South Western Region Bicycle and Pedestrian Plan

South Western Regional Planning Agency

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Prepared by:
South Western Regional Planning Agency
888 Washington Boulevard, 3rd Floor
Stamford, CT 06901
203.316.5190
www.swrpa.org

SWRPA
SOUTH WESTERN REGIONAL PLANNING AGENCY

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1-1: Introduction

This chapter presents the vision and goals of the *South Western Region Bicycle and Pedestrian Plan*. In addition, it summarizes the relevant policies of the United States Department of Transportation and Connecticut Department of Transportation, who are responsible for a great deal of the funding for bicycle and pedestrian facilities. It also reviews the bicycle and pedestrian policies and recommendations contained in state, regional, and local transportation plans as well as local plans of conservation and development.

1-2: Vision and Goals

The vision and goals of the South Western Region Bicycle and Pedestrian Plan mirror those of the latest *Connecticut Statewide Bicycle and Pedestrian Plan Update*. Doing so acknowledges the significant effort that went into developing the statewide plan's vision and goals and promotes conformity between the two agencies. In certain instances, the goal statements have been modified to make them applicable to the context in which and the stakeholders with whom SWRPA operates.

Vision:
To encourage and promote bicycling and walking throughout Connecticut's South Western Region by providing for the safe, convenient, and enjoyable use of these modes of transportation. To promote and enhance the mobility and accessibility of everyone who bicycles or walks in the Region.

Goals:
Goal 1 – Develop and maintain a safe, efficient, accessible, and convenient bicycle and pedestrian system for the benefit of its users.

1.1) Develop and construct new, expanded or upgraded bicycle and pedestrian facilities as part of road and transit facility construction, reconstruction, and maintenance projects.

1.2) Maintain sidewalks, on-road bicycle facilities and multi-use trails in a safe condition.

1.3) Designate an overall network of on-road bicycle facilities that accommodates the needs of commuting, recreational, touring, and utility bicyclists of all ages and abilities.

1.4) Evaluate and implement opportunities to widen paved shoulders and install route markers, pavement marking, and uniform signing on bicycle routes.

1.5) Develop and expand the network of multi-use trails.

1.6) Promote flexibility in design strategies to incorporate best practices and innovative funding, design, and construction solutions.

1.7) Review and maintain the South Western Region Bicycle and Pedestrian Plan so that it remains current and relevant.

1.8) Ensure that the South Western Region Bicycle and Pedestrian Working Group meets regularly to address ongoing issues and updates to the Plan.

Goal 2 – Integrate and connect the pedestrian and bicycle system with the rest of the surface transportation system.

2.1) Provide pedestrian and bicycle connections to the rest of the transportation system and close gaps near intermodal facilities including bus and rail stations.

2.2) Provide sufficient bicycle storage facilities (racks and lockers) to accommodate demand at bus and rail stations and at State park and ride facilities.

2.3) Provide accommodations for bicycle travel on all State-operated buses and trains.

2.4) Encourage municipal planning and zoning commissions to address pedestrian and bicycle access and egress as well as bicycle storage opportunities in their processes.

Goal 3 – Support and encourage pedestrian and bicycle connections between neighborhoods, commercial areas, employment centers, schools, state and municipal parks, and other community destinations.

3.1) Encourage South Western Region municipalities to make community destinations and recreation facilities accessible and convenient for use by bicyclists and pedestrians of all ages and skill levels.

3.2) Encourage developers to include pedestrian and bicycle facilities in their projects.

3.3) Coordinate with planning, public works, conservation and other relevant departments in South Western Region municipalities.

Goal 4 – Encourage and support measures to improve pedestrian and bicycle safety on state highways and local streets.

4.1) Monitor and analyze bicycle- and pedestrian-involved crash data.

4.2) Develop and implement countermeasures and mitigation strategies to reduce bicycle- and pedestrian-involved crashes on state highways and local streets.

4.3) Implement a *complete streets* approach to street design on state highways and local streets, where appropriate, to reduce automobile speeding, create more bicycle and pedestrian facilities, improve safety, and enhance livability.

Goal 5 – Develop and implement educational programs to ensure that transportation facilities will be used safety and responsibly.

5.1) Identify available and develop additional education programs to improve the skills of all bicyclists, regardless of age and ability.

5.2) Develop and provide educational materials for motorists, bicyclists, equestrians, and walkers to:
1) Improve their understanding of the rules of the road and applicable traffic laws;
2) Improve driver awareness of bicyclists, equestrians, and pedestrians; and
3) Encourage pedestrians to use available pedestrian facilities and safety devices

5.3) Make available the *South Western Region Bicycle and Pedestrian Plan* and other information materials dedicated to informing the public of the availability and safe use of bicycle and pedestrian facilities throughout the South Western Region.

5.4) Develop and implement a promotional campaign to encourage increased use of bicycling and walking.

Goal 6 – Provide financial and technical support and seek to utilize all available funding for the development and construction of bicycle and pedestrian facilities throughout the South Western Region, within available resources and consistent with federal initiatives.

6.1) Encourage CTDOT to enact a consistent policy of providing non-federal match for all surface transportation modes.

6.2) Allocate and support the use of federal aid program funds from all programs that are eligible to be used for bikeway, trail, and walkway projects within the framework of a financial constrained transportation program.

6.3) Encourage CTDOT to streamline the project scoping, design, and review processes to maximize project efficiency and value.

6.4) Provide technical assistance to municipalities and advocacy groups in the development and advancement of bikeway, trail, and walkway plans and projects.

6.5) Coordinate and facilitate multi-town, regional, statewide, and national bikeway, trail, and walkway projects to expedite project development, design, and construction and to ensure consistency and interconnectivity of the system.

6.6) Seek out non-traditional funding sources and explore innovative financing techniques for bicycle and pedestrian facilities.

6.7) Provide bicycle and pedestrian transportation planning training to SWRPA and municipal staff as well as local advocacy organizations.

Goal 7 – Contribute to public health by providing safe and accessible opportunities for walking and bicycling.

7.1) Support programs and policies that allow residents and visitors to make walking and bicycling viable means of travel.

7.2) Collaborate with CT DEP and DPH as well as municipal environment and public health departments to develop bikeway, trail, and walkway projects and programs to enhance public health and encourage all to bicycle and walk more.

7.3) Promote and support Safe Routes to School programs that encourage students to walk and bicycle to school and seek opportunities to incorporate identified Safe Routes infrastructure needs into larger transportation projects.

1-3: Bicycle and Pedestrian Policies

Introduction

The United States Department of Transportation and Connecticut Department of Transportation recently updated their policies to reflect the greater attention towards bicycles and pedestrians in recent years. The policies of these two agencies are relevant to this plan as they have been and will likely continue to be the main sources of funding for bicycle and pedestrian projects. United States Department of Transportation's (USDOT) new policy reflects its commitment to a truly multimodal transportation system and its innovative collaboration with Department of Housing and Urban Development and Environmental Protection Agency to promote livability. Connecticut Department of Transportation's (CTDOT) recently developed policies represent a major shift, which will hopefully yield projects more accommodating of bicyclists and pedestrians.

United States Department of Transportation – Policy Statement on Bicycle and Pedestrian Accommodation

In March 2010, U.S. Department of Transportation Secretary Ray LaHood issued the *Policy Statement on Bicycle and Pedestrian Accommodation*. The statement lays out USDOT's support for "the development of a fully integrated active transportation system.[1]" Secretary LaHood encourages USDOT and other transportation agencies to "go beyond the minimum requirements" and to "give the same priority to walking and bicycling as is given to other transportation modes.[2]" Transportation agencies are urged to collect and analyze bicycle and pedestrian trip data in order to "optimize investments[3]" and to "make facility improvements for pedestrians and bicyclists during resurfacing and other maintenance projects.[4]" The secretary identifies "bicycling and walking networks [as] an important component [of] livable communities[5]" that produce mobility, air quality, economic, and health benefits. The USDOT encourages other transportation agencies, such as SWRPA, to adopt their own bicycle and pedestrian policy statements that adhere to the spirit of USDOT's policy. The policy statement is reproduced below:

> "The DOT policy is to incorporate safe and convenient walking and bicycling facilities into transportation projects. Every transportation agency, including DOT, has the responsibility to improve conditions and opportunities for walking and bicycling and to integrate walking and bicycling into their transportation systems. Because of the numerous individual and community benefits that walking and bicycling provide — including health, safety, environmental, transportation, and quality of life — transportation agencies are encouraged to go beyond minimum standards to provide safe and convenient facilities for these modes.[6]"

USDOT also recommends actions that state and local governments, transit agencies, and community organizations can take to realize this policy. First and foremost, USDOT encourages other agencies and organizations to adopt similar policy statement "as an indication of their commitment[7]" to bicycle and pedestrian transportation. Next, USDOT lays out a series actions intended to further this policy, which are summarized below:

- Consider walking and bicycling as equals with other modes of transportation;
- Ensure that there are transportation choices for people of all ages and abilities, especially children;
- Go beyond minimum design standards;
- Integrate bicycle and pedestrian accommodation on , rehabilitation, and limited-access bridges;
- Collect data on walking and bicycling trips;
- Set mode share targets for walking and bicycling and track them over time;
- Remove snow from sidewalks and shared-use paths; and
- Improve non-motorized facilities during maintenance projects[8]

United States Department of Transportation – Livability

The USDOT policy statement on bicycle and pedestrian accommodation dovetails with Secretary LaHood's promotion of livability. The emphasis on livability crosses all the agencies within USDOT and forms the basis for USDOT's partnership with US Department of Housing and Urban Development and US Environmental Protection Agency. Six livability principles, listed below, guide the work of USDOT, its agencies, and its partners:

- Provide more transportation choices;
- Promote equitable, affordable housing;
- Enhance economic competitiveness;
- Support existing communities;
- Coordinate and leverage Federal policies and investment; and
- Value communities and neighborhoods

Bicycle and pedestrian transportation is an important component of livability, as it provides transportation choices, supports existing communities, and helps people and organizations value communities and neighborhoods.

Connecticut Department of Transportation –Bicycle and Pedestrian Policy

Bicycle and pedestrians advocates have been critical of the Connecticut Department of Transportation (CTDOT) for being a 'highway agency' that neither plans for bicyclists and pedestrians nor considers the needs of non-motorized travel as part of its highway projects. Connecticut's low mark in the League of American Bicyclists' Bicycle Friendly State rankings seemed to confirm these beliefs.

Responding to this sentiment, the Connecticut General Assembly passed a Complete Streets law in 2009, which mandated that "accommodations for all users shall be a routine part of the planning, design, construction and operating activities of all highways[9]." The law also specifies that at least 1% of highway funds expended by CTDOT and municipalities each year be devoted to bicycle and pedestrian facilities. The legislation created the *Connecticut Bicycle and Pedestrian Advisory Board* 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, program, and facilities for bicycles and pedestrians[10]."

In the past few years, CTDOT has made internal efforts to take a more multimodal approach to its work. In October 2010, CTDOT put forward six policy changes to make the Department more supportive of non-motorized travel. The policies are an attempt by CTDOT overcome past criticism and demonstrate a more contemporary approach to transportation. The six policy changes are presented below:

- *CTDEP-CTDOT Collaboration:* This policy encourages better collaboration between CTDOT and the Connecticut Department of Environmental Protection regarding bicycle and pedestrian issues, including multi-use trail funding.

- *Surface Transportation Enhancement-Enhancement Funding:* This policy reserves to the State fifty-percent of Surface Transportation Program-Enhancement (STP-Enhancement) funding and dedicates it to building bicycle and pedestrian facilities. CTDOT is responsible for project selection, providing the non-federal match, and construction of projects constructed with this funding. The remaining funds are allocated to projects selected by the Regional Planning Organizations (RPOs).

  CTDOT implemented this policy as part of the 2011 STP-Enhancement program solicitation. SWRPA issued its own solicitation for its suballocation of funds and selected a City of Norwalk project.

  This policy was subsequently superseded, albeit with a similar funding distribution scheme, when the MAP-21 Transportation Alternatives (TA) program replaced the STP-Enhancement Program. The statutory language of the TA program suballocates funds to the State as well as to Census designated urban areas and to rural areas.

  CTDOT has allocated its share of STP-Enhancement and TA funds to what it calls bicycle and pedestrian projects of statewide significance. According to CTDOT, a project is deemed significant if it is located on a major trail system, like the East Coast Greenway, or if it fills a longstanding gap in the State's trail system. CTDOT does not require a local match for these projects and administers the project itself rather than devolving administration to a municipality. No South Western Region projects were selected for funding under the State's portion of the STP-Enhancement / TA funds.

- Surface Transportation Program-Urban Funding: This policy makes bicycle and pedestrian projects eligible for funding from the Surface Transportation Program (STP-Urban) program. These funds are allocated to RPOs, who are responsible for project selection. It should be noted that while flexible funding for bicycle and pedestrian projects was a new policy in Connecticut, such flexibility was already allowed by the federal law that created the program[11].

  The City of Norwalk hopes to take advantage of this policy change by using STP-Urban funding to build a section of the Norwalk River Valley Trail. The segment, running from Union Park to Riverside Avenue, would connect two existing pieces of trail. At present, this project is going through CTDOT project development review process.

- *CTDOT Sidewalk Policy:* CTDOT amended its sidewalk policy to fund new sidewalks on state and local roads. Previously, CTDOT apportioned federal funds for new sidewalks only if a need was demonstrated and withheld state matching funds, thus requiring the municipality to fund the non-federal share. This policy now allows sidewalks to be funded according to the same federal-state-local share as the rest of the project

- *CTDOT Design Manual:* This policy will provide guidance on bicycle and pedestrian facilities in the CTDOT design manual. This policy has not yet been realized.

- *Quick Fix Program:* This policy was intended to better handle highway maintenance requests from cyclists and pedestrians. Such quick fix, low cost solutions were not previously possible because of financial constraints. To implement this policy, CTDOT created an online form for the public to identify unsafe locations or report a crash.

1-4: Summaries of Other Plans

Introduction

An important component of many planning efforts is understanding and building upon likeminded plans and studies put forth by partner organizations. In the case of bicycle and pedestrian planning, many of SWPRA's partner organizations, including its member municipalities, have studies and plans examining these issues. These plans range from all-encompassing state studies to detailed multi-use trail plans to chapters and references in municipal plans of conservation and development. All of the studies emphasize similar measures: multi-use trails, on-street bicycle lanes and sidewalks, improved safety and enforcement of existing laws, secure bicycle parking, and most importantly, funding to implement the recommendations. All of the plans share a similar vision: "To encourage and promote bicycling and walking throughout Connecticut by providing for the safe, convenient, and enjoyable use of these modes of transportation."[12]

For each study reviewed, a brief summary is presented with an emphasis on any findings related to bicycle and pedestrian transportation in Connecticut's South Western Region.

Comprehensive Bicycle & Pedestrian Plans

2009 Connecticut Statewide Bicycle and Pedestrian Transportation Plan
Connecticut Department of Transportation – Prepared by Fitzgerald & Halliday, 2009.
http://ctbikepedplan.org/

This plan presents the current state of bicycle and pedestrian planning in Connecticut, lays out a vision and goals for the future bicycle and pedestrian transportation system, and describes how the Connecticut Department of Transportation's (CTDOT) can help realize that vision. This plan represents an update to and improvement upon CTDOT's 1999 plan. The plan was developed with an extensive public participation process that reached out to walking and bicycling advocates, local officials, and the walking and biking public throughout the state.

The plan is organized into several distinct topic areas. In order to understand the state of bicycle and pedestrian planning practice nationally, the plan first recognizes and evaluates what already exists in Connecticut. Then, these efforts are benchmarked against those of neighboring and nationally recognized states. By examining the state of the practice across the nation, it is hoped that we here in Connecticut can recognize opportunities for improvement.

The plan lays out a clear vision for bicycle and pedestrian planning in Connecticut:

- To encourage and promote bicycling and walking throughout Connecticut by providing for the safe, convenient, and enjoyable use of these modes of transportation. Any person will be able to walk, bicycle, or use other types of non-motorized transportation modes safely and conveniently throughout the State.

- A network of on-road facilities and multiuse trails will connect towns, regions, and Connecticut to neighboring states. Specifically, residential areas, employment centers, shopping areas, transit centers, recreation and cultural attractions, and schools will accommodate the walking and bicycling needs of users.

The plan also includes a detailed list of action strategies along with associated implementation options.

In order to demonstrate the utility of investing in bicycle and pedestrian facilities, one section of the plan focuses on demand for bicycling and walking in Connecticut. Figures presented in this section were derived from demand and cost-benefit models.

Recognizing recent legislative accomplishments in Connecticut, the next section of the plan outlines existing state statues regarding bicyclists and pedestrians. This section also considers state agency policies as they relate to bicycles and pedestrians, especially inter-agency cooperation and raising awareness of bicycles and pedestrians at CTDOT.

The plan devotes its next section to bicycle and pedestrian safety. This includes an analysis of motor vehicle accidents that involve bicycles and pedestrians as well as CTDOT's nascent effort to promote bicycle and pedestrian safety and a share-the-road culture.

Perhaps most importantly, the plan includes recommendations for bicycle and pedestrian facilities throughout Connecticut. This is a significant improvement from the 1999 plan, which did not include a map or identify facilities of statewide significance. Many of the proposed facilities identified in the plan were suggested by RPOs, which in turn represent the numerous and varied bicycle and pedestrian planning efforts at the local level. Also notable are a map of proposed cross-state bicycle routes and a bicycle suitability assessment of state highways.

The last section of the plan reviews existing funding sources for bicycle and pedestrian projects as well as potential new funding sources. Among the potential new funding sources are innovative finance methods that have been adopted by other states, such as New York, New Jersey and Oregon.

Inventory of Pedestrian Safety Needs
Town of Greenwich – Prepared by Selectmen's Pedestrian Safety Committee, 2006.
http://greenwichct.virtualtownhall.net/Public_Documents/GreenwichCT_FirstSelect/committees/PedestrianSafety/index

This report begins by noting that it has taken an unnecessarily long time to accomplish new sidewalk projects in Greenwich despite their desirability. The report focuses on pedestrian facilities in the vicinity of pedestrian traffic generators, such as schools, parks, playgrounds, trains stations, community facilities, houses of worship, and commercial corridors. The report emphasizes continuity of sidewalks, especially on busy arterials where crossing the street can be difficult or treacherous. The report urges the Town of Greenwich to promote walking and bicycling, especially for trips to the rail stations where auto parking is at a premium. The report notes that sidewalk projects in Greenwich are evaluated and prioritized by the Department of Public Works based on a set of criteria and that the most highly rated projects are expected to be implemented first.

Merritt Parkway Trail Study
Regional Plan Association – Regional Plan Association: Connecticut Office, 1994.
http://www.swrpa.org/Default.aspx?Transport=184

This study proposes a 37.5 mile multi-use trail in the Merritt Parkway right-of-way between Stratford and Greenwich. The study explains that the existing highway occupies the northern one-third to one-half of right-of-way, leaving ample room for a trail. The Merritt Parkway Trail would connect to a number of important north-south trails, including the proposed Norwalk River Valley / Route 7 linear trail, and would be an important link in the East Coast Greenway. The study notes that much of the land in the right-of-way has gentle grades that would be compatible with a multi-use-trail. The study explains there are many areas of ecological and scenic resources along the right-of-way, to which the public would have access. Given the length of the proposed trail, the study suggests developing demonstration segments in each community to show the feasibility of the trail design and build support from the public. The study notes that trails have successfully been developed adjacent to parkways in nearby New York State. The study notes that there are already

numerous public facilities along the right-of-way that could serve as access points to the trail. The study recognizes that there has been a long simmering tension between those who view the Merritt Parkway as a transportation facility and those who believe the right-of-way has significant recreational value. Because of this tension, the study believes it would be unlikely that CTDOT would take the lead in developing the trail.

Merritt Parkway Multi-Use Trail Feasibility Study
Connecticut Department of Transportation, ongoing.
http://www.ct.gov/dot/cwp/view.asp?A=4185&Q=491882

In 2011, CTDOT received a $1 million National Scenic Byways Program grant to produce a detailed feasibility study of the Merritt Parkway Trail. The purpose of the study is to determine whether a trail in the Merritt Parkway right-of-way would be appropriate given the scenic and historic character of the corridor. Like the 1994 Regional Planning Association study, this study will examine the potential for a trail in the undeveloped southern half of the right-of-way. The study activities completed to date include an existing conditions inventory and a series of public outreach meetings in each community through which the trail would pass. Forthcoming study products should include design concepts, another series of public meetings, and if the trail is deemed feasible, a detailed routing study including the proposed treatments at the Merritt Parkway's historic bridges and interchanges.

Mill River Park and Greenway Masterplan
Town of Stamford – Prepared by Olin Partnership, 2007.
http://www.millriverpark.com/master_plan.htm

This report identifies the Mill River Park and Greenway as an integral segment of a larger regional trailway system. The report presents detailed renderings of the major park features, including trails and connections to the existing grid of city streets as well as consistent streetscape elements to distinguish the park from the rest of the city. The report proposed crushed stone walkways as well as oil and chip penetration river walks for their esthetic value.

Mid-Hudson South Region Bicycle & Pedestrian Master Plan
Putnam, Rockland, and Westchester Counties, NY – Prepared by the RBA Group, 2007.
http://nymtc.org/project/bike_walk/bike_walk.html

This plan begins by recognizing bicycling and walking as integral components of an intermodal transportation system. The plan focuses on regionally significant projects, reflecting the fact that it is a multi-county plan. The plan recognizes that bicycling and walking are a viable option for a large segment of the populations but that there exist significant barriers in many communities including infrastructure and safety. The plan presents background data on the Mid-Hudson South region, including demographics and land use typologies as they relate to bicycling and walking. The plan uses a latent demand analysis to determine the demand for suitability of roads throughout the study area to bicycle treatments. For each proposed bicycle route, the plan identifies the extent of the facility, the area (land use) type, and significant needs/issues identified. The plan provides a cut sheet for each proposed bicycle route including facility type, key destination, connections to transit or other bicycle-pedestrian facilities, typical conditions (traffic) in corridor, major physical obstacles or barrier, cost estimates, and results of the latent demand analysis. The plan also sets out a series of guidelines for pedestrian facilities, bicycle facilities, and multi-use trails as well as supporting elements such as transit stations, traffic calming, bicycling parking, signings and markings, ADA considerations, and access management. The plan notes that the most significant source of funding for bicycle and pedestrian improvements in the study area has been federal surface transportation program funding as well as state funding.

Norwalk Connectivity Masterplan
Norwalk Redevelopment Agency – Prepared by Fitzgerald & Halliday, 2011
http://www.connectnorwalk.com/

This plan examined what opportunities exist to knit together Norwalk's downtown development projects with better walking, biking, and transit. The City of Norwalk has put a great effort towards redeveloping a two mile swath of land stretching from the South Norwalk rail station to Wall Street. Although development in this corridor has been piecemeal to date, the corridor is poised to develop rapidly in the coming years. The plan

has several focus area: complete streets; wayfinding; the pedestrian experience; becoming a bicycle-friendly community; and transit and parking. The improvements recommended in the study would support the high density, mixed use development envisioned for the corridor. The Norwalk Redevelopment Agency has advanced the recommendations contained in the Connectivity Master Plan through the development of a Parking Master Plan, a landscape design for West Avenue, and a fresh look at the potential to add bicycle lanes to West Avenue. SWRPA has helped to advance the Norwalk Connectivity Masterplan recommendations by assisting the City of Norwalk obtain a Transportation Alternatives grant. Funds from the grant will be used to add better crosswalks and pedestrian lighting to West Avenue in 2014.

Norwalk Pedestrian and Bikeway Transportation Study
City of Norwalk – Prepared by Fitzgerald & Halliday, 2011
http://ct-norwalk.civicplus.com/index.aspx?NID=1156

This study makes strategic recommendations on walking and bicycling in the City of Norwalk. To do so, the study identifies "priority corridors" for bicycle and pedestrian travel, and then divides those corridors into tiers based on safety, mobility, the presence of community facilities, public support, and residential context. Tier 1 corridors encompass many of Norwalk's major arterial streets, such as Eave Avenue, Main Avenue, Route 1, portions of Route 136, and Strawberry Hill Avenue. Tier 1 corridors are notable for multiple bicycle and pedestrian crashes or missing sidewalk segments in the vicinity of school or transit center. Tier 2 corridors connect to community facilities or have public support while Tier 3 corridors largely serve residential areas.

Based on the context of each corridor, the study recommends safety and mobility improvements. The bulk of the pedestrian improvements involve better sidewalks and sidepaths as well as associated curb ramps and crosswalks. For bicyclists, the study recommends deployment of "sharrows" and bike lane markings on priority corridors through Norwalk. Recommendations are presented in detail for each Tier 1 corridor, including the physical extent of each type of improvement, visualizations at key locations, and conceptual cross sections.

