks can be marked using zebra striping, or can be marked with an alternative type of material such as bricks or stamped concrete. Alternative materials are generally more aesthetically pleasing, and create a more pedestrian and bicycle friendly environment than traditional zebra striping, but can also be slightly more expensive.

At signalized intersections, pedestrian push buttons should be provided at all street corners. At intersections where there are bike lanes, careful attention should be paid to the design. There are many different strategies to make bicyclists more visible at urban intersections such as bike boxes. The *New Haven Complete Streets Guide* and the *NACTO Urban Street Design Guide* are both excellent resources to consult for urban intersection design in Connecticut. It should be noted that providing more pedestrian and bicycle friendly environments does not necessarily mean that vehicle travel times will be compromised. In fact, research has shown that vehicle travel times and vehicle delay is actually reduced in urban areas that have been designed to better accommodate pedestrians and bicyclists (https://trid.trb.org/view.aspx?id=1393876).

5. Greenways

Guidelines on the design of greenways help to ensure that such walking and biking trails are accessible to all users, provide a scenic and pleasurable route, display a consistent 'brand' across numerous diverse areas, strengthen multi-modal connectivity throughout the region, minimize environmental impacts, and minimize necessary maintenance in the future. While SCRCOG will continue to encourage the continued development of a regional trail network, the responsibility and funding for the maintenance of such trails should be agreed upon prior to construction.

When determining an alignment for trails that are still in the planning phase, it's important to consider where the optimal scenic viewpoints are and where people will want to travel to / from. New greenways should connect to

existing greenways and other key destinations to strengthen the overall bicycle and pedestrian connectivity. Trails along rivers, shorelines, and other waterways often provide a natural alignment while providing people with an attractive feature to enjoy. If such an alignment is chosen, bridges might need to be considered. It's also crucial to minimize environmental impacts and avoid any areas that would adversely affect the area's wildlife Steep slopes should also be avoided since it will be difficult to construct a trail with an appropriate grade that would be acceptable. Other areas that are not preferable are those with ridge cliffs, stream bottoms, active farmland, wetlands, and private property.

The design of the greenway path should be wide enough to accommodate bicyclists and pedestrians. A minimum of ten feet is suggested but it would be advisable to widen the path at places where many people are likely to be either entering or exiting the trail, such as town centers.

The surface material is also a key consideration and can have a significant impact on the amount of maintenance that is necessary in the future. Types of surfaces can be organized into three general categories:

- Native surfaces: These surfaces require minimal maintenance and is composed of natural material, such as rock and soil. These surfaces are typically not accessible to all and can traverse areas with steeper slopes.
- Firm surfaces: These types of surfaces are unpaved and look natural. However, the material used to create the trail has been hard packed to create a firm surface that can easily be traveled by those in wheelchairs, with strollers, etc. The level of required maintenance is heavily dependent on the season, number of trail users, and weather conditions, such as heavy rainfall.
- Stable surfaces: These are paved surfaces that are not significantly affected by weather and can sustain normal wear and tear. They are very accessible to all users. They can require a greater investment upfront but maintenance thereafter is often minimal with planned maintenance cycles.

Stable surfaces should utilized along sections of greenways that have high numbers of pedestrian and bicyclist traffic. This type of surface is often also contextually appropriate for more urban areas. Firm surfaces are more appropriate for areas of the greenway that are less frequently traveled upon. Native surfaces are typically used for greenways within very natural settings that people primarily use for recreational purposes.

Entrance and exit points to the trails should be designed to sustain higher levels of traffic as well as with features such as trailheads to welcome people to the greenway. Directional signage may be necessary for greenways that travel through wooded areas to ensure people remain on the trail alignment. Educational signage about key cultural, historical, or ecological features might also be considered as an attractive feature.

Some greenway alignments include on-road sections or roadway crossings. For guidance on designing these sections, please refer to the 'suburban corridor' or 'urban corridor' that were previously described.