Norwalk River Valley Trail Routing Study
Norwalk River Valley Trail Steering Committee – Prepared by Alta Planning + Design, 2012.
http://www.nrvt-trail.com/

This study presents routing recommendations for a thirty-eight mile trail extending through the Norwalk River valley from Norwalk through Wilton, Ridgefield, and Redding to Danbury. The study was guided by a dedicated group of volunteers serving on the Norwalk River Valley Trail Steering Committee and funded by a Connecticut Department of Environmental Protection Recreational Trails Program grant. The study developed a series of possible routes for the trail to follow between Danbury and Norwalk. Each possible route was evaluated against a set of criteria, such as trail connectivity, aesthetics, economic development, permitting requirements, ease of construction, and estimated construction costs. The study suggests the preferred trail alignment would in many sections follow the Route 7 expressway right-of-way, which is owned by the CTDOT. The study notes there are many physical impediments to the construction of the trail, including street, railroad, and waterway crossings in Norwalk as well as topography and steep grades in Wilton.

Beyond determining a route, the study covers other elements of trail planning. The study suggests that the trail surface and its accessibility to different users would be context sensitive. For example, in more urban Norwalk, the current trail is a paved, multi-use path open to pedestrians, all types of bicyclists, and wheelchair users. Further north in Wilton, the trail would be soft surface and open to pedestrians (hikers), equestrians, and potentially bicycles. The plan also suggests locations where rest stations, parking, and other trail amenities could be located.

Going Forward: The Plan to Maintain & Improve Mobility: South Western Region Long Range Transportation Plan, 2011 – 2040
South Western Regional Planning Agency, 2011.
http://www.swrpa.org/Default.aspx?Transport=40

This plan serves as a "blueprint" for transportation investment in the eight municipalities comprising Connecticut's South Western Region. The plan's goals cover safety, security, the environment, land use, intermodal connectivity, system productivity, system performance, and financing. The plan presents a description of the South Western Region's existing transportation system and recommends a series of policies and improvement projects. The plan is comprehensive in nature, covering all elements of the transportation system in South Western Connecticut, including bicycle and pedestrian transportation.

The bicycle and pedestrian transportation chapter of the plan presents data on bicycle and pedestrian commuting, identifies state highway corridors with higher concentrations of crashes, and highlights the major multi-use trail proposals in the South Western Region. Census data indicates that bicyclists and pedestrians represent a small percentage of commuters in most municipalities. The chapter presents an overview of the so-called *Safety Corridors*, which are covered in more depth later in chapter three of this report. The chapter highlights the four major multi-use trail proposals in the South Western Region, which are the Merritt Parkway Trail, Norwalk River Valley Trail, Mill River Greenway, and the Greenwich I-95 Trail. All four trails are covered in more depth in chapter four of this report. Finally, several bicycle and pedestrian projects are listed as recommended projects, including the Merritt Parkway Trail, Mill River Greenway, and Norwalk River Valley Trail, as well as numerous small projects.

Town of Greenwich Bicycle Master Plan
Town of Greenwich – Prepared by Wilbur Smith Associates, 2001.
http://www.greenwichct.org/publicworks/PublicWorksDetail.asp?dcid=848

This plan describes priority needs and proposed improvements to make the Town of Greenwich more bicycle friendly. The plan was developed by the Town of Greenwich in cooperation with a local bicycle advocacy group Greenwich Safe Cycling. The plan focuses on roadways in the southern third of Greenwich, which is the most densely populated part of town. The plan identifies priority needs including a safer environment for bicycle and walking throughout town, safe crossings of US 1 and the streets adjacent to I-95 exits, safe routes to school, and secure bike parking at train stations, community facilities, recreation facilities, and in commercial areas. The plan identifies routes suitable for bicycle treatments based on national standards: compatible roadways that are suitable for experienced bicyclist to share with motorists, and designated roadways that are suitable for bicycle use and are signed and marked appropriately. The plan suggests and east-west bicycle route across Greenwich adjacent to I-95 as an alternative to congested US 1. The plan notes that bike improvements such as signing and marking can be easily implemented as part of regular road reconstruction recommends adding bicycle facilities to the Town's capital improvement plan.

Update of the Regional Bicycle Plan for the Greater Bridgeport Planning Region
Greater Bridgeport Regional Planning Agency – Prepared by Greater Bridgeport Regional Planning Agency, 2008.
http://www.gbrpa.org/studiesreports.html

This plan update presents the bicycle and pedestrian policy of the Greater Bridgeport Regional Planning Agency (GBRPA) and describes the region's major planned on- and off-road facilities. GBRPA's bicycle and pedestrian policy statement, originally developed for its 2004 Long Range Transportation Plan update, mirrors the United States Department of Transportation's policy on "accommodating bicycles and pedestrians facilities into all transportation projects unless exceptional circumstances exist[13]." The plan update envisions a network of on-road bicycle routes throughout the Greater Bridgeport Region. The planned routes were identified based on a set of performance criteria and will connect local activity centers, landmarks, transit facilities and shared-use trails. Placing bicycle routes on arterial roads with heavy traffic is discouraged as such routes are less desirable to bicyclists. The plan update also envisions a system of off-road trails, which may be more suitable for basic bicyclists. The Housatonic Railroad Trail would connect Bridgeport and Newtown using an abandoned railroad right-of-way. Large sections of this trail have been completed in Monroe and Trumbull. The other planned off-road trails are the Housatonic River Greenway and the Merritt Parkway Trail.

Plans of Conservation and Development – Bicycle and Pedestrian Elements

South Western Region – Regional Plan of Conservation and Development, 2006 – 2015
Prepared by South Western Regional Planning Agency, 2006.
http://www.swrpa.org/Default.aspx?Regional=41

This plan promotes centrality as a land use policy for Connecticut's South Western Region and supports urban growth in locations where infrastructure already exists. The plan recommends the implementation of a number of significant bicycle and pedestrian facilities, including Route 7 trail from Norwalk Harbor to Wilton, the Mianus River Gorge trail in Greenwich and Stamford, and the Mill River Greenway between Scalzi Park and the South End in Stamford. The plan recognizes that the Merritt Parkway Trail is the proposed routing for the East Coast Greenway through the Region and supports the demonstration in Stamford near exit 35. The plan also recommends determining an interim on-street routing for the East Coast Greenway through the Region.

Darien, Connecticut – Town Plan of Conservation and Development
Prepared by Town of Darien, 2006.
http://darienct.gov/content/104/114/3168/169/4077/default.aspx

This plan supports a policy to reduce excessive vehicle speeding and improve safety for vehicles, walkers, and bicyclists. The plan supports efforts made by the municipality to maintain existing sidewalks and build new sidewalks where appropriate. The plan notes that during the 1990s, sidewalks were added in the downtown and Noroton Heights areas of Darien but that critical gaps remain. The plan reiterates a 1996 Parks and Recreation Department plan identifying existing and desirable bicycle routes through municipal parks. This plan recommends better signage of existing routes and new routes, where desirable.

Greenwich, Connecticut – Plan of Conservation and Development
Prepared by Planimetrics, 2009.
http://greenwichct.virtualtownhall.net/Public_Documents/GreenwichCT_LandUse/pocd/index

This plan recognizes that outside of the village centers, sidewalks and bike facilities are in short supply in Greenwich. While sidewalk coverage around the commercial districts in village centers is somewhat well developed, beyond those centers it is discontinuous and lacking. The limited extent of sidewalks is due to the narrow streets, construction costs, desire to maintain neighborhood character, and public opposition. Nevertheless, Greenwich has a pedestrian safety committee that reviews sidewalk matters and recommends sidewalk construction, as identified in the *Inventory of Pedestrian Safety Needs*. The Greenwich pedestrian safety committee recommends building sidewalks in priority areas, such as around schools, in village districts, and along US 1.

In 2001, Greenwich completed its *Bicycle Master Plan*, which recommended a series of on- and off-street facilities for the Department of Public Works to build. Since the plan, only a few bicycle facilities, notably an on-street lane in Old Greenwich, have been built. Greenwich's Plan of Conservation and Development recommends implementing priority routes, establishing a pilot bike route through town, and adding bicycle parking to community facilities.

New Canaan, Connecticut –Plan of Conservation and Development
Prepared by Planimetrics, 2003.
http://www.newcanaan.info/content/9490/293/331/1522.aspx

This plan recognizes that New Canaan has a good sidewalk network in the town center and adjacent neighborhoods, noting that sidewalks are required as part of new development in these zones. The plan supports a bike trail plan for New Canaan as well as the Merritt Parkway trail as part of the East Coast Greenway. The plan also supports a network of greenways through the town over property easements.

Norwalk, Connecticut – Plan of Conservation and Development
Prepared by Chan Krieger Sieniewicz, 2008.
http://www.norwalkct.org/CityDept/planzon.asp

This plan recommends growing Norwalk's multiuse trail network as a means to connect parks and neighborhoods, provide public access to the harbor and Norwalk River and to promote public health. The plan recognizes that "walking trails [and] bike paths [are] signs of a kinetic, outdoors-oriented, 21st century lifestyle." In order to improve the walking and bicycling environment in Norwalk, the plans recommends that Norwalk develop a bike plan, paint bike lanes on select streets, promote the NorWALKER program, and invest capital improvement funds in the city's nascent multiuse trails. The plan identifies a multiuse trail network made up of the Norwalk River Valley Trail, the Harbor Bike path, and the Merritt Parkway Trail.

Stamford, Connecticut – Stamford Master Plan 2002
Prepared by Abeles Philips Preiss & Shapiro, Inc, 2002.
http://www.cityofstamford.org/content/25/52/138/164/202/88490.aspx

This plan proposes several major bicycle and pedestrian elements as part of an overall master plan. These elements including a loop around Stamford Harbor and the South End neighborhood, the Merritt Parkway trail as part of the East Coast Greenway, the Mill River Greenway, and bicycle lanes on Magee Avenue. The plan recommends the creation of greenways in environmental significant corridors, including the Merritt Parkway, Long Ridge Road, and Mill River as well as the Mianus River and the Noroton River. The plan also recommends that existing waterfront open space (Dyke Park) be linked to the Mill River corridor. The plan recommends bicycle parking at major generators as a short-term improvement.

Weston, Connecticut – Plan of Conservation and Development
Prepared by Town of Weston, 2010.

This plan notes public interest in developing walking facilities in Weston center as well as bicycle facilities on Weston's roads. A system of sidewalks would connect destinations such as the Town Hall, shopping center, public library, schools, and parks in Weston Center. School Road was called out as an appropriate location for a sidewalk. Improving walkability between these destinations would enhance the small town feel of Weston. Though some members of the public voiced concern over the hazards of bicycling on some roads, the Plan states that adding bicycle lanes to the town's narrow roads would entail taking private property, which the town is not in a position to do. Still, the plan suggests that bicycling should be encouraged. The plan also throws around the idea of closing off a street on occasion for the exclusive use by walkers and bicyclists.

Westport, Connecticut – Plan of Conservation and Development
Prepared by Planimetrics, 2007.
http://www.westportct.gov/agencies/landuse/planzone/2007+Town+Plan.htm

This plan identifies three priority corridors for bicycle and pedestrian improvements: the Shoreway corridor along the Long Island Sound coastline, Riverway corridor along the Saugatuck River, and the Merritt Parkway. The plan notes that current Town of Westport policy encourages or requires sidewalks in Westport Center and Saugatuck Center neighborhoods as well as along the Post Road (US 1). The plan recognizes that the majority of Westport residents support more sidewalks along the Post Road and in residential neighborhoods adjacent to Westport Center and Saugatuck Center. The plan recommends that the Town of Westport establish a bicycle committee to designate new bicycle lanes, promote bicycle use, and ensure a state of good repair of bicycle facilities. The plan also recommends providing bicycle parking at rail stations and in commercial districts.

Wilton, Connecticut – Plan of Conservation and Development
Prepared by Planimetrics, 2009.
http://www.wiltonct.org/departments/planning/plan_of_con_dev.html

This plan recommends improving the bicycle and pedestrian network in Wilton as a means to enhance the livability of commercial districts and to provide an amenity to residents. In order to preserve Wilton's semi-rural character, the plan proposes that the extant Route 7 expressway right-of-way be converted into a greenway with walking and bicycling trails. The plan notes that greenways can tie together open space properties, neighborhoods and community facilities. With regard to Wilton Center, the plan recommends improving the pedestrian environment by adding new sidewalks, developing a river walk along the west side of the Norwalk River, and constructing a pedestrian path to the rail station. The plan also recommends adding sidewalks between neighborhoods and areas like US 7 shopping districts, schools, and the Cannondale rail station as well as providing pedestrian accommodations at signalized intersections. Importantly, the plan recognizes that a majority of Wilton residents would like more opportunities to walk and bike to places in town

2 – Travel and Demographic Characteristics

2-1 Introduction

In order to plan for bicyclists and pedestrians, it is first necessary to understand who this population is and where they travel. Although no comprehensive counts of bicycle and pedestrian traffic in the South Western Region are available, evidence from other data sources suggest areas where bicycle and pedestrian activity is greatest. For instance, Census data reveals that about three percent of workers who reside in the South Western Region bicycle or walk to work. This population tends to be concentrated in more densely settled areas, including the region's downtowns, town centers, and neighborhood centers. Similarly, households with no vehicles available are concentrated in central areas. These locations tend to have the housing and employment density, mixed land uses, short blocks, and sidewalks that are more likely to generate bicycle and pedestrian trips. Many of these areas also have transit service, which complements bicycling and walking.

Census data also reveals some of the demographic characteristics of the population of bicycle and pedestrian commuters. Compared to all commuters in the South Western Region, bike and walk commuters tend to tend to be younger, have lower incomes, rent rather than own their residence, have shorter commute times, and have fewer vehicles available. Understanding who makes up the population of bike and walk commuters aids in the planning for and promotion of bicycling and walking.

Besides Census data, another piece of evidence about bicycle and pedestrian use is crash data. Unlike count (use) data, bicycle- and pedestrian-involved crash data is more readily available. Connecticut Department of Transportation (CTDOT) publishes a database of motor vehicle crashes on state highways, which includes collisions between motor vehicles and bicycles or pedestrians. Using GIS to analyze the data, the highways segments with the greatest concentration of crashes involving bicycles and pedestrians were identified. To highlight their importance, these highway segments are labeled *Safety Corridors.*

Safety Corridors:

- Greenwich – US 1
- Tresser Boulevard – US 1 (Stamford)
- Washington Boulevard – US 1 (Stamford)
- East Main Street – US 1 (Stamford)
- Connecticut Avenue – US 1 (Norwalk)
- Main Street – CT 123 (Norwalk)
- Westport – US 1 / CT 33

This report examines each *Safety Corridor* by describing the street characteristics and urban context, locating crashes, and assessing the factors that contributed to the crashes. After identifying any recurring patterns in the crash data, countermeasures that could improve safety are proposed. Countermeasures suggested in this report are based upon two Federal Highway Administration guidance documents. A summary of common countermeasures included in those guidance documents is provided as background information. In all circumstances, further and more thorough analysis of each *Safety Corridor* is recommended.

2-2 Where People Bike and Walk

Although there are no bicycle or pedestrian traffic counts available like there are for motor vehicles, locations where you more likely to find bicyclists and pedestrians can be inferred from analyzing demographic, land use and safety data. Generally speaking, areas characterized by mixed land use as well as higher population and employment density, which are characteristics of urban settings, are more likely to produce walking trips[14]. Areas with more urban street design characteristics, such as rectilinear street grids and short blocks, are more likely to produce bicycling trips[15]. Census data reveals areas where workers who commute by walking or bicycling reside as well as areas with greater percentages of households that have no vehicle available (and presumably rely on bicycling and walking for some trips).

Evidence from the Census

According to the 2006 – 2011 American Community Survey 5-year estimates, about 4.0% of workers residing in the South Western Region, or more than 6,800 commuters, either walk or bicycle to work. Although it is difficult to compare the 2000 Census and 2006 – 2011 American Community Survey, these figures would suggest a growth of about 33% over that time period. By and large, the growth of bike and walk commuters occurred in Stamford. About 6.4%, or about 4,000 workers, bike or walk to work in Stamford according to the 2006 – 2011 5-year estimates.

Table 1. Bicycle and walk commuters by municipality, 2000 & 2006 – 2011.

	2006 - 2011		2000	2006-2011	
Place	Population	Count	%	Count	%
Darien	20,580	137	1.7%	200	2.7%
Greenwich	61,023	1,036	3.7%	1,164	4.4%
New Canaan	19,642	265	3.3%	203	2.7%
Norwalk	85,145	981	2.2%	854	1.9%
Stamford	121,784	2,339	3.9%	4,014	6.4%
Weston	10,142	96	2.1%	42	1.0%
Westport	26,249	246	2.1%	272	2.5%
Wilton	17,973	78	1.0%	102	1.3%
SW Region	362,538	5,178	3.0%	6,851	4.0%
Connecticut	3,558,172	47,223	2.9%	56,573	3.3%

Source: U.S. Census Bureau, 2000 Census of Population and Housing and 2006 – 2011 American Community Survey

Generally, walk and bicycle commuters tend to reside in the region's largest communities: Greenwich, Norwalk, and Stamford. Within these communities, bike and walk commuters are concentrated in and around central business districts, which are characterized by relatively dense residential and commercial areas well as the presence of sidewalks and transit service. Among the twenty Census block groups in the 2000 Census with the highest percentage of bike and walk commuters in the region, fourteen were in Stamford, four were in Greenwich, and one was in each New Canaan and Norwalk. This geographical extent of this data is depicted in figure 1.

According to the 2006 – 2011 American Community Survey 5-year estimates, about 7.1% of households in the South Western Region, or more than 9,400 households, have no vehicle available. Presumably, these households rely on other means of transportation, including walking and bicycling, to travel to work or other destinations. Although it is difficult to compare the 2000 Census and 2006 – 2011 American Community Survey, the number of households with no vehicles available appears to have increased by about 6%.

Looking at 2000 Census data, the twenty census block groups with the highest percentage of households with no vehicles available have a similar geography as the census blocks with the most bicycle and walk commuters. This geographical extent of this data is depicted in figure 1.

Table 2. Households with no vehicle available, 2000 & 2006 - 2011.

		2000	2006-2011	
Place	Count	%	Count	%
Darien	191	2.9%	159	2.4%
Greenwich	1,221	5.3%	929	4.2%
New Canaan	151	2.2%	273	4.1%
Norwalk	2,838	8.7%	2,965	8.1%
Stamford	4,711	10.4%	5,262	11.6%
Weston	25	0.8%	20	0.6%
Westport	244	2.5%	283	3.0%
Wilton	91	1.5%	118	2.0%
SW Region	9,472	7.1%	10,009	7.4%
Connecticut	124,626	9.6%	119,213	8.8%

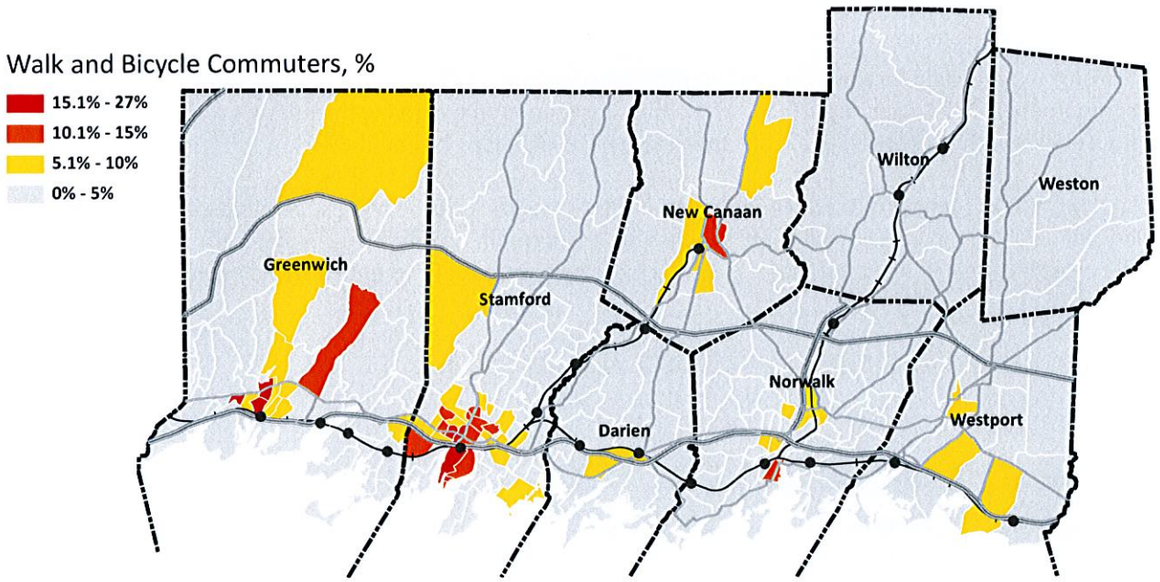
Source: U.S. Census Bureau, 2000 Census of Population and Housing and 2006 – 2011 American Community Survey

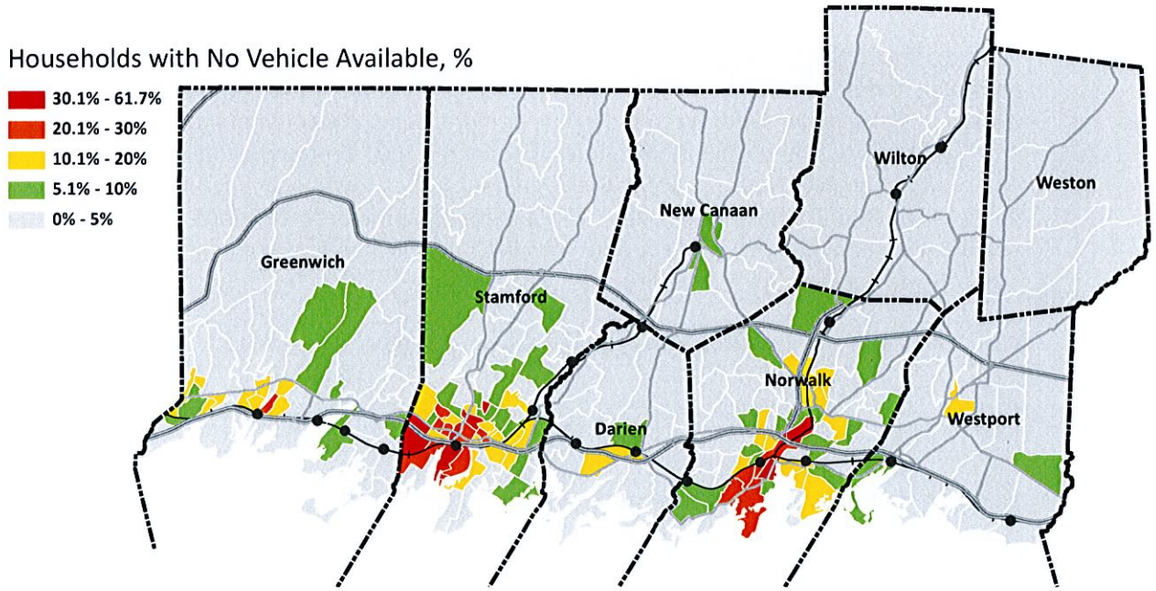
Evidence from Travel Data – Bus

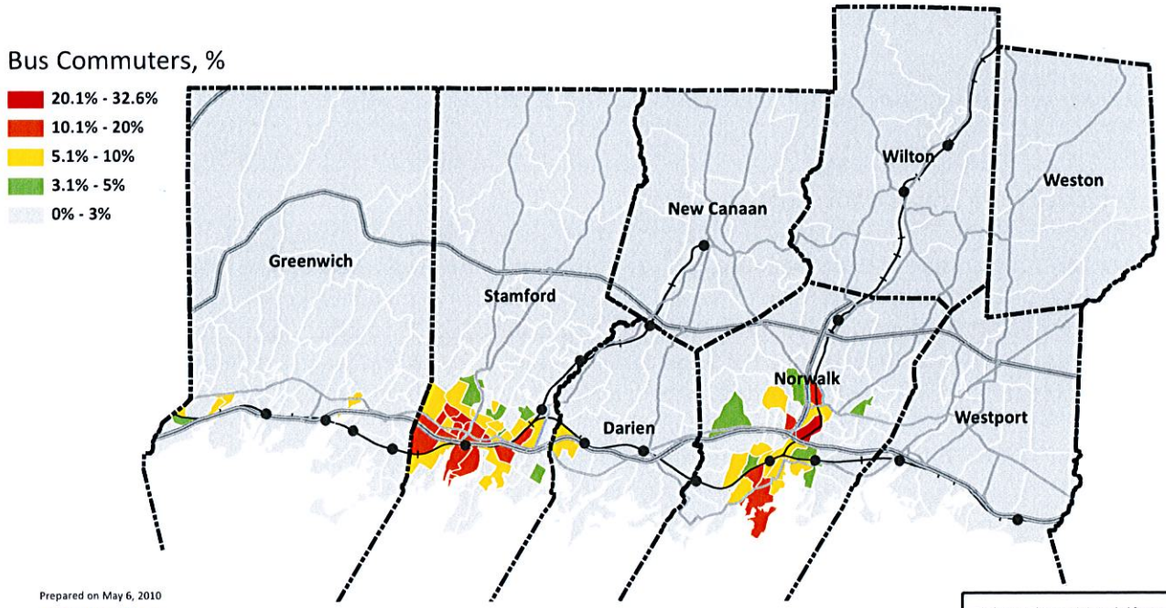
This count of walk and bike commuters may omit those workers who rely on walking or bicycling for a portion of their commute, such as transit commuters who walk or bike to the train station or bus stop. According to the 2006 – 2011 American Community Survey, about 2.9% of workers residing in the South Western Region, or nearly 5,000 commuters, use the bus to travel to work. Most if not all of these commuters have a walk trip at the beginning or end (or at both ends) of their bus trip. Although it is difficult to compare the 2000 Census and 2006 – 2011 American Community Survey, these figures would suggest a growth of about 13% over that time period. This geographical extent of this data is depicted in figure 1.

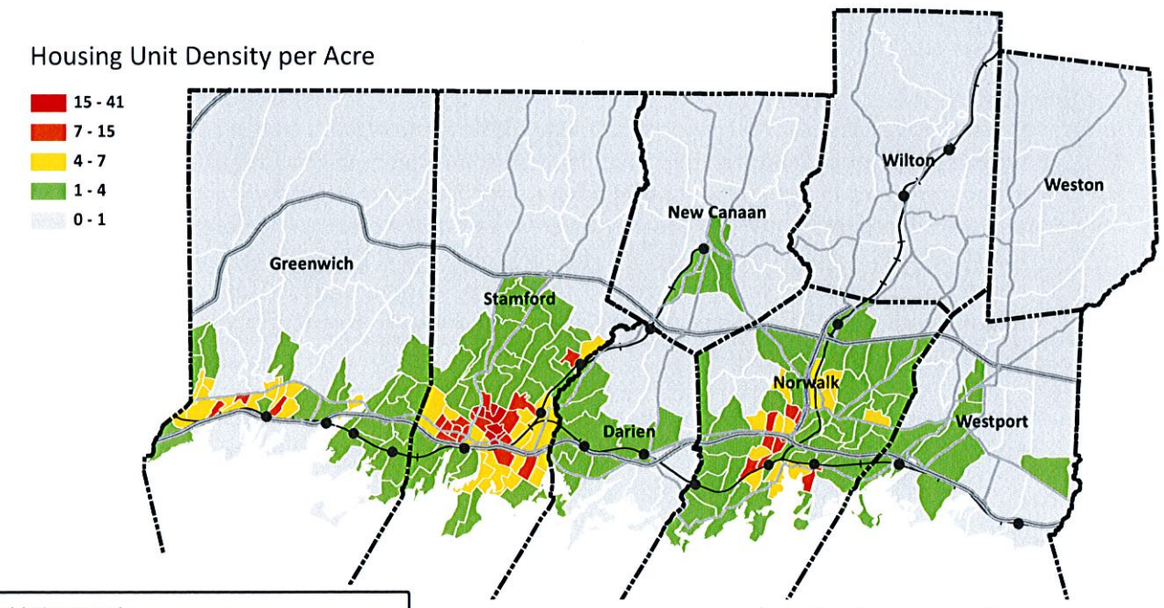
Select Demographic Characteristics, 2000

South Western Region Bicycle and Pedestrian Plan









Prepared on May 6, 2010

SWRPA

South Western Regional Planning Agency

Disclaimer: This map is intended for general planning purposes only.

Sources: Connecticut Department of Public Safety, Street Centerlines; Connecticut Department of Environmental Protection, Environmental GIS Data for Connecticut; US Census Bureau, 2000 Census of Population and Housing, Summary File 3.

N

0 1 2 4

Miles

Table 3. Bus commuters by municipality, 2000 & 2006 - 2011.

		2000	2006-2011	
Place	Count	%		
Darien	44	0.5%	11	0.1%
Greenwich	178	0.6%	114	0.4%
New Canaan	20	0.2%	0	0.0%
Norwalk	1,389	3.2%	1,635	3.6%
Stamford	2,765	4.6%	3,163	5.0%
Weston	0	0.0%	8	0.2%
Westport	35	0.3%	20	0.2%
Wilton	0	0.0%	40	0.5%
SW Region	4,431	2.6%	4991	2.9%
Connecticut	36,097	2.2%	43929	2.5%

Source: U.S. Census Bureau, 2000 Census of Population and Housing and 2006 – 2011 American Community Survey

All Connecticut Transit buses serving the Region are equipped with bicycle racks. Located at the front of the bus, the racks can carry two bicycles. Combining a bicycle and bus trip can greatly improve accessibility and mobility compared to using one of these modes alone; bicyclists can cover greater distances and avoid congested sections of highway or difficult terrain while bus users can access locations that are not within convenient walking distance of a bus stop. Since introduction of bicycle racks on buses in 2001, their use has grown steadily, peaking in 2008 (see table 3.) Average monthly bicycle boardings are highest in the summer and early fall and lowest in the winter months (see table 4.) During the cold winter months, bicycle boardings are 35% - 45% lower than during the peak summer months. All Norwalk Transit District fixed route buses are equipped with bike racks. However, no data on their utilization is presently available.

Table 4. Annual bicycle boardings on CTTransit – Stamford Division, 2001 - 2010

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Bicycle Boardings	28	786	848	1,516	5,058	7,103	6,752	7,630	6,650	3,064*

*through June 2010
Source: Connecticut Transit

Table 5. Average monthly bicycle boardings on CTTransit – Stamford Division, 2007 - 2010

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Avg. Bicycle Boardings	342	302	380	518	608	749	834	842	723	740	611	420

Source: Connecticut Transit

Figure 2. A bicycle on board a CTTransit bus outside the Stamford Transportation Center.[16]

Evidence from the Travel Data – Rail

According to data from Metro-North Railroad, there are more than 23,000 boardings on an average weekday at the nineteen rail stations in the region. Of that total, 14%, or about 3,500 riders, reported in a survey that they walk to the station. Although some may choose to walk to the station for simple convenience, others may walk due to the inability to obtain parking, which is in short supply at every station[17]. The survey reveals that Greenwich and Stamford have the greatest number of rail riders who walk to the station. This fits with census data that shows block groups near the Greenwich and Stamford central business districts (and near each community's rail stations) have high percentages of walk and bicycle commuters as well as households with no vehicle available. On the main line, East Norwalk and Riverside have the highest percentage of riders who walk to the station while Glenbrook and Merritt-7 lead the way on the branch lines.

Table 6. Average weekday Metro-North boardings by station and mode of access, 2009

Station	Boardings	Walk to Station	% Walk to Station
Cannondale	174	2	1%
Cos Cob	776	85	11%
Darien	1,354	190	14%
East Norwalk	591	165	28%
Glenbrook	332	126	38%
Greens Farms	656	20	3%
Greenwich	3,302	792	24%
Merritt 7	150	53	35%
New Canaan	1,167	128	11%
Noroton Heights	1,279	294	23%
Old Greenwich	899	216	24%
Riverside	688	206	30%
Rowayton	507	81	16%
South Norwalk	2,123	234	11%
Springdale	488	117	24%
Stamford	8,561	685	8%
Talmadge Hill	394	16	4%
Westport	2,213	89	4%
Wilton	168	0	0%
Total	23,441	3,410	15%

SWRPA's 2009 *South Western Region Rail Station Parking Study, Appendix C: Bicycle Storage* counted 158 bicycles parked at rail stations. This represents a bicycle parking capacity utilization of about 40%. In most instances, bicycle parking at rail stations is neither covered nor secure, characteristics which may discourage more Metro-North riders from taking their bicycles to the station. It is thought that more people might use a bicycle to access rail stations if more secure bicycle parking options were available. For instance, the Town of Fairfield offers bicycle lockers at its two rail stations through a subscription service for a fee and the City of New Haven makes available covered secure bicycle parking, which is over subscribed. For a more information about bicycle parking facilities, operations and utilizations at rail stations in the Region, please see the *Rail Station Parking Study*[18].

Figure 3. Pedestrians can access the Westport rail station via a unique path on the Saga rail bridge over the Saugatuck River.[19]

2-3: Who are Bike and Walk Commuters

Cross tab analysis of Census data reveals some of the demographic characteristics of the population of bike and walk commuters. This data aids in the understanding of who is the population of bike and walk commuters, one of the groups served by this plan.

Commuters may choose to bike or walk to work based on convenience, cost or health. They may also bike or walk out of necessity. Understanding the demographic distinctions between bike and walk commuters and all commuters may reveal possible reasons for using these modes. It may also reveal the audience to target in attempts to increase the use of bicycling and walking.

Method

Five-Percent Public Use Microdata Sample (PUMS) data for the 2000 Census was obtained from the Census' website[20]. The data covers two Public Use Microdata Areas[21] (PUMAs), which in aggregate are coterminous with the boundaries of the South Western Region. The dataset contains 16,797 records, or about 4.8% of the total 2000 Census population count. Data analysis was performed using STATA.

The first step in the analysis was to determine the means of transportation to work for all persons in the dataset. Persons who do not work or who worked at home were excluded, which reduced the total number of records to 7,484. Of this total, bike and walk commuters make up about 3.2% or 240 records. A breakdown by means of transportation to work is provided in Table 3.

The next step was to analyze the demographic characteristics of the commuting population relative to their means of transportation to work. For the purpose of this analysis, the demographic characteristics analyzed include the age, income, poverty, housing tenure, commute time and number of vehicles available. These demographic characteristics were considered because they may show distinctions between bike and walk commuters and all commuters. These characteristics are also relevant to transportation and land use planning.

Table 7. Means of Transportation to Work, 2000

Mode	Count	Percent
Car (alone and carpool)	6,120	81.8%
Railroad	820	11.0%
Bike+Walk	240	3.2%
Bus	211	2.8%
Other	93	1.2%
Total	**7,484**	**100.0%**

Source: U.S. Census Bureau, 2000 Census of Population and Housing, 5-Percent Public Use Microdata Sample (PUMS) Files

Results

The analysis revealed varying degrees of demographic difference between the population of bike and walk commuters and all commuters. In generally, bike and walk commuters tend to be younger, have lower incomes, rent rather than own their residences, have shorter commute times, and have fewer vehicles available.

In regards age, bike and walk commuters tend to be younger than the population of all commuters. The average age of a bike and walk commuter is 38.7 compared to 42.8 for all workers. The average age for bike commuters alone was 29.3. Approximately 34.7% of bike and walk commuters were under thirty compared to 21.2% of all commuters. Approximately 57.3% of all bike and walk commuters were under forty compared to 47.0% of all commuters. A breakdown of means of transportation to work by age is provided in Table 7.

Table 8. Means of Transportation to Work by Age, 2000

	Commuters	
Age	All	Bike+Walk
16 - 30	21.2%	34.7%
31 - 40	25.8%	22.7%
41 - 50	24.0%	19.1%
51 - 64	24.0%	20.4%
> 65	5.0%	3.1%
Mean	42.80	38.70

Source: U.S. Census Bureau, 2000 Census of Population and Housing, 5-Percent Public Use Microdata Sample (PUMS) Files

In regards income, bike and walk commuters have lower incomes than the population of all commuters. The per capita income for walk and bike commuters in 2000 was $49,511 versus $86,750 for all commuters. This figure is partially skewed by the income of railroad commuters (many of whom work in financial services in New York City,) which in 2000 was $176,531 per capita. Approximately 10.0% of bike and walk commuters had incomes greater than $100,000 in 2000 versus 21.8% of all commuters. A breakdown of means of transportation to work by income is provided in Table 8.

Table 9. Means of Transportation to Work by Income, 2000

	Commuters	
Income ($000s)	**All**	**Bike+Walk**
0 - 15	15.8%	34.6%
15 - 30	**18.2%**	**27.9%**
30 - 60	28.5%	20.8%
60 - 100	**15.7%**	**6.7%**
> 100	21.8%	10.0%
Mean ($)	86,750	49,511

Source: U.S. Census Bureau, 2000 Census of Population and Housing, 5-Percent Public Use Microdata Sample (PUMS) Files

In regards poverty, a greater percentage of walk and bike commuters live in poverty compared to all commuters. Approximately 9.6% of bike and walk commuters live below the poverty line compared to 3.1% of all commuters.

In regards housing tenure, bike and walk commuters are more likely to rent homes compared to the population of all commuters. Approximately 59.4% of bike and walk commuters rent their homes compared to 30.0% of all commuters.

In regards commute time, bike and walk commuters have significantly shorter commutes than does the population of all commuters. Approximately 61.1% of bike and walk commuters report commutes of ten minutes or shorter compared to 29.4% of all commuters. Bike and walk commuters had an average commute time of 12.5 minutes compared to 29.4 minutes for all commuters. A breakdown of means of transportation to work by commute time is provided in Table 8.

Table 10. Means of Transportation to Work by Commute Time, 2000

	Commuters	
Minutes	**All**	**Bike+Walk**
1-5	10.6%	36.7%
6-10	**18.8%**	**24.4%**
11-15	16.2%	16.3%
16-20	**14.0%**	**9.5%**
21-30	13.9%	8.6%
31-60	**14.5%**	**2.7%**
60+	12.0%	1.8%
Mean	29.4	12.5

Source: U.S. Census Bureau, 2000 Census of Population and Housing, 5-Percent Public Use Microdata Sample (PUMS) Files

Most (79%) bike and walk commuters have at least one vehicle available.

In regards the number of vehicles available to commuters, bike and walk commuters have fewer vehicles available and are more likely to have no vehicles available. Approximately 21.0% of bike and walk commuters have no vehicle available compared to 3.7% of all commuters. Further, approximately 52.5% of bike and walk commuters have one of fewer vehicles available compared to 26.3% of all commuters. About half of bike and walk commuters have two or more vehicles available. A breakdown of the number of vehicles available is provided in Table 9.

Table 11. Means of Transportation to Work by Number of Vehicles Available, 2000

	Commuters	
Vehicles available	**All**	**Bike+Walk**
0	3.7%	21.0%
1	**22.6%**	**31.5%**
2	46.9%	31.5%
3 or more	**26.8%**	**16.0%**
Mean	2.07	1.47

Source: U.S. Census Bureau, 2000 Census of Population and Housing, 5-Percent Public Use Microdata Sample (PUMS) Files

Analysis

Although a greater percentage of bike and walk commuters than all commuters have zero vehicles available, most (79%) bike and walk commuters have at least one vehicle available. This may indicate a deliberate decision on the part of many to bike or walk because of convenience, cost or health. Similarly, though bike and walk commuters generally have lower incomes than all commuters, a not insignificant percentage (16.7%) earned at least $60,000, which may indicate that their decision to walk or bike to work is based on factors other than cost, such as convenience. At the same time, the higher prevalence of poverty and low incomes earners among the population of bike and walk commuters may indicate than some commuters do rely on bicycling and walking out of necessity. The greater percentage of renters than owners may speak to the fact that bike and walk commuters are concentrated in downtown and town center areas where rental housing is more common. Shorter commute times among bike and walk commuters may indicate that these modes are most convenient for short trips.

3 – Safety

3-1: Introduction

In order to focus on the most critical locations, it is necessary to identify the street segments with the greatest concentration of bicycle or pedestrian crashes. Using CTDOT data, SWRPA located all bicycle- and pedestrian involved crashes on State highways and identified seven *Safety Corridors* with the highest crash rates. Within these corridors, accidents often follow a pattern. For example, a number of crashes at night or at a particular intersection may suggest that the location is insufficiently illuminated or that a crosswalk or signal timing may need improvement. For accident locations with a discernable pattern, this report recommends countermeasures, which may reduce accidents and improve safety.

Figure 4. Pedestrians cross US 1 (East Main Street) in Stamford.[22]

3-2: Methodology and Analysis

Method

Data for crashes involving a bicycle or pedestrian was obtained from Connecticut Department of Transportation's (CTDOT) Traffic Accident Viewing System (TAVS) application. The TAVS contains summary information regarding crashes occurring on the state highway system from 2003 through 2008. Accidents occurring on locally-maintained roads are not included in the database and are not considered in this report. For the purpose of this analysis, all crashes involving a pedestrian or bicycle[23] occurring on a state highway in the South Western Region for the three-year period from 2005 until 2007 as well as the first half of 2008 were selected from the database. Each accident was then plotted on the state highway network using the linear referencing tool in GIS.

Approximately two-thirds of all pedestrian-involved crashes and nearly half of all bicycled-involved crashes occurred on US 1

Once the accident data was georeferenced, summary data for each highway and municipality was generated. This summary data reveals that approximately two-thirds of all pedestrian-involved crashes and nearly half of all bicycled-involved crashes occurred on US 1, the most heavily traveled principal arterial in the South Western Region. US 1 serves a dual purpose as a principal arterial between communities and as a Main Street through many of the region's downtowns and neighborhood centers. The two municipalities with the highest number of crashes are Norwalk and Stamford. This is not surprising given that these communities have characteristics that are likely to generate bicycle and pedestrian trips, like mixed land uses, employment density, and persons who do not have access to a vehicle. Crashes in Norwalk and Stamford were primarily located along Route 1 and in Stamford along Route 137 as well.

Table 12. Bicycle and Pedestrian Crashes by Municipality and Highway, 2005 - 2008.

	Accidents	
Municipality	Bicycle	Pedestrian
Darien	5	9
Greenwich	8	20
New Canaan	5	4
Norwalk	22	32
Stamford	27	60
Weston	0	1
Westport	12	19
Wilton	4	2
Total	**83**	**147**

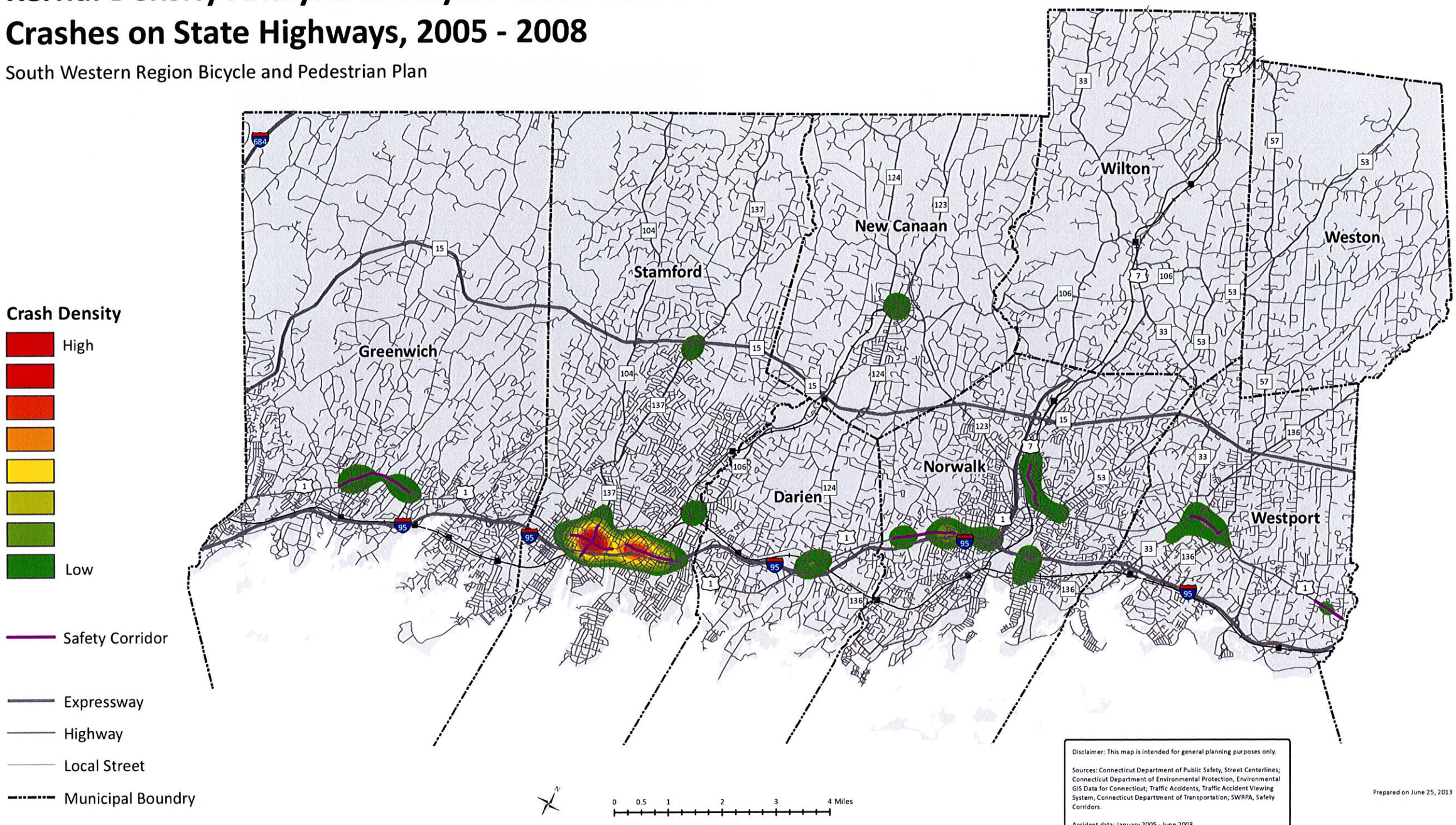
	Accidents	
Highway	Bicycle	Pedestrian
1	39	98
7	3	4
33	3	5
53	1	0
57	0	1
104	2	0
106	1	4
123	4	5
124	6	3
136	11	7
137	5	13
493	4	4
719	4	3
Total	**83**	**147**

GIS software was used to identify the corridor sections with the greatest density of crashes. Once georeferenced, all crashes involving bicycles and pedestrians were analyzed using the Kernal Density tool in Spatial Analyst, which measures the concentration of other crashes within one-quarter mile of a crash. Discrete highway sections with high concentrations of crashes were selected and are presented here as *Safety Corridors*. Because of their high concentration of crashes, *Safety Corridors* deserve additional attention. The result of the kernel density analysis and the extent of the *Safety Corridors* are shown in figure 2.

Figure 5. Pedestrians cross US 1 (Post Road East) in downtown Westport.[24]

Kernal Density Analysis of Bicycle- and Pedestrian-Motor Vehicle Crashes on State Highways, 2005 - 2008

South Western Region Bicycle and Pedestrian Plan



For each highway segment, an inventory of physical infrastructure, including sidewalks, crosswalks, medians and traffic islands, was collected. The infrastructure inventory is used to assess whether there exist any gaps in the pedestrian and bicycle network, which may contribute to crashes. The infrastructure inventory will also serve as a basis for formulating safety countermeasure recommendations in each corridor. The safety corridors are identified in Table 11.

Table 13. Safety Corridor Overview.

Corridor Name	Municipality	Route	From Street	To Street	Length (mile)	Speed Limit (mph)	Avg. ADT	------Accidents------ Bike	Ped.	Total	Accidents / Mile
Greenwich	Greenwich	1	Benedict Place	Indian Field Road	1.39	30	21,316	7	10	17	12.2
Tresser Boulevard	**Stamford**	**1**	**Rose Park Ave**	**Greyrock Place**	**0.65**	**25-30**	**21,400**	**7**	**12**	**19**	**29.2**
Washington Boulevard	Stamford	137 / 493	Station Place	Broad Street	0.66	25	22,733	7	7	14	21.2
East Main Street	**Stamford**	**1**	**Broad Street**	**Standish Road**	**0.89**	**30**	**21,002**	**5**	**26**	**31**	**34.8**
Connecticut Avenue	Norwalk	1	Shop-Rite	I-95 S exit 14	0.37	35	25,300	2	5	7	18.9
Main Street	**Norwalk**	**123**	**Cross Street**	**Ohio Ave**	**0.55**	**30**	**14,100**	**3**	**4**	**7**	**12.7**
Westport	Westport	33 / 1	Riverside Ave	Powers Court	0.55	25-30	20,049	2	7	9	16.4

The location of the *Safety Corridors* generally conforms to what Census and other data revealed about the location of bike and walk trips. Six of the seven *Safety Corridors* are located in Greenwich, Norwalk and Stamford, the three communities with the highest number of bike, walk and bus commuters and households with no vehicles available in the Region. Similarly, six of the seven *Safety Corridors* are located in downtowns, town centers or neighborhood main streets, which are areas more likely to generate bike and walk trips. Five of the corridors are located on US 1 while the other two corridors intersect US 1, the highway with the highest number of accidents in the region. In total, the seven *Safety Corridors* represent about 45% of all bicycle and pedestrian involved accidents in the region while only encompassing about 4% of the non-expressway highway mileage.