Trailhead at Farmington Canal Trail in New Haven *(Image credit: Boret "Bo" Lonh, Department of Cultural Affairs, City of New Haven)*

Linear Trail in Meriden *(Image credit: My Record Journal)*

D. Policy Recommendations

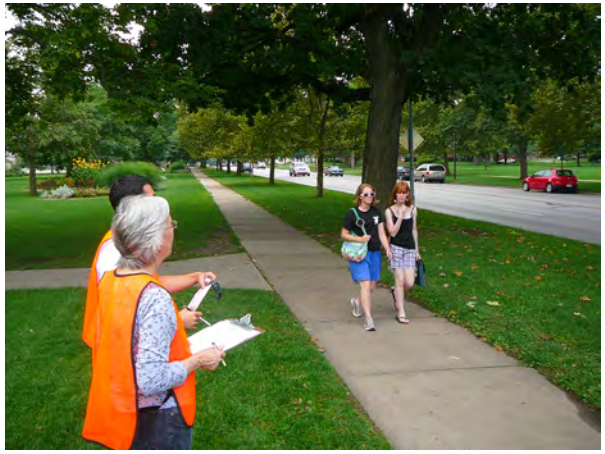
1. Bicycle and Pedestrian Count Program

It is important to have a clear picture of the travel patterns and trends across the region in order to understand which areas may be prioritized for bicycle and pedestrian improvements. It is equally important to assess how these travel patterns change over time. Data on this type of information will allow for a fuller understanding of the level of impact of various types of improvements. Additionally, data collection over time allows for the clear measure of progress by keeping track of quantitative benchmarks.

Volunteers in Manchester, NH count bicyclists and pedestrians at eight intersections on two days in the spring *(Image credit: Bike Manchester)*

It is recommended that the interested municipalities in the region initiate a program to collect data on bicycle and pedestrian counts on an annual basis. Such annual Bicycle and Pedestrian counts would involve the recruitment of volunteers to assist in the count activity.

Counts would be taken at the priority corridors and intersections identified in this Regional Plan Update. The interested municipalities could work together with SCRCOG staff to develop a standard methodology by which the counts could be taken. Recruited volunteers would participate in a brief training program to understand how the counts should be taken and recorded. The counts would be taken annually during a defined period, with the municipalities determining a few days which do not have special events, weather or other variables which would adversely impact the counts. This data could be summarized and made publicly available on the SCRCOG website.



Example of volunteers utilizing the National Bicycle and Pedestrian Documentation Project *(Image credit: Ride Lawrence)*

2. Complete Streets Policy

SCRCOG is currently undertaking the preparation of a *Regional Complete Streets Toolbox* and pilot project for the City of Milford. Once completed, this Complete Streets Toolbox will provide SCRCOG municipalities with guidance on complete streets to be tailored to their individual needs. Complete Streets are streets designed to be safely accessible to all users, including motorists, pedestrians, bicyclists, and transit users of all ages and abilities.

Utilization of the *Complete Streets Toolbox* will allow individual municipalities to incorporate this design approach into their transportation projects. The goal would be to allow the region's transportation system to become more multi-modal and inclusive of all users.

3. Transit-Oriented Development

SCRCOG has already led numerous planning efforts aimed at creating a truly comprehensive and integrated transportation system across South Central Connecticut by strengthening TOD on both the regional and municipal scale.

The *2015 SCRCOG Regional Transit-Oriented Development Study* outlined steps each municipality could consider to advance TOD near their railroad station. Interested municipalities have taken further steps to advance the potential for TOD near the railroad station. SCRCOG will assist these municipalities as appropriate to advance TOD, where viable, throughout the region.

4. Advancing Bicycle and Pedestrian Improvements

Successful implementation of the action strategies outlined in Chapter 3 of this document depend upon the priorities established by each municipality. As each municipality has different needs and priorities, advocacy for municipal projects necessarily must advance to municipal leaders and then to SCRCOG for possible consideration and utilization of any available funding. Solicitations for available funding sources are forwarded to each municipality for consideration. Responses received are considered by the Transportation Committee and the Transportation Technical Committee for ranking and recommendations for action by the SCRCOG chief elected officials. The recommendations of this report will be an important factor in the ranking of municipal projects for any funding available to the region for bicycle and pedestrian projects.

Transit Oriented Development Opportunities for the SCRCOG region *(Image credit: Transit Oriented Development Opportunities for the South Central Region (June 2015))*