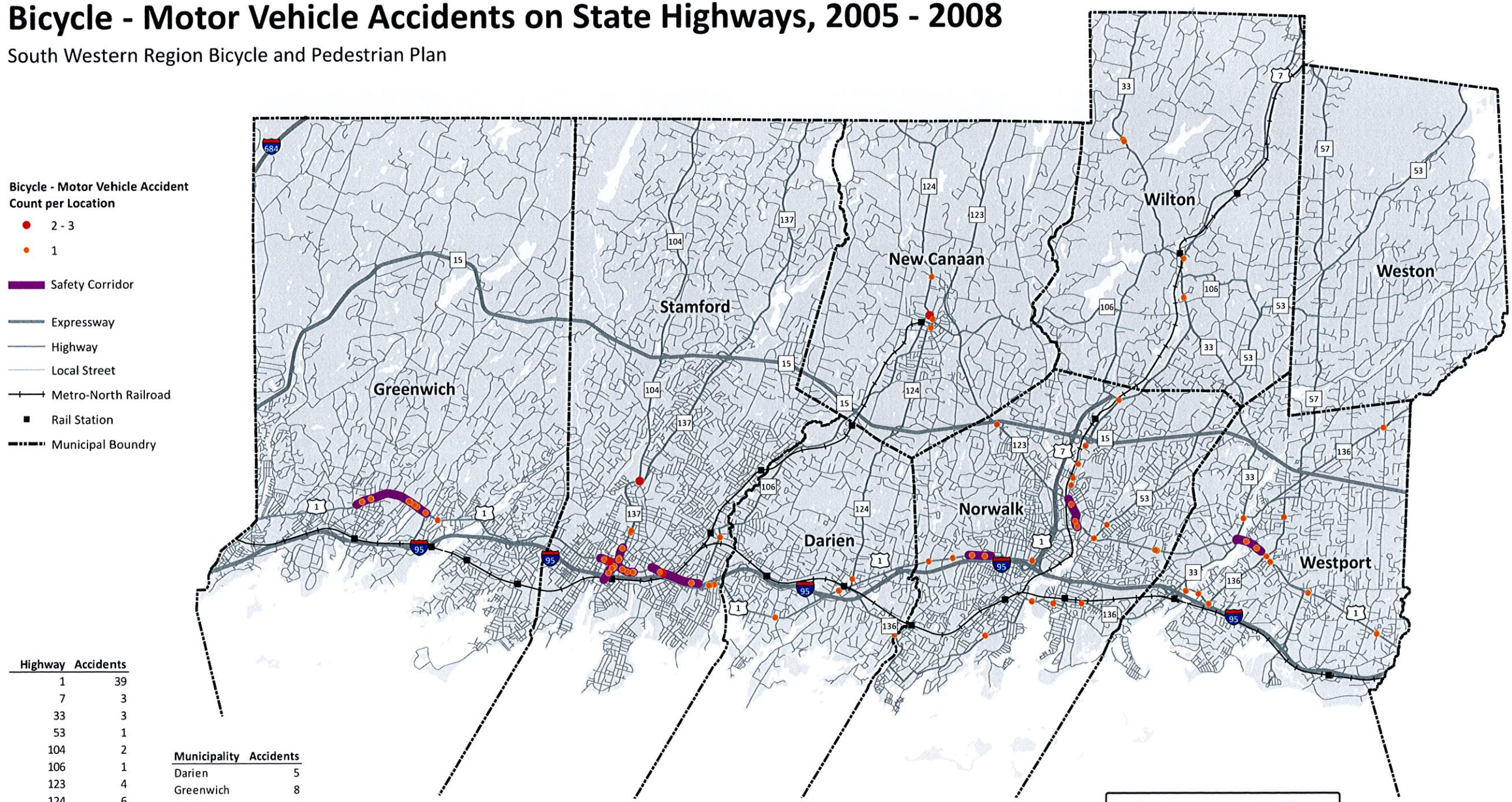
A more thorough description of each *Safety Corridors*, including detailed accident data, highway characteristics, land use, urban context, and a detailed map is presented later in this document. The geographical extent of all bicycle and pedestrian involved accidents and the location of the *Safety Corridors* is provided in figures 2 and 3.

The seven Safety Corridors *represent about 45% of all bicycle and pedestrian involved accidents in the region while only encompassing about 4% of the non-expressway highway mileage*

Accompanying each description are a set of recommended countermeasures. These countermeasures were determined based on a limited application of two FHWA documents: *BIKESAFE: Bicycle Countermeasure Section System* and *PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System*. An overview of some common types of bicycle and pedestrian safety countermeasures are organized by category and presented in the subsequent pages. In all circumstances, further detailed study of the identified *Safety Corridors* and analysis of the factors contributing to accidents in those corridors is strongly recommended.

Bicycle - Motor Vehicle Accidents on State Highways, 2005 - 2008

South Western Region Bicycle and Pedestrian Plan



Highway	Accidents
1	39
7	3
33	3
53	1
104	2
106	1
123	4
124	6
136	11
137	5
493	4
719	4
Total	**83**

Municipality	Accidents
Darien	5
Greenwich	8
New Canaan	5
Norwalk	22
Stamford	27
Westport	12
Wilton	4
Total	**83**

Disclaimer: This map is intended for general planning purposes only.

Sources: Connecticut Department of Public Safety, Street Centerlines; Connecticut Department of Environmental Protection, Environmental GIS Data for Connecticut; Traffic Accidents, Traffic Accident Viewing System, Connecticut Departtment of Transportation; SWRPA, Safety Corridors.

Accident data: January 2005 - June 2008

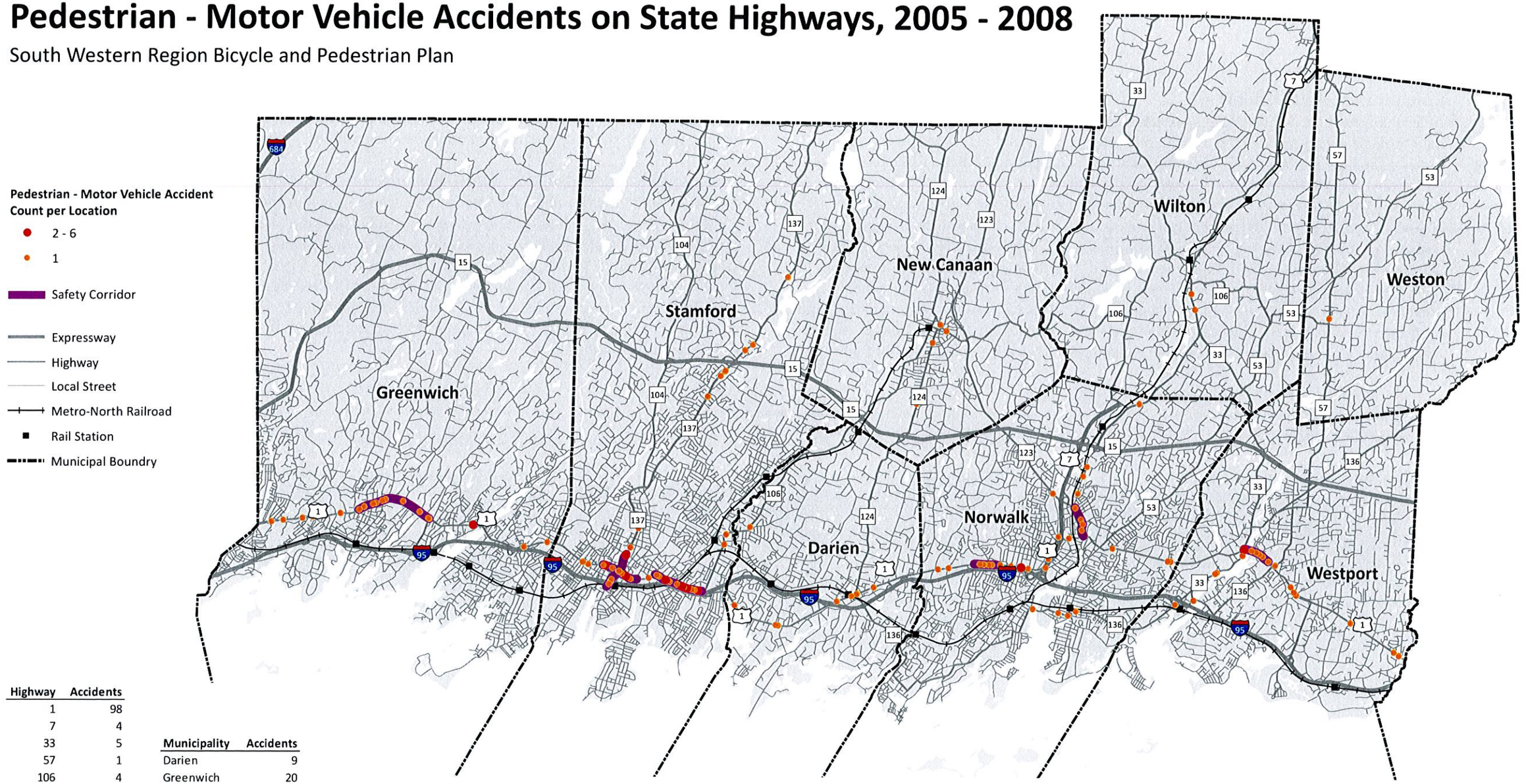
Prepared on May 11, 2010

SWRPA

South Western Regional Planning Agency

Pedestrian - Motor Vehicle Accidents on State Highways, 2005 - 2008

South Western Region Bicycle and Pedestrian Plan



Highway	Accidents
1	98
7	4
33	5
57	1
106	4
123	5
124	3
136	7
137	13
493	4
719	3
Total	**147**

Municipality	Accidents
Darien	9
Greenwich	20
New Canaan	4
Norwalk	32
Stamford	60
Weston	1
Westport	19
Wilton	2
Total	**147**

Disclaimer: This map is intended for general planning purposes only.

Sources: Connecticut Department of Public Safety, Street Centerlines; Connecticut Department of Environmental Protection, Environmental GIS Data for Connecticut; Traffic Accidents, Traffic Accident Viewing System, Connecticut Departtment of Transportation; SWRPA, Safety Corridors.

Accident data: January 2005 - June 2008

Prepared on May 11, 2010

SWRPA

South Western Regional Planning Agency

Countermeasure Overview

At locations where a safety problem has been identified, applying one or more countermeasure may reduce the number and severity of crashes involving automobiles and bicyclists and pedestrians. Safety countermeasures can be organized into three broad categories, which are commonly referred to as the three Es: *Engineering, Education and Enforcement*. *Engineering* covers improvements to physical infrastructure, such as sidewalks and other pedestrian facilities, signals, signage and roadway design. *Engineering* improvements are usually the domain of municipal public works departments or the state Department of Transportation. *Education* covers outreach, awareness, and information campaigns intended to inform all road users about the rules and responsibilities when traveling. *Education* campaigns may be supported by advocacy organizations, municipal and state agencies, schools, or any combination thereof. *Enforcement* covers actions by public safety agencies to enforce traffic laws and make road users aware of the rules through warnings or citations. *Enforcement* is the responsibility of the local police department in cooperation with the court system and transportation officials.

The FHWA publications *BIKESAFE: Bicycle Countermeasure Section System* and *PEDSAFE: Pedestrian Safety Guide and Countermeasure Selection System* divides countermeasures into numerous categories. Countermeasures recommended by this plan fall into the following categories: Pedestrian Facility Design; Roadway Design; Intersection Design; Traffic Calming; Traffic Management; Signals and Signs; and Other Measures. The first six categories represent engineering measures while the last category ('Other Measures') encompasses education and enforcement measures. However, this should not minimize the importance of education and enforcement, which are necessary components of any effort to improve bicycle and pedestrian safety.

Pedestrian Facility Design – This category includes measures commonly associated with walking such as sidewalks, curb ramps and marked crosswalks as well as other features like transit stop treatments and roadway lighting.

Figure 9. Sidewalk and Curb Ramp[25]

Figure 10. Highly Visible Crosswalk[26]

Figure 11. Sidewalk with Landscaping[27]

Roadway Design – This category includes elements such as bicycling lanes, road narrowing and lane reduction, raised medians, and modifications to curb radii and right-turn slip lane design.

Figure 12. Pedestrian Island and Crosswalk[28]

Figure 13. Sidewalk Bulb-Out[29]

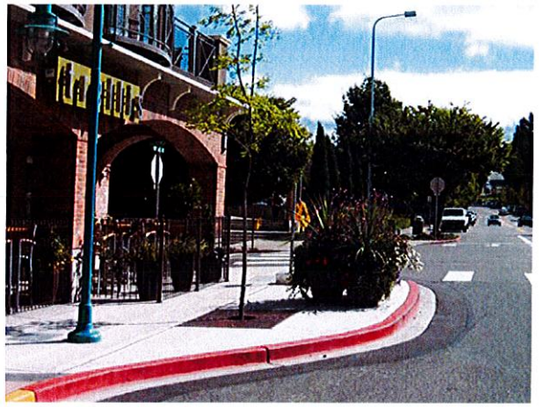


Figure 14. Bicycle Lane and an Urban Curb Radius[30]

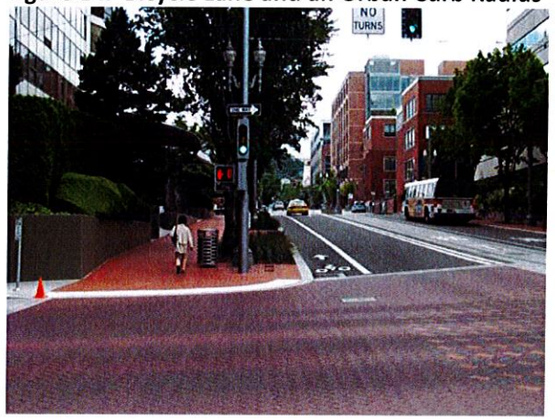
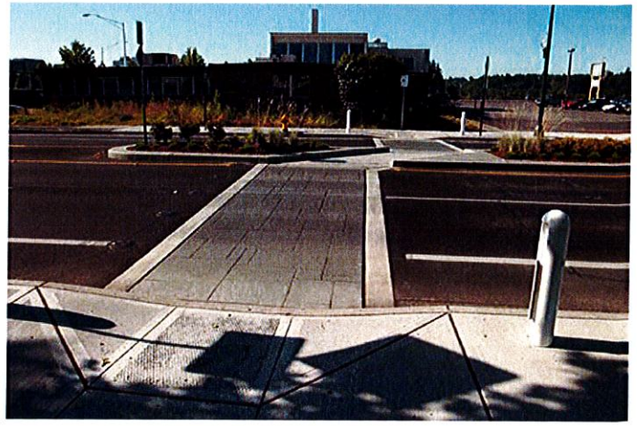


Figure 15. Additional Sidewalk from Lane Reduction[31]

Figure 16. Pedestrian Island and Crosswalk[32]

Figure 17. Pedestrian Island, Curb Ramp and Crosswalk[33]



Intersection Design – This category includes elements such as modified T-intersections and intersection median barriers

Figure 18. Diverters at a Four Way Intersection[34]

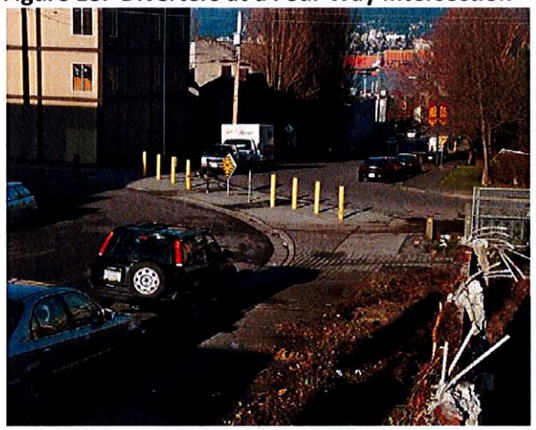


Figure 19. Partial Street Closure near Intersection[35]

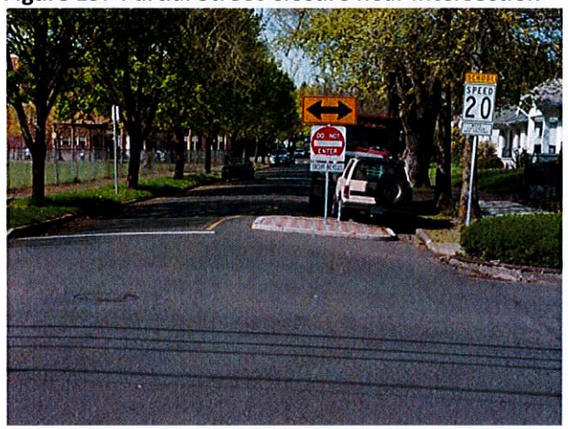


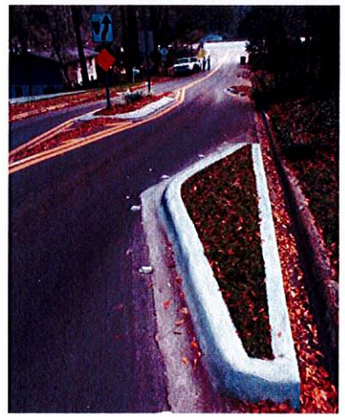
Figure 20. Roundabout with Ped. Accommodation[36]

Traffic Calming and Traffic Management – This category includes elements such as curb extensions (bulb outs), crossing islands, chicanes, speed humps and tables, raised intersections and pedestrian crossings, landscaping, diverters on residential streets and pedestrian malls.

Figure 21. Speed Hump and Landscaped Choker[37]

Figure 22. Landscaped Median[38]

Figure 23 Chicane[39]



Signals, Signs and Markings – This category includes elements such as traffic signals and signal timing (including pedestrian signals), right-turn-on-red restrictions, advanced stop lines and signage.

Figure 24. Pedestrian Countdown Signal[40]

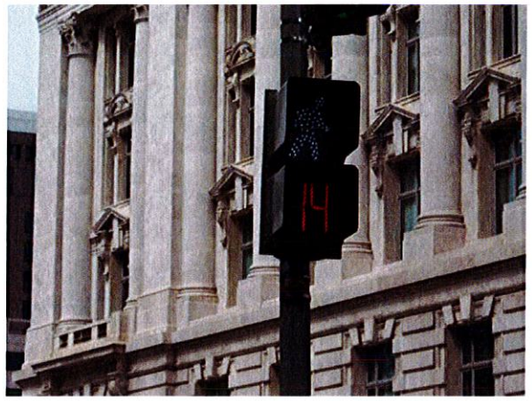
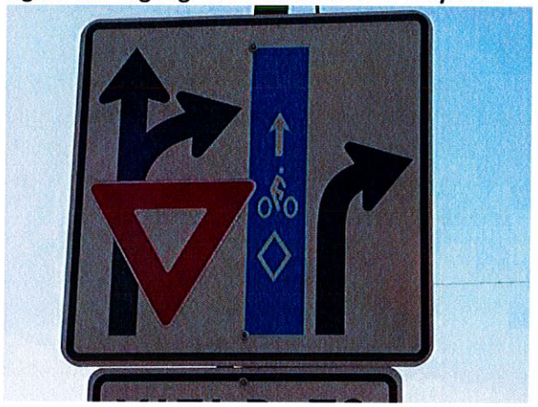


Figure 25. In-Road Pedestrian Warning Sign[41]

Figure 26. Signage for Motorists and Bicyclists[42]

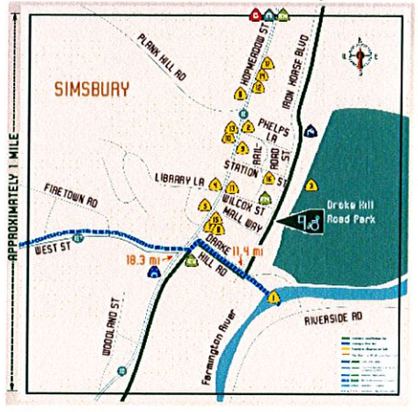


Other Measures – This category includes elements such as on-street parking enhancements, multi use trails and maps.

Figure 27. Bicycle Lane Protected by Parking[43]

Figure 28. Bicycle Directional Signage[44]

Figure 29. Multi-Use Trail Map[45]



Education and Enforcement – This category includes actions by public safety agencies to enforce traffic laws as well as efforts to educate all road users about rules and responsibilities.

Unlike engineering countermeasures, education and enforcement strategies are not generally tied to specific locations. Enforcement actions may target a stretch of road or a single intersection but the intended cumulative effect is to enforce pedestrian, bicyclist or motorist behavior wherever and whenever they travel. Education campaigns are usually broadly focused either at a neighborhood or municipal level or at a specific segment of the population, such as school children or the elderly.

Enforcement – Police enforcement of traffic laws should be directed at motorists, bicyclists and pedestrians whose behavior creates a hazardous condition for other road users. For the enforcement effort to be successful, it is necessary for officers to be familiar with factors contributing to accidents involving and traffic laws as they apply to bicyclists and pedestrians. Fortunately, many South Western Region communities already have an officer or section devoted to traffic enforcement. The goal of any enforcement program should be to educate, change behavior, and improve safety, not be punitive or raise revenue.

Generally, traffic violations that create the most conflict between vehicles, bicycles and pedestrians include speeding on residential streets or streets used by bicyclists and pedestrians, red light running at intersections, and passing maneuvers. Other violations that put bicyclists and pedestrians at risk include riding against or walking with traffic (for bicyclists and pedestrians, respectively), ignoring stop signs or signals, and riding or walking without proper illumination or attire at night.

In Connecticut, recent legislative accomplishments include a three-foot rule. This statue mandates that vehicles maintain a safe distance of at least three feet when overtaking a person riding a bicycle[46].

Education – Education is part of a continuous, broadly focused strategy to comprehensively improve bicycle and pedestrian safety. Education activities should start at an early age, targeting school-aged children who often rely on bicycling and walking to travel to school and visit friends. Basic instruction, bike rodeos and helmet giveaways are common parts of an effort to teach children how to properly use a bicycle. As children mature into drivers, they should be reminded of their responsibilities and the rules of the road. In Connecticut, the driver's manual includes sections explaining how motorists are to share the road with bicycles and pedestrians.

Another important means to promote safety through education are share the road campaigns. The purpose of a share the road campaign is to make all road users more aware of and respect one another. Share the road campaigns are often pursued in order to promote a change in the 'culture'. As part of the law that mandated the three foot rule, CTDOT has rolled out a share the road campaign. This campaign has been promoted through advertisements on the back of transit buses, public service announcements, and a website. A sample of CTDOT's share the road message is below:

Figure 30. CTDOT Share the Road Message, 2009

3-3: Description of Safety Corridors

Greenwich

Description

Route:	US 1 (West and East Putnam Avenue)
Length	1.39 miles
Location:	From Benedict Place near downtown Greenwich to Indian Field Road in Cos Cob.
Roadway:	Four lanes with turning lanes at intersections
Speed Limit:	30 mph
ADT:	18,300 – 27,900 (average: 21,316)
Infrastructure:	Sidewalks and crosswalks are present throughout the corridor, with the notable exception of section between Old Church Road and Hillside Road in front of Greenwich High School
Land Use:	The western end of the corridor is composed of comparatively denser, urban land use, with street parking and buildings fronting on the sidewalk. Moving east, the corridor becomes less dense and more suburban in character.
Landmarks:	Greenwich Public Library, Downtown Greenwich / Greenwich Avenue, Greenwich Family YMCA, Greenwich High School
Crashes:	17 (12.2/mile) Bike: 7 Pedestrian: 10 Detailed listing available in table 12.

Countermeasures

- Both crashes recorded at mile point 1.93 near the US 1 (West Putnam Avenue) intersections with Lafayette Court and Greenwich Avenue occurred at night. This may indicate the need for improved lighting at this location. Along with lighting, crosswalks should be marked or re-marked with highly visible material. Given this location is an important node in Greenwich's central business district, curb extensions could not only improve pedestrian safety but could also improve the streetscape of the intersection.

- The crashes at mile post 2.15 (Washington Avenue) and mile post 2.27 (Maher Avenue) both occurred at intersections with crosswalks across US 1 (East Putnam Avenue). The Washington Avenue intersection is unsignalized and close to a busy grocery store. At Maher Avenue, there is only one stripped crosswalk on the south (west) side of the intersection. A new crosswalk and modified stop line at Maher Avenue, if feasible, could improve safety at these locations.

- A number of bicycle crashes were recorded on the segment of US 1 (East Putnam Avenue) near Greenwich High School east of mile post 2.83 (Overlook Drive intersection). Stripping a bicycle lane or shoulder here along with "share the road" signage could make this stretch more bicycle friendly.

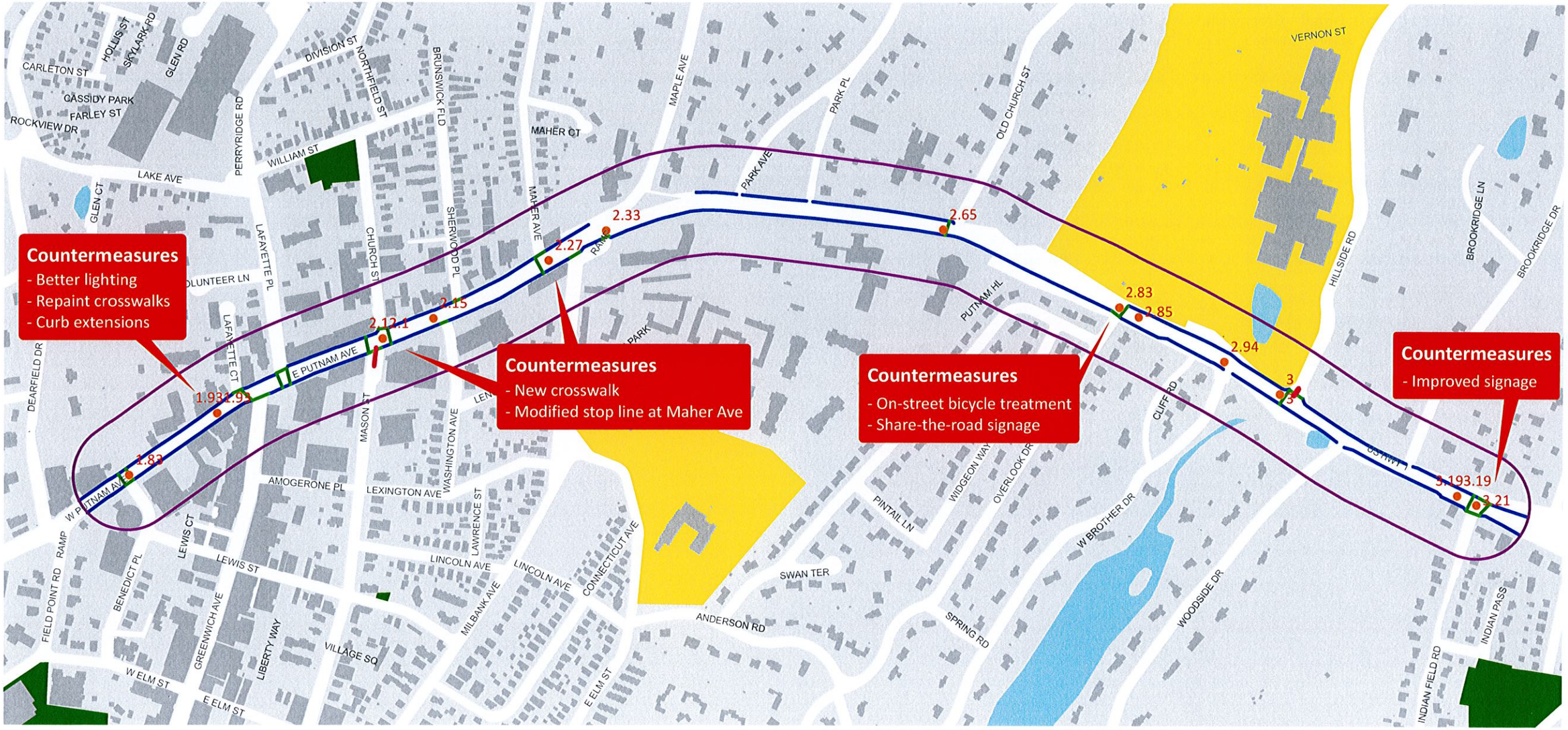
- A number of crashes were recorded at the intersection of US 1 (East Putnam Avenue) and Indian Field Road. Improved signage could improve safety at this location. Curb extensions could shorten the distance pedestrians have to cross and make them more visible to motorists.

Table 14. Crash Detail – Greenwich Safety Corridor.

Safety Corridor	Route	Mile Post	Case #	Day	Time	Light Condition	Road Surface	Fault Vehicle	Non Fault Vehicle(s)	Contributing Factor	Injury
Greenwich	1	1.83	108923	Friday	12.38	Daylight	Dry	Pedestrian	Tractor Semi-Trailer	Unsafe Use of Highway by Pedestrian	Not Injured
Greenwich	1	1.93	126246	Tuesday	00.29	Dark Lighted	Dry	Unknown	Pedalcycle	Failed to Grant Right of Way	Non-Incapacitating Evident Injury
Greenwich	1	1.93	132533	Sunday	00.04	Dark Lighted	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Non-Incapacitating Evident Injury
Greenwich	1	2.10	125270	Friday	12.18	Daylight	Dry	Automobile	Pedestrian	Violated Traffic Control	Possible Injury
Greenwich	1	2.10	142276	Monday	18.40	Daylight	Dry	Pedalcycle	Automobile	Violated Traffic Control	Not Injured
Greenwich	1	2.15	181592	Saturday	16.05	Daylight	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Non-Incapacitating Evident Injury
Greenwich	1	2.27	117875	Wednesday	09.13	Daylight	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Non-Incapacitating Evident Injury
Greenwich	1	2.33	180717	Tuesday	15.44	Daylight	Dry	Emergency Vehicle	Pedestrian	Driver's View Obstructed	Not Injured
Greenwich	1	2.65	178778	Thursday	20.19	Dark Lighted	Dry	Truck Tractor Only	Pedestrian	Violated Traffic Control	Possible Injury
Greenwich	1	2.83	125889	Saturday	13.52	Daylight	Dry	Automobile	Pedalcycle	Failed to Grant Right of Way	Non-Incapacitating Evident Injury
Greenwich	1	2.85	114765	Tuesday	17.43	Daylight	Dry	Automobile	Pedalcycle	Failed to Grant Right of Way	Possible Injury
Greenwich	1	2.94	196570	Tuesday	15.01	Daylight	Dry	Automobile	Pedalcycle	Violated Traffic Control	Not Injured
Greenwich	1	3.00	113724	Thursday	15.18	Daylight	Dry	Pedestrian	Automobile	Violated Traffic Control	Possible Injury
Greenwich	1	3.00	177808	Sunday	11.54	Daylight	Dry	Pedalcycle	Automobile	Driving on Wrong Side of Road	Non-Incapacitating Evident Injury
Greenwich	1	3.19	142931	Friday	16.59	Daylight	Dry	Automobile	Pedalcycle	Failed to Grant Right of Way	Not Injured
Greenwich	1	3.19	152843	Tuesday	07.35	Daylight	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Incapacitating Injury
Greenwich	1	3.21	122099	Thursday	12.03	Daylight	Dry	Automobile	Pedestrian	Violated Traffic Control	Non-Incapacitating Evident Injury

Greenwich Safety Corridor - US 1 (Putnam Avenue)

South Western Region Bicycle and Pedestrian Plan



Disclaimer: This map is intended for general planning purposes only.

Sources: Connecticut Department of Public Safety, Street Centerlines; Connecticut Department of Environmental Protection, Environmental GIS Data for Connecticut; Traffic Accidents, Traffic Accident Viewing System, Connecticut Departtment of Transportation; Town of Greenwich, Tax Properties.

Accident data: January 2005 - June 2008

Prepared on June 8, 2011

SWRPA

South Western Regional Planning Agency

Tresser Boulevard (Stamford)

Description

Route:	US 1 (Tresser Boulevard)
Length	0.65 miles
Location:	From Rose Park Avenue on the West Side of Stamford to Grey Rock Place near the Stamford Town Center (Mall.)
Roadway:	Two lanes east of Greenwich Avenue, six lanes with turning lanes at intersections otherwise.
Speed Limit:	25 - 30 mph
ADT:	12,200 – 26,500 (average: 21,400)
Infrastructure:	Sidewalks and crosswalks are present throughout the corridor.
Land Use:	The small segment east of Greenwich Avenue is composed of neighborhood scaled urban land uses, including multi-family residential and retail, with street parking and buildings fronting on the sidewalk. The rest of the corridor is characterized by large office buildings and a shopping mall that make up Stamford's Central Business District.
Landmarks:	Mill River Greenway, Stamford Government Center, Rich Forum, Stamford Town Center (mall)
Crashes:	19 (29.2/mile) Bike: 7 Pedestrian: 12 Detailed listing available in table 13.

Countermeasures

- A number of crashes were recorded near the intersection of US 1 (West Main Street) and Stillwater Avenue (mile posts 6.64 to 6.67), most of which occurred during dark conditions. This may indicate the need for improved lighting at this location. At the intersection of US 1 (Tresser Boulevard) and Greenwich Avenue, a recently completed project that removed the slip ramps should make the location safer. Long-term plans for a roundabout here should further enhance pedestrian safety and create a gateway between the West Side and Downtown Stamford.

- Five crashes have been recorded at the intersection of US 1 (Tresser Boulevard) and Atlantic Street (mile post 7.08). Four of the crashes were attributed to either a pedestrian crossing against the signal or a vehicle turning left. If feasible, adding median islands to US 1 that force pedestrians to look for oncoming traffic as they cross could improve safety at this location.

- At mile post 7.18, two crashes were recorded and both were attributable to vehicles failing to grant the right-of-way to pedestrians. This location contains an intersection to access the mall parking garage and an office building. Signage altering motorists of pedestrians and vice versa could improve safety at this location. More urban curb radii may also be warranted.

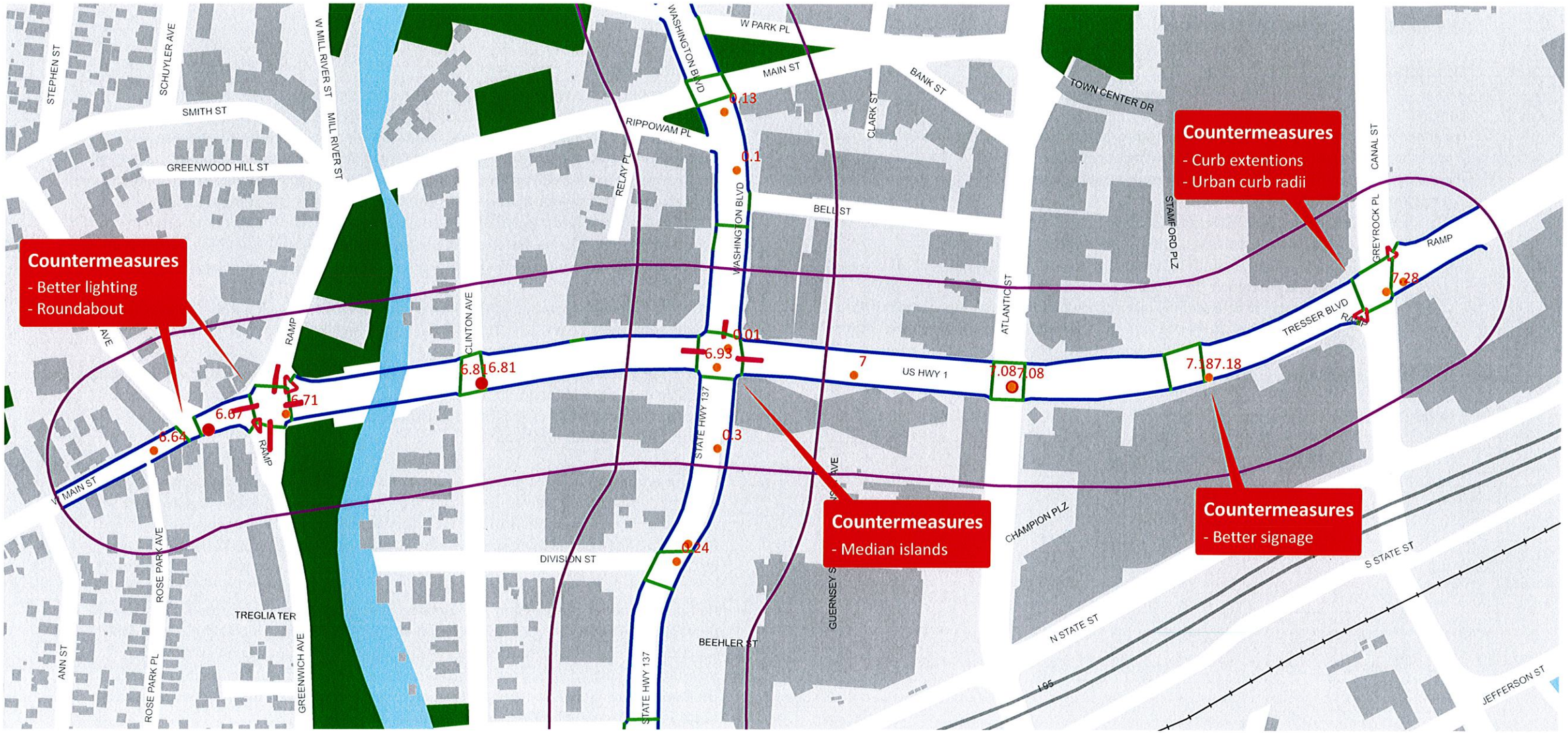
- Two crashes were recorded at the intersection of US 1 (Tresser Boulevard) and Greyrock Place, both involving bicycles. Replacing the right-turn slip ramps with a curb extension with an urban curb radii could improve both the safety and streetscape of this intersection.

Table 15. Crash Detail – Tresser Boulevard Safety Corridor.

Safety Corridor	Route	Mile Post	Case #	Day	Time	Light Condition	Road Surface	Fault Vehicle	Non Fault Vehicle(s)	Contributing Factor	Injury
Tresser Blvd	1	6.64	129954	Wednesday	20.25	Dark Lighted	Dry	Automobile	Pedestrian	Failed to Grant Right of Way	Possible Injury
Tresser Blvd	**1**	**6.67**	**122617**	**Thursday**	**20.41**	**Dark-Not Lighted**	**Dry**	**Automobile**	**Pedestrian**	**Unknown**	**Non-Incapacitating Evident Injury**
Tresser Blvd	1	6.67	138135	Friday	11.30	Daylight	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Possible Injury
Tresser Blvd	**1**	**6.67**	**983156**	**Monday**	**18.31**	**Dark Lighted**	**Dry**	**Automobile**	**Pedestrian**	**Under the Influence**	**Fatal Injury**
Tresser Blvd	1	6.71	147943	Monday	15.05	Daylight	Dry	Passenger Van	Pedalcycle	Failed to Grant Right of Way	Not Injured
Tresser Blvd	**1**	**6.81**	**127313**	**Monday**	**18.00**	**Daylight**	**Dry**	**Pedestrian**	**Automobile**	**Unsafe Use of Highway by Pedestrian**	**Non-Incapacitating Evident Injury**
Tresser Blvd	1	6.81	143620	Friday	11.00	Daylight	Dry	Automobile	Pedalcycle	Unsafe Right Turn on Red	Non-Incapacitating Evident Injury
Tresser Blvd	**1**	**6.81**	**150384**	**Tuesday**	**07.45**	**Daylight**	**Dry**	**Pedalcycle**	**Automobile**	**Driving on Wrong Side of Road**	**Non-Incapacitating Evident Injury**
Tresser Blvd	1	6.93	172642	Thursday	08.37	Daylight	Dry	Automobile	Pedestrian	Failed to Grant Right of Way	Possible Injury
Tresser Blvd	**1**	**7.00**	**131453**	**Wednesday**	**16.22**	**Daylight**	**Dry**	**Pedestrian**	**Pedestrian, Automobile**	**Unsafe Use of Highway by Pedestrian**	**Incapacitating Injury**
Tresser Blvd	1	7.08	118487	Friday	19.40	Dark Lighted	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Non-Incapacitating Evident Injury
Tresser Blvd	**1**	**7.08**	**152278**	**Sunday**	**10.00**	**Daylight**	**Wet**	**Pedestrian**	**Automobile**	**Unsafe Use of Highway by Pedestrian**	**Possible Injury**
Tresser Blvd	1	7.08	156819	Saturday	02.30	Dark Lighted	Wet	Automobile	Pedestrian	Failed to Grant Right of Way	Non-Incapacitating Evident Injury
Tresser Blvd	**1**	**7.08**	**160581**	**Tuesday**	**20.30**	**Dark-Not Lighted**	**Wet**	**Automobile**	**Pedestrian**	**Failed to Grant Right of Way**	**Possible Injury**
Tresser Blvd	1	7.08	173011	Tuesday	16.02	Daylight	Wet	Pedalcycle	Passenger Van	Violated Traffic Control	Non-Incapacitating Evident Injury
Tresser Blvd	**1**	**7.18**	**156941**	**Tuesday**	**12.38**	**Daylight**	**Dry**	**Automobile**	**Pedestrian**	**Violated Traffic Control**	**Possible Injury**
Tresser Blvd	1	7.18	194501	Thursday	18.30	Dark-Not Lighted	Dry	Automobile	Pedalcycle	Failed to Grant Right of Way	Not Injured
Tresser Blvd	**1**	**7.28**	**186792**	**Saturday**	**15.15**	**Daylight**	**Dry**	**Automobile**	**Pedalcycle**	**Failed to Grant Right of Way**	**Non-Incapacitating Evident Injury**
Tresser Blvd	1	7.29	141572	Tuesday	10.06	Daylight	Dry	Automobile	Pedalcycle	Violated Traffic Control	Possible Injury

Tresser Boulevard Safety Corridor - US 1

South Western Region Bicycle and Pedestrian Plan



Safety Corridor
2 - 8
1
Sidewalk
Crosswalk
Median / Traffic Island

Expressway
Highway
Local Street
Metro-North Railroad
Rail Station

Parks & Open Space
Public School
Buildings
Municipal Boundry

N

0 0.05 0.1 0.2
Miles

Disclaimer: This map is intended for general planning purposes only.

Sources: Connecticut Department of Public Safety, Street Centerlines; Connecticut Department of Environmental Protection, Environmental GIS Data for Connecticut; Traffic Accidents, Traffic Accident Viewing System, Connecticut Departtment of Transportation.

Accident data: January 2005 - June 2008

Prepared on June 08, 2010

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Washington Boulevard (Stamford)

Description

Route:	CT 493 and CT 137 (Washington Boulevard)
Length	0.66 miles
Location:	From Station Place at the Stamford Transportation Center to Broad Street near the University of Connecticut campus.
Roadway:	Four lanes with turning lanes at intersections.
Speed Limit:	25 mph
ADT:	15,300 – 26,000 (average: 22,733)
Infrastructure:	Sidewalks and crosswalks are present throughout the corridor.
Land Use:	Stamford Transportation Center, the region's most important mass transit facility, is located at the southern end of the corridor. The rest of the corridor is characterized by large office buildings that make up Stamford's Central Business District as well as some smaller commercial uses, high density residential buildings, and a University of Connecticut campus.
Landmarks:	Stamford Transportation Center, Stamford Government Center, Columbus Park, University of Connecticut campus
Crashes:	14 (21.2/mile) Bike: 7 Pedestrian: 7 Detailed listing available in table 14.

Countermeasures

- A number of crashes were recorded near the intersections of CT 493 (Washington Boulevard), North State Street and Richmond Hill Avenue. During 2009, a new, large office building opened here, which has increased the pedestrian traffic at these intersections. However, the developer and City of Stamford agreed to make improvements to the intersection, including new signals, signal timings, traffic patterns and repainted crosswalks. Future plans call for rebuilding this section of CT 493 (Washington Boulevard), including construction of a new median barrier to prevent pedestrians from crossing the street at unsafe locations. A similar median barrier is in place on CT 137 (Washington Boulevard) north of US 1 (Tresser Boulevard).

- Three crashes were recorded at the intersection of CT 137 (Washington Boulevard) and Broad Street (mile post 0.32). This intersection is close to new a high density residential development as well as the UConn-Stamford campus. Two crashes were attributed to a pedestrian crossing against the signal and one crash was attributed to a driver operating a vehicle under the influence of drugs or alcohol. If feasible, adding median islands to this intersection that force crossing pedestrians to look for oncoming traffic could improve safety at this location.

  For the *South Western Region Bicycle and Pedestrian Safety Corridor Study*, a before-and-after visualization was prepared to show what median islands and bicycle lanes would look like at the intersection of CT 137 (Washington Boulevard) and Tresser Boulevard. The visualizations are reproduced in this report on page 47 (figures 34 and 35).

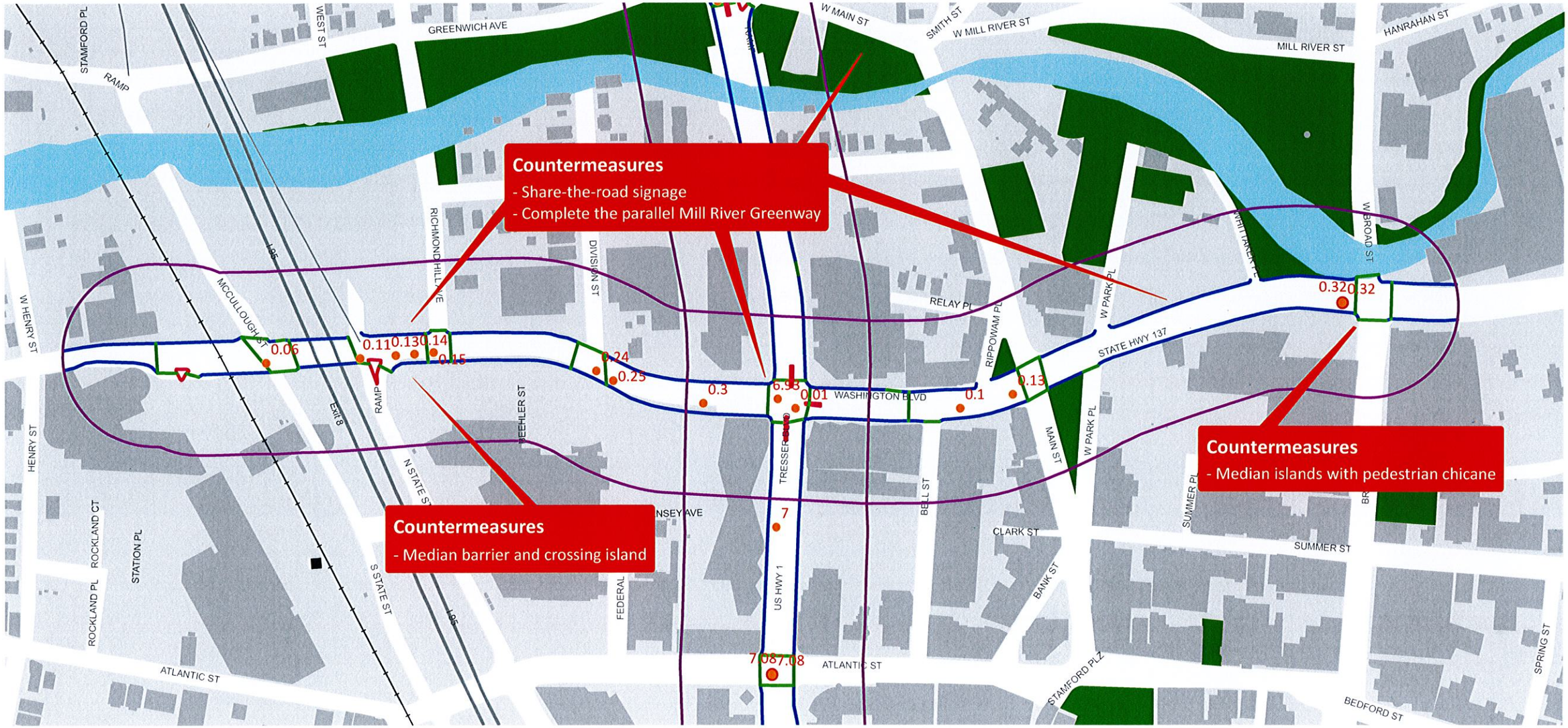
- Half of the crashes recorded on this corridor involved bicycles. This is the highest percentage of any safety corridor included in this plan. Given this corridor's important function as a connecting route between the Stamford Transportation Center and downtown Stamford, improved signage and pavement markings altering motorists to the presence of bicyclists may be warranted. Finishing the Mill River Greenway north to Scalzi Park will create a safer parallel route for bicyclists.

Table 16. Crash Detail – Washington Boulevard Safety Corridor.

Safety Corridor	Route	Mile Post	Case #	Day	Time	Light Condition	Road Surface	Fault Vehicle	Non Fault Vehicle(s)	Contributing Factor	Injury
Washington Blvd	493	0.06	111616	Wednesday	20.17	Dark Lighted	Dry	Automobile	Pedestrian	Failed to Grant Right of Way	Possible Injury
Washington Blvd	**493**	**0.11**	**139624**	**Tuesday**	**18.00**	**Daylight**	**Dry**	**Automobile**	**Pedestrian**	**Unknown**	**Non-Incapacitating Evident Injury**
Washington Blvd	493	0.13	103564	Tuesday	10.52	Daylight	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Possible Injury
Washington Blvd	**493**	**0.14**	**156082**	**Thursday**	**07.03**	**Daylight**	**Dry**	**Pedalcycle**	**Commercial Bus**	**Improper Turning Maneuver**	**Non-Incapacitating Evident Injury**
Washington Blvd	493	0.15	142009	Saturday	14.55	Daylight	Wet	Pedestrian	Single Unit Truck (2 Axle, 4 Tire)	Unsafe Use of Highway by Pedestrian	Possible Injury
Washington Blvd	**493**	**0.24**	**184009**	**Friday**	**06.11**	**Dark Lighted**	**Dry**	**Pedalcycle**	**Automobile**	**Violated Traffic Control**	**Possible Injury**
Washington Blvd	493	0.25	134446	Sunday	17.10	Daylight	Dry	Automobile	Pedalcycle	Failed to Grant Right of Way	Non-Incapacitating Evident Injury
Washington Blvd	**493**	**0.30**	**135827**	**Sunday**	**17.10**	**Daylight**	**Dry**	**Automobile**	**Pedalcycle**	**Failed to Grant Right of Way**	**Non-Incapacitating Evident Injury**
Washington Blvd	137	0.01	101878	Wednesday	15.09	Daylight	Dry	Automobile	Pedestrian	Driver's View Obstructed	Non-Incapacitating Evident Injury
Washington Blvd	**137**	**0.10**	**173251**	**Wednesday**	**16.30**	**Daylight**	**Dry**	**Automobile**	**Pedalcycle**	**Failed to Grant Right of Way**	**Possible Injury**
Washington Blvd	137	0.13	115322	Thursday	15.40	Daylight	Dry	Pedalcycle	Automobile	Violated Traffic Control	Possible Injury
Washington Blvd	**137**	**0.32**	**113663**	**Saturday**	**12.20**	**Daylight**	**Dry**	**Passenger Van**	**Pedestrian**	**Violated Traffic Control**	**Possible Injury**
Washington Blvd	137	0.32	120148	Sunday	13.41	Daylight	Dry	Pedestrian	Emergency Vehicle	Violated Traffic Control	Non-Incapacitating Evident Injury
Washington Blvd	**137**	**0.32**	**148899**	**Wednesday**	**20.16**	**Dark Lighted**	**Dry**	**Pedalcycle**	**Automobile**	**Under the Influence**	**Non-Incapacitating Evident Injury**

Washington Boulevard Safety Corridor - CT 137 / CT 493

South Western Region Bicycle and Pedestrian Plan



Safety Corridor
2 - 8
1
Sidewalk
Crosswalk
Median / Traffic Island

Expressway
Highway
Local Street
Metro-North Railroad
Rail Station

Parks & Open Space
Public School
Buildings
Municipal Boundry

0 200 400 800
Feet

Disclaimer: This map is intended for general planning purposes only.

Sources: Connecticut Department of Public Safety, Street Centerlines; Connecticut Department of Environmental Protection, Environmental GIS Data for Connecticut; Traffic Accidents, Traffic Accident Viewing System, Connecticut Departtment of Transportation.

Accident data: January 2005 - June 2008

Prepared on June 8, 2011

SWRPA
South Western Regional Planning Agency

Figure 34 and 35: For the *South Western Region Bicycle and Pedestrian Safety Corridor Study*, a before (left) and after (right) visualization was prepared to show what median islands and bicycle lanes would look like at the intersection of CT 137 (Washington Boulevard) and Tresser Boulevard. The view here is from CT 137 (Washington Boulevard) looking south[47] [48].

East Main Street (Stamford)

Description

Route:	US 1 (East Main Street)
Length	0.89 miles
Location:	From Broad Street to Courtland Avenue near the I-95 south entrance.
Roadway:	Four lanes with turning lanes at intersections between Broad Street and Glenbrook Road, thereafter two lanes to Lockwood Avenue / Lincoln Avenue, thereafter four lanes with turning lanes at intersections to Courtland Avenue.
Speed Limit:	30 mph
ADT:	19,700 – 29,000 (average: 21,002)
Infrastructure:	Sidewalks present on US 1 south. Sidewalks present on US 1 north from Broad Street to Grant Street, thereafter intermittent to Maher Road. Crosswalks are stripped at key but not all intersections.
Land Use:	The corridor is composed of neighborhood scaled urban land uses, including multi-family residential and retail, with some buildings fronting the sidewalk as well as auto oriented strip retail.
Landmarks:	East Main Street Railroad Bridge
Crashes:	31 (34.8/mile) Bike: 5 Pedestrian: 26 Detailed listing available in table 15.

Countermeasures

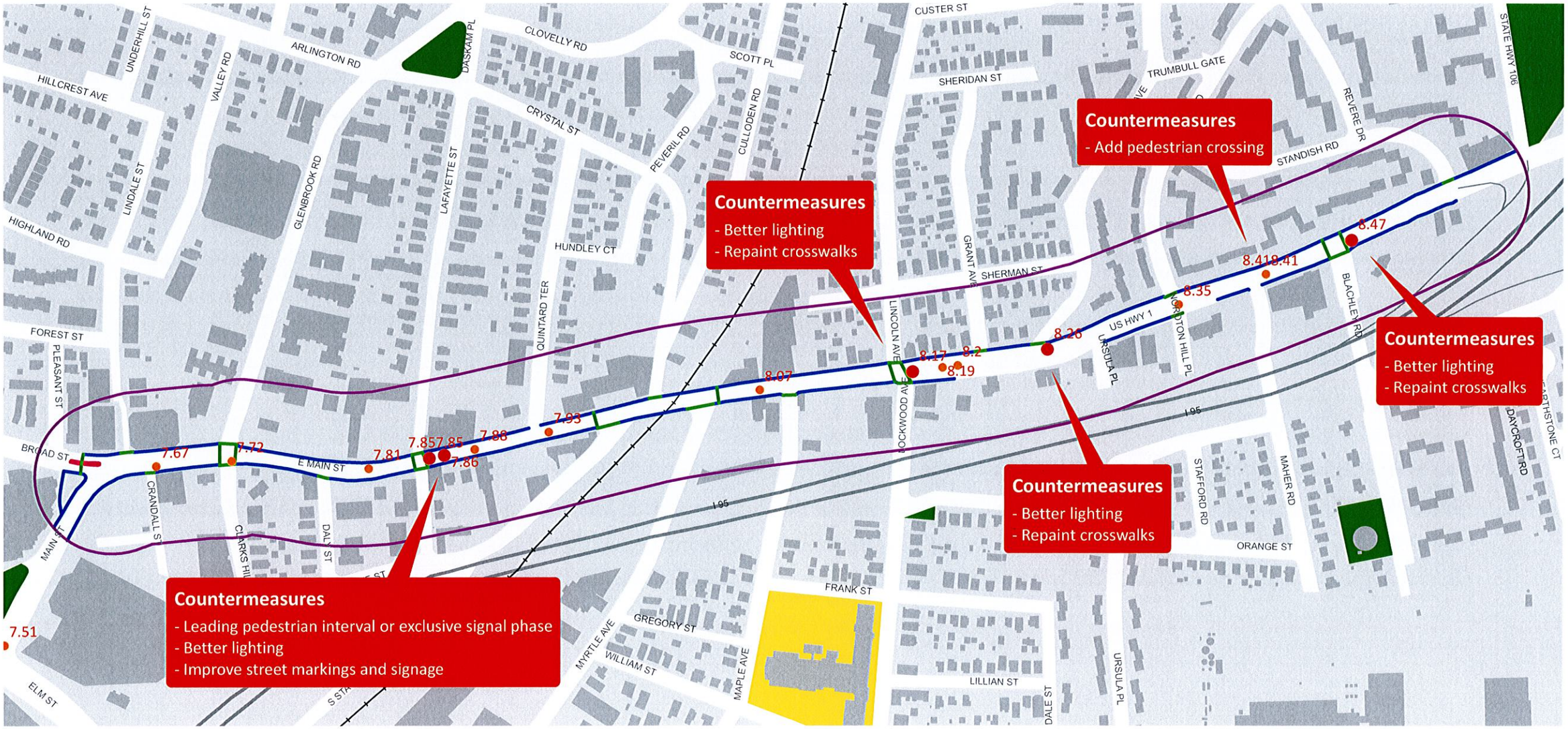
- A total of eleven crashes were recorded at or near the intersection of US 1 (East Main Street) and Lafayette Street (mile posts 7.85 to 7.86). This is the highest bicycle- and pedestrian-involved crash count at any spot location in the South Western Region.
    - Given the narrow cross section of both streets at this intersection, adding a leading pedestrian interval would give pedestrians a head start and make them more visible once in the intersection. Another alternative would be a pedestrian actuated all-red interval, although Stamford does not use this timing pattern and it might have the effect of further congesting vehicle movement at this intersection.
    - About one-third of the crashes here occurred during dark lighted conditions, which may indicate the need for improved lighting at the intersection to make bicyclists and pedestrians move visible to motorists.
    - The cross section of US 1 (East Main Street) narrows from four lanes to two lanes near this intersection, which creates conflicts between bicyclists and motorists who share the road. Adding appropriate signage and in-street markings may help alert bicyclists and motorists to each others' presence as well as make them aware of the rules of the road.
- Three crashes were recorded at the intersection of US 1 (East Main Street) and Lockwood Avenue / Lincoln Avenue (mile post 8.17). All three accidents occurred during dark lighted conditions. This may indicate the need for improved lighting at the intersection to make bicyclists and pedestrians move visible to motorists. Along with lighting, crosswalks should be marked or re-marked with highly visible material.
- Four crashes were recorded at the intersection of US 1 (East Main Street) and Lawn Avenue (mile post 8.17). All three accidents occurred during dark lighted conditions. This may indicate the need for improved lighting at the intersection to make bicyclists and pedestrians move visible to motorists. Along with lighting, crosswalks should be marked or re-marked with highly visible material.
- Although only one crash was recorded at the intersection of US 1 (East Main Street) and Seaton Road, the intersections is in a mixed use zone and is in the middle of a quarter-mile stretch without a striped crosswalk. Adding an unsignalized striped crosswalk here may improve pedestrian visibility to motorists.
- Two crashes were recorded at the intersection of US 1 (East Main Street) and Blachley Road (mile post 8.47). Both crashes occurred during dusk or dark lighted conditions. This may indicate the need for improved lighting at the intersection to make bicyclists and pedestrians move visible to motorists. Along with lighting, crosswalks should be marked or re-marked with highly visible material.

Table 17. Crash Detail – East Main Street Safety Corridor.

Safety Corridor	Route	Mile Post	Case #	Day	Time	Light Condition	Road Surface	Fault Vehicle	Non Fault Vehicle(s)	Contributing Factor	Injury
East Main Street	1	7.67	149902	Monday	14.40	Daylight	Dry	Automobile	Pedestrian	Violated Traffic Control	Possible Injury
East Main Street	1	7.72	121939	Thursday	15.30	Daylight	Dry	Automobile	Pedestrian	Failed to Grant Right of Way	Non-Incapacitating Evident Injury
East Main Street	1	7.81	149984	Friday	21.48	Dark Lighted	Dry	Automobile	Pedalcycle	Failed to Grant Right of Way	Non-Incapacitating Evident Injury
East Main Street	1	7.85	103165	Monday	08.59	Daylight	Wet	Pedestrian	Single Unit Truck (2 Axle, 4 Tire)	Unsafe Use of Highway by Pedestrian	Possible Injury
East Main Street	1	7.85	106773	Tuesday	16.35	Daylight	Dry	Automobile	Pedestrian	Violated Traffic Control	Non-Incapacitating Evident Injury
East Main Street	1	7.85	118201	Friday	17.13	Daylight	Wet	Automobile	Pedestrian	Violated Traffic Control	Incapacitating Injury
East Main Street	1	7.85	123510	Saturday	23.05	Dark Lighted	Dry	Pedestrian	Automobile	Under the Influence	Not Injured
East Main Street	1	7.85	146955	Friday	10.30	Daylight	Dry	Automobile	Pedestrian	Unsafe Right Turn on Red	Not Injured
East Main Street	1	7.85	156047	Monday	17.29	Dark Lighted	Dry	Unknown	Pedestrian	Failed to Grant Right of Way	Non-Incapacitating Evident Injury
East Main Street	1	7.85	137217	Friday	22.11	Dark Lighted	Dry	Pedalcycle	Automobile	Violated Traffic Control	Possible Injury
East Main Street	1	7.85	156959	Thursday	10.06	Daylight	Dry	Pedalcycle	Automobile	Violated Traffic Control	Not Injured
East Main Street	1	7.85	174350	Wednesday	16.19	Daylight	Dry	Pedalcycle	Single Unit Truck (2 Axle, 4 Tire)	Violated Traffic Control	Non-Incapacitating Evident Injury
East Main Street	1	7.86	107141	Monday	09.20	Daylight	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Non-Incapacitating Evident Injury
East Main Street	1	7.86	171996	Friday	16.20	Dark Lighted	Snow/Slush	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Non-Incapacitating Evident Injury
East Main Street	1	7.88	108629	Wednesday	13.00	Daylight	Wet	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Possible Injury
East Main Street	1	7.93	134767	Thursday	10.00	Daylight	Dry	Automobile	Pedestrian	Unsafe Backing	Possible Injury
East Main Street	1	8.07	152593	Sunday	00.15	Dark Lighted	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Non-Incapacitating Evident Injury
East Main Street	1	8.17	100930	Tuesday	18.00	Dark Lighted	Wet	Automobile	Pedestrian	Unknown	Possible Injury
East Main Street	1	8.17	127901	Sunday	20.43	Dark Lighted	Dry	Pedestrian	Automobile	Violated Traffic Control	Incapacitating Injury
East Main Street	1	8.17	131433	Saturday	21.07	Dark Lighted	Dry	Automobile	Pedestrian	Failed to Grant Right of Way	Non-Incapacitating Evident Injury
East Main Street	1	8.19	181308	Saturday	13.10	Daylight	Dry	Pedestrian	Single Unit Truck (2 Axle, 4 Tire)	Unsafe Use of Highway by Pedestrian	Possible Injury
East Main Street	1	8.20	158409	Friday	20.30	Dark Lighted	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Non-Incapacitating Evident Injury
East Main Street	1	8.26	112588	Wednesday	20.12	Unknown	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Possible Injury
East Main Street	1	8.26	163229	Friday	20.29	Dark Lighted	Wet	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Possible Injury
East Main Street	1	8.26	164159	Thursday	15.35	Daylight	Dry	Automobile	Pedestrian	Unsafe Right Turn on Red	Possible Injury
East Main Street	1	8.26	983173	Friday	07.18	Daylight	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Fatal Injury
East Main Street	1	8.35	119906	Saturday	00.25	Dark Lighted	Dry	Automobile	Pedestrian	Failed to Grant Right of Way	Incapacitating Injury
East Main Street	1	8.41	135962	Monday	15.13	Daylight	Dry	Passenger Van	Pedalcycle	Failed to Grant Right of Way	Possible Injury
East Main Street	1	8.41	137211	Friday	01.55	Dark Lighted	Dry	Automobile	Pedestrian	Speed Too Fast for Conditions	Possible Injury
East Main Street	1	8.47	136070	Tuesday	20.09	Dusk	Dry	Automobile	Pedestrian, Pedestrian	Failed to Grant Right of Way	Not Injured
East Main Street	1	8.47	181315	Saturday	18.45	Dark Lighted	Dry	Passenger Van	Pedestrian, Pedestrian	Violated Traffic Control	Incapacitating Injury

East Main Street Safety Corridor - US 1

South Western Region Bicycle and Pedestrian Plan



Safety Corridor
2 - 8
1
Sidewalk
Crosswalk
Median / Traffic Island
Expressway
Highway
Local Street
Metro-North Railroad
Rail Station
Parks & Open Space
Public School
Buildings
Municipal Boundry

0 0.05 0.1 0.2
Miles

Disclaimer: This map is intended for general planning purposes only.

Sources: Connecticut Department of Public Safety, Street Centerlines; Connecticut Department of Environmental Protection, Environmental GIS Data for Connecticut; Traffic Accidents, Traffic Accident Viewing System, Connecticut Departtment of Transportation.

Accident data: January 2005 - June 2008

Prepared on June 8, 2011

SWRPA
South Western Regional Planning Agency

Connecticut Avenue (Norwalk)

Description

Route:	US 1 (Connecticut Avenue)
Length	0.37 miles
Location:	From Shop-Rite plaza to I-95 south entrance/exit
Roadway:	Four lanes with turning lanes at intersections.
Speed Limit:	35 mph
ADT:	25,300
Infrastructure:	Sidewalks present west of Scriber Avenue, intermittent east of Scribner Avenue. Only two crosswalks across US 1 in corridor (both are west of Scriber Avenue), no crosswalks at all at Scriber Avenue intersection and no crosswalks across any side streets.
Land Use:	The corridor is characterized by auto-oriented big box shopping plazas and strip retail.
Landmarks:	Shop-Rite, Stop & Shop, Swanky Franks
Crashes:	7 (18.9/mile) Bike: 3 Pedestrian: 4 Detailed listing available in table 16.

Countermeasures

- Of the seven crashes recorded in the Connecticut Avenue safety corridor, five occurred during dark lighted conditions. This may indicate the need for improved lighting along this stretch of US 1 to make bicyclists and pedestrians move visible. Along with lighting, crosswalks should be marked or re-marked with highly visible material.

- Despite the many businesses in and bus routes serving the corridor, there are few marked crosswalks, even at signalized intersections. In fact, there are only two marked crosswalks within the entire 0.37 mile corridor. At the intersection of US 1 (Connecticut Avenue) and Scribner Avenue, there are no marked crosswalks despite the presence of sidewalks and at some corners, ramps with tactile warning strips.

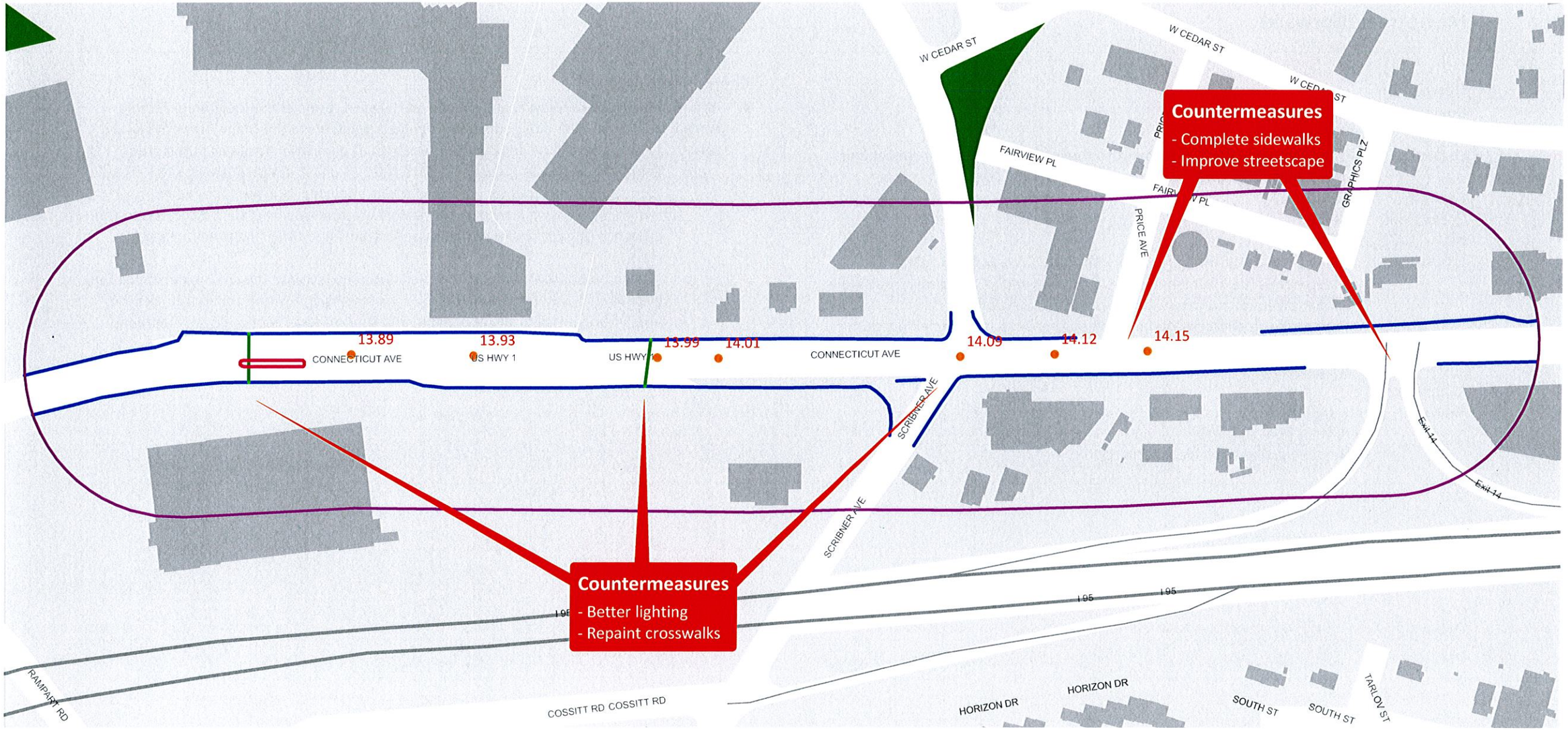
- East of the US 1 (Connecticut Avenue) and Scriber Avenue intersection, sidewalks on both sides of the street are discontinuous. The lack of sidewalks makes this section of US 1 (Connecticut Avenue) unappealing to pedestrians and in some cases may force pedestrians to walk in the roadway for short stretches. Adding sidewalks here would improve the pedestrian environment as well as the aesthetics of the streetscape.

Table 18. Crash Detail – Connecticut Avenue Safety Corridor.

Safety Corridor	Route	Mile Post	Case #	Day	Time	Light Condition	Road Surface	Fault Vehicle	Non Fault Vehicle(s)	Contributing Factor	Injury
Connecticut Ave	1	13.89	114894	Monday	01.19	Dark Lighted	Wet	Unknown	Pedalcycle	Driver Lost Control	Possible Injury
Connecticut Ave	1	13.93	137201	Thursday	22.36	Dark Lighted	Dry	Pedestrian	Automobile	Unsafe Right Turn on Red	Possible Injury
Connecticut Ave	1	13.99	142247	Thursday	20.33	Dark Lighted	Wet	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Incapacitating Injury
Connecticut Ave	1	14.01	136204	Thursday	18.39	Daylight	Dry	Automobile	Pedestrian	Driver's View Obstructed	Non-Incapacitating Evident Injury
Connecticut Ave	1	14.09	172789	Sunday	21.27	Dark Lighted	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Incapacitating Injury
Connecticut Ave	1	14.12	161465	Sunday	13.56	Daylight	Dry	Pedalcycle	Automobile	Failed to Grant Right of Way	Possible Injury
Connecticut Ave	1	14.15	106526	Monday	22.07	Dark Lighted	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Incapacitating Injury

Connecticut Avenue Safety Corridor - US 1

South Western Region Bicycle and Pedestrian Plan



Safety Corridor
2 - 8
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Sidewalk
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Median / Traffic Island
Expressway
Highway
Local Street
Metro-North Railroad
Rail Station
Parks & Open Space
Public School
Buildings
Municipal Boundry

0 200 400 800
Feet

Disclaimer: This map is intended for general planning purposes only.

Sources: Connecticut Department of Public Safety, Street Centerlines; Connecticut Department of Environmental Protection, Environmental GIS Data for Connecticut; Traffic Accidents, Traffic Accident Viewing System, Connecticut Departtment of Transportation; City of Norwalk, Tax Parcels and Building Footprints.

Accident data: January 2005 - June 2008

Prepared on June 8, 2011

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Main Street (Norwalk)

Description

Route:	US 123 (Main Street)
Length	0.55 miles
Location:	From Route 1 in uptown Norwalk to the intersection of Main Street and New Canaan Avenue.
Roadway:	Two lanes.
Speed Limit:	30 mph
ADT:	14,100
Infrastructure:	Sidewalks present throughout the corridor. Crosswalks at major intersections (US 1, Union Avenue, Center Avenue/Catherine Street, New Canaan Avenue), no crosswalks at other intersections
Land Use:	The corridor is characterized by mixed urban land uses, including multi-family residential and retail, with street parking and buildings fronting on the sidewalk as well as auto oriented strip retail.
Landmarks:	
Crashes:	7 (12.7/mile) Bike: 3 Pedestrian: 4 Detailed listing available in table 17.

Countermeasures

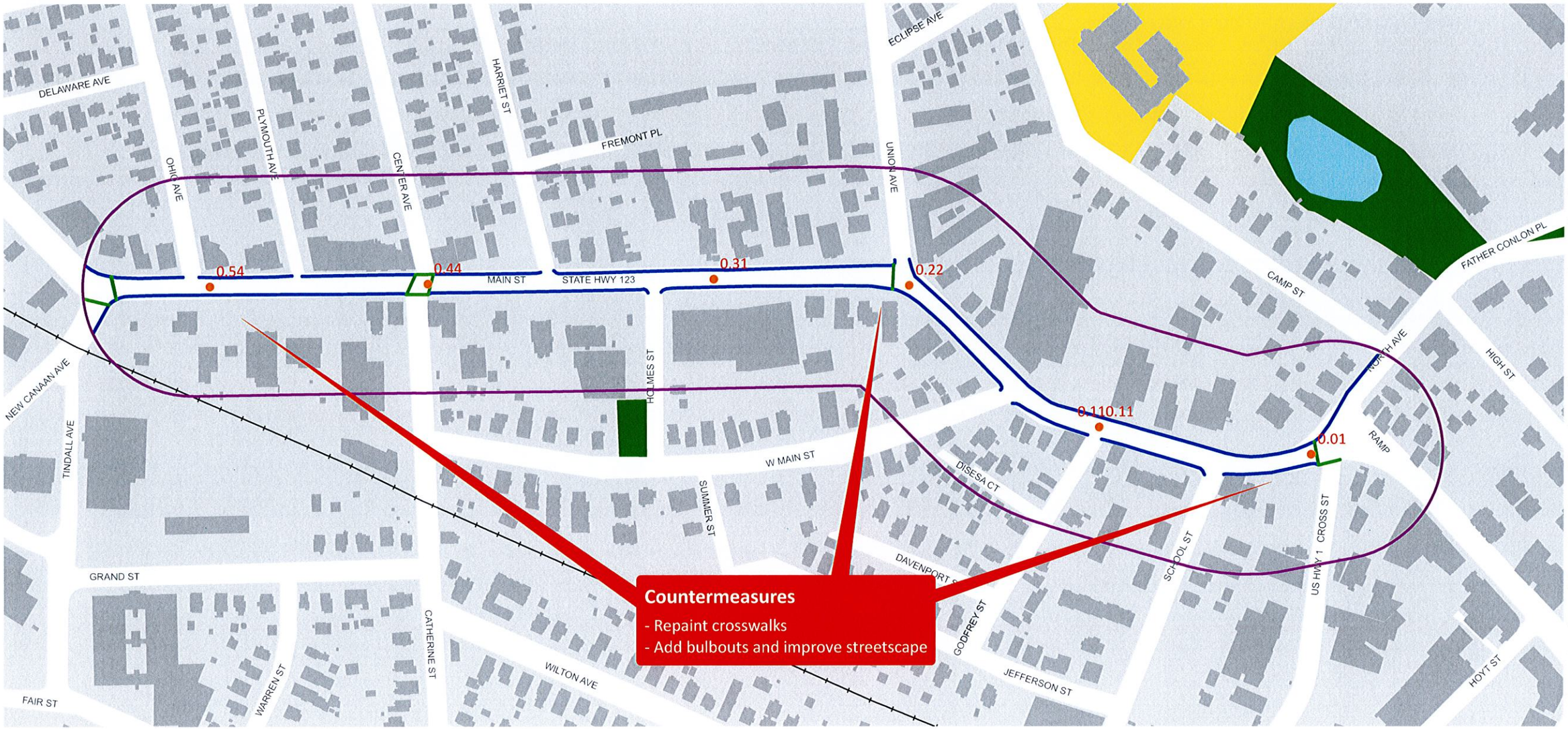
- Although it is hard to identify any specific patterns in terms of the location or factors contributing to bicycle- and pedestrian-involved accidents in the Main Street (Norwalk) safety corridor, there does appear to be a dearth of pedestrian facilities in the area.
    - There are sidewalks present on both sides of the street throughout the half-mile corridor but only four marked crosswalks at eleven intersections. Marking or remarking crosswalks with highly visible material will help alert motorists to the presence of pedestrians and help pedestrians find safer places to cross the street.
    - Adding bulbouts at intersections will not only decrease the crossing distance for pedestrians, but it will help improve the streetscape in the corridor, make the area more aesthetically appealing, and support local economic development.

Table 19. Crash Detail – Main Street Safety Corridor.

Safety Corridor	Route	Mile Post	Case #	Day	Time	Light Condition	Road Surface	Fault Vehicle	Non Fault Vehicle(s)	Contributing Factor	Injury
Main Street	123	0.01	137823	Saturday	14.37	Daylight	Dry	Pedalcycle	Automobile	Failed to Grant Right of Way	Possible Injury
Main Street	**123**	**0.11**	**137817**	**Friday**	**11.44**	**Daylight**	**Dry**	**Pedalcycle**	**Passenger Van**	**Improper Turning Maneuver**	**Non-Incapacitating Evident Injury**
Main Street	123	0.11	146286	Tuesday	10.50	Daylight	Dry	Automobile	Pedestrian	Driver Lost Control	Incapacitating Injury
Main Street	**123**	**0.22**	**121862**	**Tuesday**	**08.14**	**Daylight**	**Dry**	**Pedestrian**	**Automobile**	**Improper Turning Maneuver**	**Possible Injury**
Main Street	123	0.31	138013	Saturday	15.16	Daylight	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Incapacitating Injury
Main Street	**123**	**0.44**	**149704**	**Sunday**	**07.05**	**Daylight**	**Dry**	**Pedalcycle**	**Automobile**	**Violated Traffic Control**	**Non-Incapacitating Evident Injury**
Main Street	123	0.54	101596	Sunday	18.22	Dark Lighted	Dry	Pedestrian	Automobile	Unsafe Use of Highway by Pedestrian	Non-Incapacitating Evident Injury

Main Street Safety Corridor - CT 123

South Western Region Bicycle and Pedestrian Plan



Safety Corridor
2 - 8
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Sidewalk
Crosswalk
Median / Traffic Island

Expressway
Highway
Local Street
Metro-North Railroad
Rail Station

Parks & Open Space
Public School
Buildings
Municipal Boundry

N

0 0.025 0.05 0.1
Miles

Disclaimer: This map is intended for general planning purposes only.

Sources: Connecticut Department of Public Safety, Street Centerlines; Connecticut Department of Environmental Protection, Environmental GIS Data for Connecticut; Traffic Accidents, Traffic Accident Viewing System, Connecticut Departtment of Transportation; City of Norwalk, Tax Parcels and Building Footprints.

Accident data: January 2005 - June 2008

Prepared on May 11, 2010

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Westport

Description

Route:	US 1 (Post Road) and CT 33 (Riverside Ave)
Length	0.55 miles
Location:	From Shop-Rite plaza to I-95 south entrance/exit
Roadway:	Four lanes across the Saugatuck River Bridge, two-to-three lanes through Downtown Westport, 4 lanes east of Bay Street.
Speed Limit:	25 – 30 mph
ADT:	20,049
Infrastructure:	Sidewalks are present throughout corridor, crosswalks also available throughout the corridor including at several unsignalized intersections in Downtown Westport.
Land Use:	The corridor is characterized by town center commercial land uses, including retail and offices, with some street parking and buildings fronting on the sidewalk as well as some auto oriented strip retail towards the east.
Landmarks:	Saugatuck River Bridge, Parker Harding Plaza, Downtown Westport, Westport Country Playhouse
Crashes:	9 (16.4/mile) Bike: 2 Pedestrian: 7 Detailed listing available in table 18.

Countermeasures

- Two crashes were recorded on CT 33 (Riverside Avenue) (mile post 1.60) at its intersection with US 1 (Post Road). Both were attributed to vehicles making turns. Owing to the acute angle of the intersection and presence of buildings constructed out to the lot lines, there are sightline issues that make it difficult to see around corners when cars turn. Adding a leading pedestrian interval would give pedestrians a head start and make them more visible once in the intersection. If feasible, adding a bulb out at the southeast corner of the intersection from the street parking to the crosswalk may help improve the visibility of pedestrians to motorists and vice versa. Marking a crosswalk across US 1 (Post Road) at the western end of the intersection would yeild crosswalks at all four crossings.

- The remainder of the Westport safety corridor includes areas with ample provisions of pedestrian safety features and areas lacking in pedestrian safety features. Near the intersections of US 1 (Post Road) and Parker Harding Plaza, Main Street, and Church Lane, there are signalized intersections with pedestrian-actuated signals and marked crosswalks. Further east, US 1 (Post Road) widens, marked crosswalks are fewer or non-existent, and larger turning radii on intersecting streets (such a Imperial Avenue) encourage vehicles to speed through intersections and increase the crossing distance for pedestrians . Marking crosswalks with high visible material, more urban curb radii, and adding signage and street markings would all contribute to pedestrian safety as well as the streetscape and aesthetics of the area.

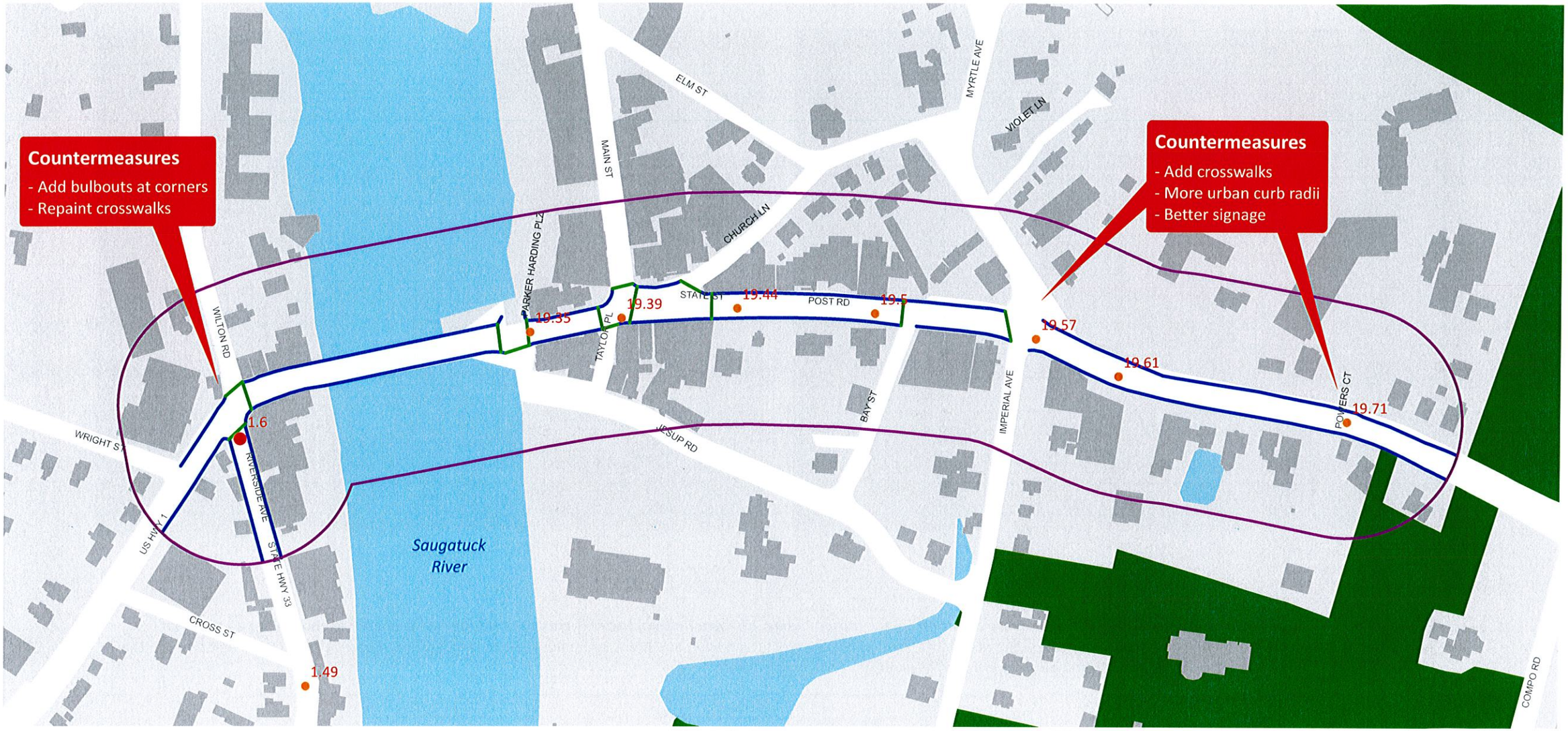
  For the *South Western Region Bicycle and Pedestrian Safety Corridor Study*, a before-and-after visualization was prepared to show what a narrower pedestrian crossing and improved streetscape would look like at the intersection of US 1 (Post Road East) and Main Street adjacent to the Bedford Square (old YMCA) development. The visualizations are reproduced in this report on page 60 (figures 40 and 41).

Table 20. Crash Detail – Westport Safety Corridor.

Safety Corridor	Route	Mile Post	Case #	Day	Time	Light Condition	Road Surface	Fault Vehicle	Non Fault Vehicle(s)	Contributing Factor	Injury
Westport	33	1.60	100958	Friday	18.11	Dark Lighted	Dry	Automobile	Pedestrian	Violated Traffic Control	Non-Incapacitating Evident Injury
Westport	**33**	**1.60**	**148483**	**Thursday**	**09.00**	**Daylight**	**Dry**	**Automobile**	**Pedestrian**	**Failed to Grant Right of Way**	**Possible Injury**
Westport	1	19.35	157751	Thursday	10.44	Daylight	Dry	Automobile	Pedestrian	Failed to Grant Right of Way	Non-Incapacitating Evident Injury
Westport	**1**	**19.39**	**129435**	**Thursday**	**18.19**	**Daylight**	**Dry**	**Pedalcycle**	**Automobile**	**Violated Traffic Control**	**Non-Incapacitating Evident Injury**
Westport	1	19.44	135165	Monday	11.39	Daylight	Dry	Automobile	Pedestrian	Driver Lost Control	Possible Injury
Westport	**1**	**19.50**	**177103**	**Thursday**	**14.52**	**Daylight**	**Dry**	**Automobile**	**Pedestrian**	**Failed to Grant Right of Way**	**Incapacitating Injury**
Westport	1	19.57	158968	Friday	14.34	Daylight	Dry	Pedestrian	Automobile	Following Too Closely	Possible Injury
Westport	**1**	**19.61**	**150210**	**Wednesday**	**16.18**	**Daylight**	**Dry**	**Pedalcycle**	**Automobile**	**Driving on Wrong Side of Road**	**Possible Injury**
Westport	1	19.71	132820	Tuesday	16.35	Daylight	Wet	Automobile	Pedestrian	Failed to Grant Right of Way	Not Injured

Westport Safety Corridor - US 1 (Post Road) / CT 33 (Riverside Avenue)

South Western Region Bicycle and Pedestrian Plan



Safety Corridor
2 - 8
1
Sidewalk
Crosswalk
Median / Traffic Island

Expressway
Highway
Local Street
Metro-North Railroad
Rail Station

Parks & Open Space
Public School
Buildings
Municipal Boundry

N

0 200 400 800
Feet

Disclaimer: This map is intended for general planning purposes only.

Sources: Connecticut Department of Public Safety, Street Centerlines; Connecticut Department of Environmental Protection, Environmental GIS Data for Connecticut; Traffic Accidents, Traffic Accident Viewing System, Connecticut Departtment of Transportation; Town of Westport, Public Rights-of-Way.

Accident data: January 2005 - June 2008

Prepared on June 8, 2011

SWRPA
South Western Regional Planning Agency

Figure 40 and 41[49]**:** For the *South Western Region Bicycle and Pedestrian Safety Corridor Study*, a before (left) and after (right) visualization was prepared to show what a narrower pedestrian crossing and improved streetscape would look like at the intersection of US 1 (Post Road East) and Main Street adjacent to the Bedford Square (old YMCA) development. The view is from US 1 (Post Road East) looking north and east towards the Main Street and Church Lane[50] [51].

4 – Facilities Planning

4-1 Introduction

There are several long-standing plans for multi-use trails through Connecticut's South Western Region. Currently, these trails exist in various stages of development, from plans to construction to completion. As can be observed elsewhere in Connecticut and across the nation, multi-use trails provide an alternative travel option, are considered a significant amenity by local resident, and can help shape a region. These trails, along with a complimentary network of on-road facilities, constitute the vital elements of the future bicycle and pedestrian system.

This report provides an overview of the major trails planned in the South Western Region:

- The **Greenwich I-95 Trail** would serve east-west movements through the southern portion of the town, where the only option now is busy US 1 (Putnam Avenue).
- Forming an east-west axis across the region, the **Merritt Parkway Trail** is the largest and most ambitious trail proposal. The portion of the trail in this region is part of a still larger proposal for a multi-use trail along the entire length of Merritt Parkway, which is a vital and missing link on the East Coast Greenway between Maine and Florida.
- In Stamford, the **Mill River Greenway** will improve bicycle and pedestrian movement through the downtown and surrounding neighborhoods while also providing a significant recreational and aesthetic amenity. The park through which this trail passes is currently under construction.
- The **Norwalk River Valley Trail** would form a north-south axis along its namesake Norwalk River from Norwalk to Wilton and further north. This trail would parallel US 7, connecting numerous neighborhood centers, office parks and rail stations. Portions of the trail are open in Norwalk.

This section lays out a detailed summary of each trail proposal, including the proposed alignment, existing land ownership, physical and property constraints, and completion status. In addition, sketch planning estimates of the total cost to design and construct the trail are presented. The sketch planning cost estimates are based on a synthesis of recently completed trail projects in Connecticut supplemented with data from across the nation.

The four major trails presented in this chapter represent the best opportunities to site off-road trails in the Region. Unlike many other areas of the State and Nation, all the railroad rights-of-way in the area remain in active use. Though some shoreline parks exist, most of the shoreline is privately held and there exists little possibility of substantial redevelopment or dedication of easement for public access.

All together, the major trails included in this plan would extend over sixty-two miles if fully realized. Of that total, the Merritt Parkway and Norwalk River Valley Trails make up about seventy percent. About eighty percent of this total, or just less fifty miles, is planned as off-road facilities. The remainder would take the form of on-road facilities, including sidewalks and bicycle lanes, where feasible. Currently, about seven miles of the envisioned trail system, or eleven percent, are complete. That means the vast majority is still to be realized.

Table 21. Status summary of the South Western Region's major multi-use trails.

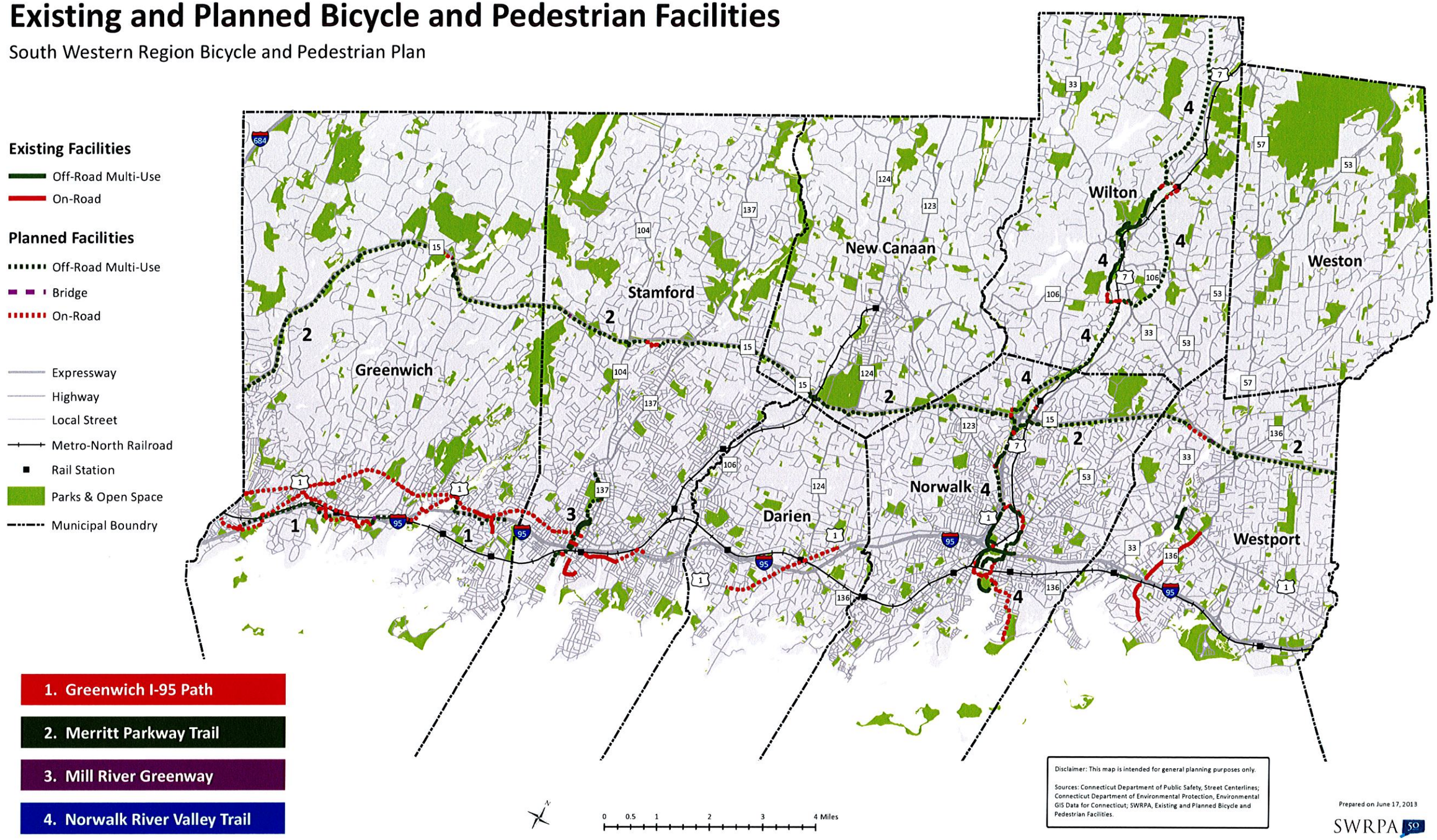
Trail	Length (mi)	Complete (%)	In design (%)	Planned (%)
Greenwich I-95 Path	10.0	0.0	0.0	100.0
Merritt Parkway Trail	24.8	0.0	3.5	96.5
Mill River Greenway	3.7	31.4	0.0	57.3
Norwalk River Valley Trail	19.6	20.8	13.2	66.0

Perhaps at no time has there been so much attention devoted to making progress on these trails. The Mill River Greenway is under construction as part of a larger effort to build a major new downtown park in Stamford and restore the Mill (Rippowam) River. There is now an active and organized group working to advance the Norwalk River Valley Trail. The group was recently awarded a Recreational Trails Grant by the CTDEP, which will support a routing study. Connecticut DOT was recently rewarded a $1 million grant to develop a plan for the Merritt Parkway Trail.

The map on the next page presents the four major trails within the regional context.

Existing and Planned Bicycle and Pedestrian Facilities

South Western Region Bicycle and Pedestrian Plan



4-2 Multi-Use Trail Descriptions

Analysis Method
In order to understand existing conditions and environmental constraints along the proposed alignment of each multi-use trail, numerous data sources were researched and analyzed. The findings presented in this section represent a sketch-planning view, which should be suitable for understanding the macro issues associated with each multi-use trail. Data considered as part of this analysis is described below:

Trail Alignment
This information was derived from existing trail plans as well as from input provided by trail advocates.

Trail alignment features were coded based on the current status of the trail segment (complete, under construction, in design, planned) and the surface treatment type (shared roadway, off-road paved, off-road crushed stone, compact earth, bridge/structure).

Land Ownership
This information was obtained from municipal land records, which were available in GIS shapefile format.

Land ownership along trail corridors was determined by selecting parcels that intersect with the proposed trail alignment. It should be noted that the vast majority of property where these trails would be located is publically owned, mostly by CTDOT.

Environmental Data
This information was obtained from the Connecticut Department of Environmental Protection's GIS dataset and includes data such as the location of water courses and water bodies, wetland soils, and natural diversity / endangered species areas.

The analysis of environmental constraints was mostly concerned with the presence of water courses and water bodies, which may necessitate alternate routings or costly crossings. Locations where a bridge may be necessary to carry a trail over water are identified on the maps and the costs to do so are included in the estimates. Other environmental constraints, such as slopes and soil, are important considerations in trail planning but are less relevant at the macro scale of this plan.

Transportation Data
This information was obtained from various state and municipal agencies. It includes data such as the location and use of expressways, streets, traffic signals, railroads, and rail stations.

Transportation data was considered as it related appropriate routes for on-road routing, street crossings, and existing bicycle and pedestrian infrastructure as well as intermodal connections to rail and bus services.

Trail Cost Estimates

Simple cost estimates based on recently completed trail projects were obtained from the Connecticut Department of Transportation and various municipalities and supplemented with data from across the nation.

For each multi-use trail, simple cost estimates are presented. These are rough estimates meant to give an idea of the magnitude of the costs to construct each trail. Estimated construction costs are based on unit costs obtained from CTDOT, Vermont Agency of Transportation, and several South Western Region municipalities, which were adjusted based on stakeholder input. All costs presented here are current year (2010) dollars. Property acquisition costs were not considered in the estimates as the vast majority of the trail alignments traverse public land, mostly CTDOT property.

The costs considered as part of the estimate include:

- Surface treatment (expressed here as *On-Road* and *Off-Road*) as well as any bridges or structures;
- Intersection improvements; and
- Soft costs, including engineering, inspection and contingency

Unit costs used for estimation are presented on the following page.

Figure 43: The paved Shining Sea Path on Cape Cod[52]. (top)
Figure 44: The stone dust Housatonic Trail in Trumbull[53]. (bottom)

Table 22. Multi-Use Trail Unit Cost Estimates

Item	Cost ($)	Unit	Notes
Surface Treatment			
Off-Road, Paved	250	linear foot	10' wide bituminous trail, 2' grass shoulder, uncleared land
Off-Road, Stone Dust	200	linear foot	10' wide stone dust trail, 2' grass shoulder, uncleared land
Off-Road, Compact Earth	15	linear foot	Hiking trail, uncleared land
On-Road, Marked	4	linear foot	Bike lane stripe, pavement marking, durable
Sidewalk	15	linear foot	Concrete
Bridge	3,500	linear foot	Pre-fabricated, includes abutments
Intersection Improvements			
Paint Crosswalk	4,000	intersection	MUTCD compliant, labor
New Signal	125,000	intersection	
Retime Signal	6,000	intersection	Add pedestrian phase only, no new signals, labor
Signage - Minor Intersection	3,600	location	4 MUTCD compliant signs, labor
Signage - Major Intersection	6,600	location	8 MUTCD compliant signs, labor
Soft Costs			
Engineering + Permitting	55%	construction	Includes engineering design, permitting, local project management and construction inspection
Contingency	10%	construction	

Figure 45: Pre-fabricated bridge over a Norwalk Harbor inlet[54]. (top)
Figure 46: Marked pedestrian crosswalk and a flexible, in-road yield-to-pedestrian sign[55]. (bottom)

Greenwich I-95 Path

Description

The Greenwich I-95 Path is a planned, combination multi-use trail and on-road route that would traverse the populated and traffic congested neighborhoods of southern Greenwich. The trail would generally follow the route of I-95 and US 1 (Putnam Avenue) from the New York state line through downtown Greenwich to the Stamford town line. While pedestrians can mostly navigate sidewalks along US 1 and connecting streets, the high traffic volumes, numerous curb cuts, and narrow lanes make cycling a difficult proposition, especially for novice cyclists. Unfortunately, pedestrians and especially cyclists making their way across town have few alternatives but to use US 1 (Putnam Avenue). Therefore, the purpose of the path would be to provide an off-road route for pedestrians and cyclists. The route alignment presented in this plan is drawn from and nearly identical to the one shown in the Town of Greenwich *Bicycle Master Plan*. The route alignment presented here is also quite similar to the on-road routing the East Coast Greenwich, with some exceptions.

Route

As its name would suggest, this trail would parallel I-95 (and US 1) through southern Greenwich, using publicly owned land wherever possible. The trail would be off-road wherever the use of publically-held land (town parks, I-95 right-of-way) permits. However, because the area is well developed and publically held land is limited, most of the trail would follow on-road alignments.

From the New York state border, the Greenwich I-95 Path would follow Mill Street and Devavan Avenue through Byram. At I-95 Exit 2, one alternative would continue the I-95 Path as an on-road alignment via Ritch Avenue, Hamilton Avenue, and Railroad Avenue into downtown Greenwich. An alternative would route the I-95 Path through the thin strip of land between Metro-North Railroad and the I-95 right-of-way. A few different alternatives would bring the I-95 Path, likely as an on-route route, through downtown Greenwich. From Bruce Park, the trail would follow a new bridge over I-95 and then a short segment of off-road trail to Indian Field Road. From Indian Field Road to the Mianus River, the alignment would be on-road. Once across the bridge, the I-95 path could again become an off-road trail by using the I-95 right-of-way, including land around I-95 Exit 5. The trail would end somewhere in the vicinity of Rosa Hartman Park near the Stamford town line.

Summary Statistics

Length

10.0 miles

Alignment

Off-Road:	3.8 miles (38%)
On-Road:	6.2 miles (62%)

Status

Complete:	0%
Design:	0%
Planned:	100%

Estimated Construction Cost

Trail	
Off-Road:	$5.9 million
On-Road:	$0.1 million
Intersections:	$0.4 million
Engineering:	$3.6 million
Contingency:	$0.6 million
Total:	$10.7 million

Planning Context

Land Ownership

- Public:
  - I-95 right-of-way
  - State and town maintained streets
  - Bruce Park

Intermodal Connections

- Metro-North
  - Greenwich
  - Cos Cob
- CT Transit bus route 11

Major Constraints

- Use of the I-95 right-of-way: Proposed trail alignment calls for use of I-95 right-of-way for some sections. Fortunately, there is precedent for this in Connecticut. In East Hartford and Manchester, the Charter Oak Greenway, part of the East Coast Greenway, fits snugly within the I-84 and I-384 rights-of-way.
- Mianus River crossing: The Town of Greenwich *Bicycle Master Plan* proposes to carry the Greenwich I-95 Path over the Mianus River via a new bridge. This structure would be located just south of the existing US 1 (Putnam Avenue) bridge. The bridge would be especially useful to cyclists heading south / west, who could avoid left turns onto and off of US 1. In the long term, were the I-95 bridge over the Mianus River ever to be rebuilt, a pedestrian and bicycle path could be added.
- New bridge over I-95: The Town of Greenwich *Bicycle Master Plan* proposes to carry the Greenwich I-95 Path over I-95 and Metro-North Railroad via a new bridge. This structure would be located just south / west of Exit 4. Such a structure would undoubtedly be quite expensive so an on-road routing might me more realistic.
- Additional constraints are identified and described on the detailed Greenwich I-95 Path map.

Implementation

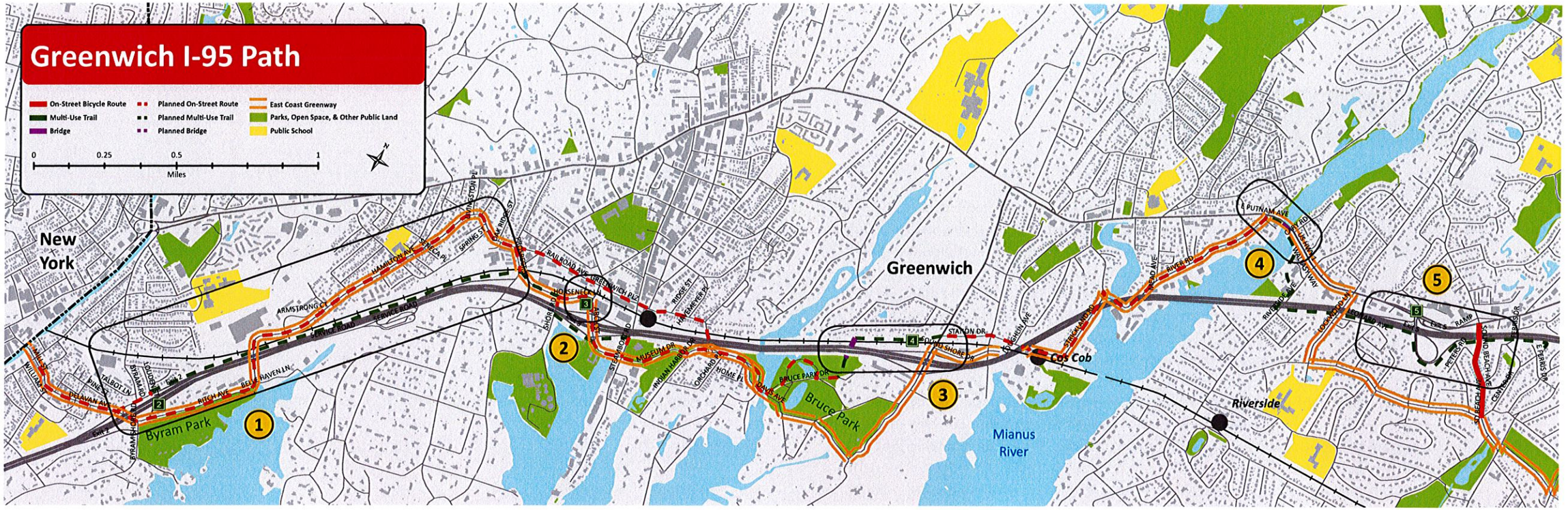
Next Steps

Roughly two-thirds of the Greenwich I-95 Path is planned as an on-road route. This means that many sections of the trail could be realized with little capital investment or as part of the Town's regular maintenance program.

- Add signage to on-street portion of route.
- Add bicycle lanes or shared right-of-way markings to streets as they are repaved, when appropriate.
- Add accessible curb ramps, where necessary.
- Follow recommendations in *Town of Greenwich Bicycle Master Plan.*

Long Term

- Continue to add bicycle lanes or shared right-of-way markings to streets as they are repaved.
- Ensure that all sidewalks and crosswalks along the extent of the Greenwich I-95 Path are accessible.
- Work with Connecticut DOT to gain access to and construct multi-use trail sections within the I-95 right-of-way.



(1) Right-of-Way

Between Byram and downtown Greenwich, the I-95 Path could make use of a right-of-way between I-95 and Metro-North Railroad. Safety will need to be addressed, both in terms of fencing to prevent errant trail users from trespassing onto the expressway and railroad as well as access for emergency vehicles. An access from Stone Avenue over the railroad would like the trail to Chickhominy. As an alternative, an on-street route might be provided on Ritch Avenue and Hamilton Avenue.

(2) Exit 3 - Arch Street

The area around I-95 Exit 3 is often congested with commuter traffic to the and from downtown Greenwich. One alignment would take the I-95 path as a sidepath on Horseneck Lane and Shore Road beneath I-95 before becoming a multi-use trail along a short stretch of unimproved waterfront land adjacent to an Exit 3 off-ramp. After crossing Arch Street, Bruce Park can be reached by following the Exit 3 on-ramp or by following Arch Street to Museum Drive. Alternate on-street route have significant constraints. A route on Railroad Avenue might need to use the narrow Field Point Road underpass of Metro-North Railroad while a route along Arch Street would be subject to heavy rush hour congestion and vehicle turning movements.

(3) Crossing I-95

The Town of Greenwich Bicycle Master Plan calls for a bridge from Bruce Park over I-95 and Metro-North Railroad to the state owned right-of-way on the southbound side of I-95. A less costly alternative might be to continue following the northbound I-95 right-of-way across Indian Field Road to Sound Shore Drive.

(4) Mianus River

If the I-95 bridge over the Mianus River were ever to be rebuilt, a multi-use path could be added along the northbound side similar to other expressway bridges in Connecticut. An on-street route could follow River Road, US 1 (Putnam Avenue) over Mianus River, and Riverside Avenue / Lockwood Lane.

(5) Riverside & Exit 5

The Town of Greenwich Bicycle Master Plan proposed a multi-use trail in the I-95 right-of-way south of exit 5. A trail here would keep users from having to navigate thru one of the busiest and most accident prone sections of US 1 (Putnam Avenue) in Greenwich. At Sound Beach Avenue, the I-95 Path would connect with a short section of on-street bicycle lanes.

Merritt Parkway Trail

Description

The Merritt Parkway Trail is a major, planned multi-use trail that would traverse the South Western Region. The trail would be located within the right-of-way of the historic Merritt Parkway (CT 15). The full extent of the trail would extend north of the region along the Merritt Parkway to the Housatonic River and potentially to the south as well along the Hutchinson River Parkway. It is envisioned that the Merritt Parkway Trail could, when realized, become the designated route of the East Coast Greenway through the region. At present, the portion of the East Coast Greenway through southwestern Connecticut is the longest stretch of the Maine-to-Florida trail without a viable off-road routing.

The state-owned right-of-way through which the Merritt Parkway passes is approximately 300 feet wide. The expressway facility fits within about the northern one-third of the right-of-way, leaving the southern portion available for the trail. While the available land is a great advantage, the landscape and expressway structures create challenges. The right-of-way contains rock outcroppings, waterways, and steep grades, which make the prospects of developing a trail comparatively more difficult than in an abandoned railroad right-of-way, where level grades and a good roadbed are already present. Further, the historic bridges and expressway interchanges present traffic and safety issues for both motorists and trail users. Preserving the historic structures and landscape of the Merritt Parkway presents further challenges but also opportunities. While a multi-use trail would alter the Merritt Parkway, it would also create new opportunities to appreciate its historic character other than from the windshield of a speeding car.

Route

The Merritt Parkway Trail would closely parallel its eponym within the southern portion of the CTDOT-owned right-of-way. The trail would begin in Greenwich and pass through Stamford, New Canaan, Norwalk, and Westport before exiting the region on its way its way north. In a few short sections, the trail may utilize local streets adjacent to the trail, where doing so avoids the need to build a new, costly river crossing.

The routing presented here assumes that the trail will cross all interchanges and bridges at grade with the side street. However, each interchange and bridge is unique and therefore, traffic operations and safety as well as historic preservation and landscape considerations at these locations deserve more in depth study.

Summary Statistics

Length

24.8 miles

Alignment

Off-Road:	23.8 miles (96%)
On-Road:	1.0 miles (4%)

Status

Complete:	0.0%
Design:	3.5%
Planned:	96.5%

Estimated Construction Cost

Trail	
Off-Road:	$27.8 million
On-Road:	$ 0.1 million
Intersections:	$ 0.5 million
Engineering:	$15.6 million
Contingency:	$ 2.9 million
Total:	$46.7 million

Planning Context

Land Ownership

- Public:
  - Merritt Parkway (CT 15) right-of-way
  - State and town maintained streets

Intermodal Connections

- Metro-North
  - Merritt 7
  - Talmadge Hill
- CT Transit
  - Routes 31, 32
- Norwalk Transit District
  - Routes 2, 3, 4, 7-Link

Major Constraints

- Use of Merritt Parkway right-of-way: Proposed trail alignment would use the southern portion of the Merritt Parkway right-of-way. Despite persistent attempts by trail advocates, CTDOT has yet to grant permission for a trail in the right-of-way. Fortunately, there is precedent for a multi-use trail adjacent to an expressway. In East Hartford and Manchester, the Charter Oak Greenway, part of the East Coast Greenway, fits snugly within the I-84 and I-384 rights-of-way. In Hamden and Wallingford, there are short sections of multi-use trail adjacent to the Wilbur Cross Parkway. In New York State, the South County Trailway closely follows the Saw Mill River Parkway.
- Historic preservation and landscaping considerations: The Merritt Parkway has been recognized as a National Scenic Byway and is listed on the National Register of Historic Places. Any alterations to the historic structures and landscape must appropriately fit the unique character of the Merritt Parkway.
- Street crossings at interchanges: The trail would pass through fourteen Merritt Parkway interchanges in the Region. These interchanges and their intersections with local streets pose a variety of challenges. Some interchanges, such as Exit 36 or Exit 37, may only require relatively minor modifications, such as signal timing changes to accommodate trail users. Other interchanges, such as Exit 29 or Exit 33 will require more significant engineering improvements.
- Water crossings: As the trail traverses the entire South Western Region, it would cross many rivers and streams, including the Mianus, Mill (Rippowam), Five Mile, Silvermine, Norwalk, and Saugatuck Rivers. In all instances, either a new structure would be required or the trail would have to make use of a nearby local street where a bridge already exists.
- Additional constraints are identified and described on the detailed Merritt Parkway Trail maps.

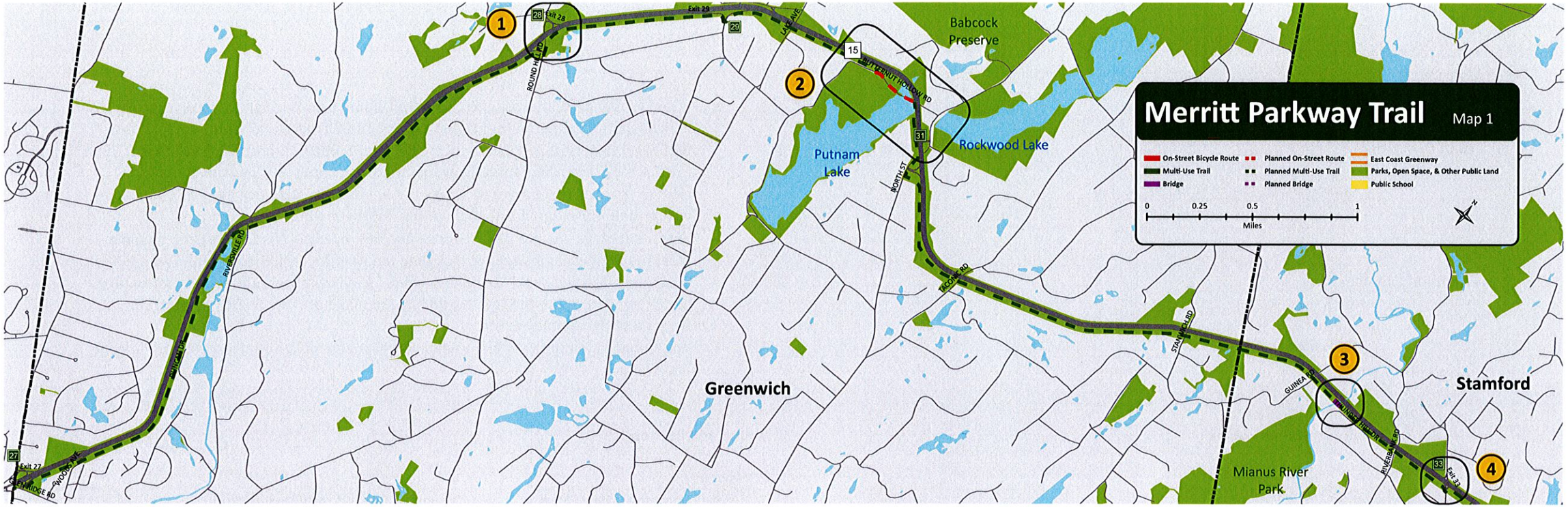
Implementation

Next Steps

- Complete USDOT Scenic Byways program-funded trail routing study
- Obtain CTDOT permission to use the Merritt Parkway right-of-way for a multi-use trail.
- Construct demonstration trail segment in Stamford between High Ridge Road and Newfield Avenue.
- Include trail as part of design and reconstruction of CT 15-US 7 interchange in conjunction with Norwalk River Valley Trail.

Long Term

- Connect demonstration trail segment and US 7 – CT 15 interchange trail segment via Waveny Park and Talmadge Hill rail station
- Construct full length of trail, linking Merritt Parkway trail to already completed sections of the East Coast Greenway in Connecticut and New York.



(1) Exit 29

Non-traditional Merritt Parkway interchanges may create safety conflicts for the trail. Exit 29 northbound (Old Mill Road) differs from traditional diamond interchanges as there is no traffic control (stop sign or signal) at the on- and off-ramp termini. This creates a concern, as vehicles following the free flow traffic pattern may exit the Merritt Parkway at high speeds. In order to provide a safe crossing with adequate sightlines for both motorists and trail users, a highly visible street crossing at some distance south of the interchange would be necessary. Signage and barriers may also be necessary to prevent trail users from making an unsafe crossing. Another option would be to modify the on- and off-ramp termini or add traffic control in order to reduce vehicle speeds

(2) Putnam Lake

To cross Putnam Lake, the trail could take advantage of an old roadbed that was formerly part of Butternut Hollow Road. Using this roadbed would be permit an easier and more scenic way across Putnam Lake. Routing the trail on lightly traveled Butternut Hollow Road for a short stretch rather than developing a new parallel would also reduce costs.

(3) Mianus River

A new bridge will be needed to bring the trail across the Mianus River in Stamford. If a suitable easement were to be obtained, a connection to the Mianus River Park and its network of trails would be possible.

(4) Exit 33

Non-traditional Merritt Parkway interchanges may create safety conflicts for the trail. Exit 33 (Den Road) differs from traditional diamond interchanges as there is no traffic control (stop sign or signal) at the on- and off-ramp termini. This creates a concern, as vehicles following the free flow traffic pattern may exit the Merritt Parkway at high speeds. In order to create a safe crossing with adequate sightlines for both motorists and trail users, a highly visible street crossing at some distance south of the interchange will be necessary. Signage and barriers may also be necessary to prevent trail users from making an unsafe crossing. Another option would be to modify the on- and off-ramp termini or add traffic control in order to reduce vehicle speeds.

(1) Exit 34 & 35

The trail must cross two busy Merritt Parkway interchanges at Exit 34 (CT 104 / Long Ridge Road) and Exit 35 (CT 137 / High Ridge Road.) At each interchange, care must be given to ensure trail users moving through the intersections are clearly visible to motorists and vice versa. Where possible, Merritt Parkway entrance and exit ramp termini should be modified to encourage slow speed turns by motorists and shorten crossing distance for trail users. Free-flow vehicle movement should be avoided while taking into consideration the operational needs of the highways in the area. Signage should clearly direct trail user to the safe crossing and discourage unsafe crossings.

(2) Mill (Rippowam) River

Between Long Ridge Road and High Ridge Road, the trail must cross the Mill (Rippowam) River. Rather than building a new bridge, utilizing the bridge on Cedar Heights Road over the river would be less costly. Routing the trail on local streets (Wire Mill Road, Cedar Heights Road, Rapids Road) between Long Ridge Road and a CL&P facility may be viable in this section. With permission, the trail would traverse the CL&P facility and provide public access at a scenic point along the Mill (Rippowam) River.

(3) Demonstration Section

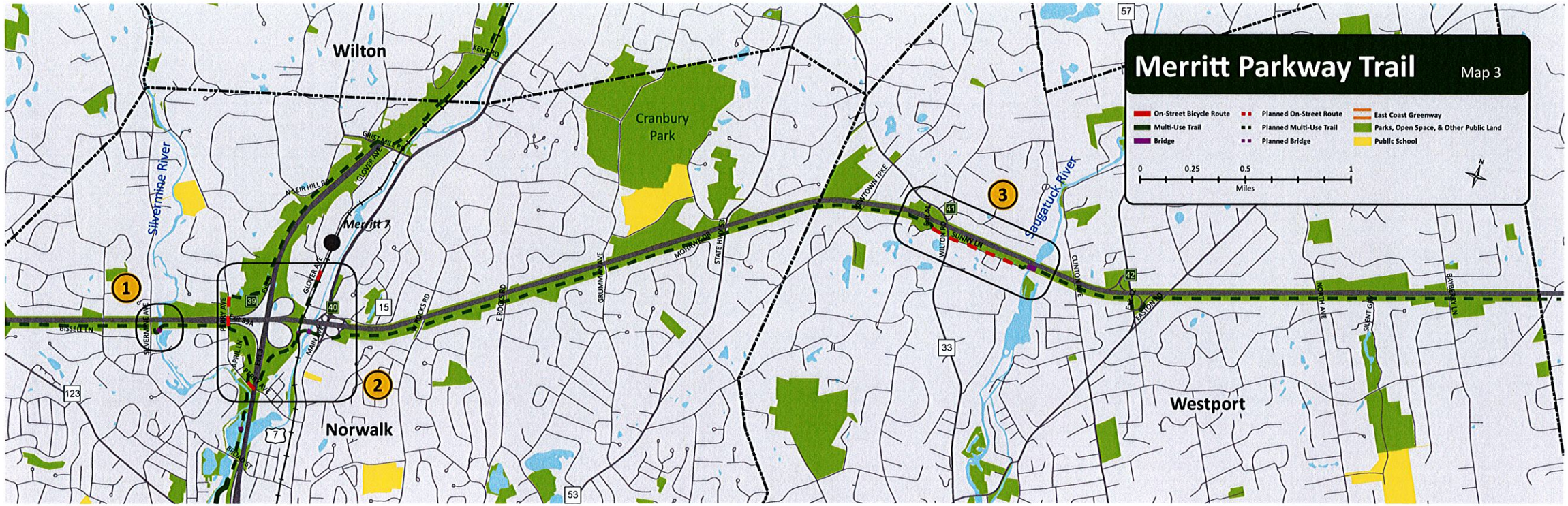
Between High Ridge Road and Newfield Avenue is the section that was promoted as a demonstration project in 2001. The approximately three-quarter mile segment offered access at either end via a State park-and-ride facility and the Italian Center of Stamford (which at the time, offered permission to use its facility.) The purpose of the project was to demonstrate the feasibility of the trail concept and provide an example for other communities to emulate. A detailed plan was developed for this section.

(4) Talmadge Hill and Waveny Park

Near Exit 36, the trail could be routed on Talmadge Hill Road to provide access to Talmadge Hill rail station. Hourly rail service and free weekend parking are available at the station. Suitable bicycle and pedestrian facilities are needed on CT 106 and Talmadge Hill Road to safely guide trail users through the intersection and around the rail station. East of the station, the trail could resume an exclusive alignment in the Merritt Parkway right-of-way. A connection to Waveny Park, the largest park in New Canaan, would be possible via an on-street route on Lapham Road. The trail would likely cross Lapham Road at grade.

(5) Five Mile River

It may be possible to route the trail on the existing Merritt Parkway bridge over the File Mile River. There is a space approximately twenty-to-twenty-five feet wide from the edgeline of the expressway to the edge of the structure. In fact, the space is large enough that large trees appear to have grown in it. Using the existing structure may have a lower price tag than building a new structure to carry the trail across the river.



Silvermine River Crossing

A bridge will be necessary to carry the trail across the Silvermine River in Norwalk. An alternative would be to provide a bicycle and pedestrian crossing on a new Merritt Parkway bridge over the Silvermine River, which is currently being considered by CTDOT. A safe crossing is also needed where the trail would intersect Silvermine Avenue.

US 7 - CT 15 Interchange

East of Silvermine Avenue, the trail must pass through an area dominated by the US 7 – CT 15 interchange. This area deserves a great deal of attention because of the planned improvements to the interchange, its potential as a junction with the Norwalk River Valley Trail, and the presence of the Merritt-7 office park. Although plans to improve the interchange are stalled at present, the last viable design concept (alternate #21c) showed a route around the interchange for the Merritt Parkway Trail and the Norwalk River Valley Trail, including a section shared by both trails. The Merritt Parkway Trail would use an exclusive right-of-way around the southern half of the interchange. A new bridge would carry the trail over the Danbury Branch railroad and Norwalk River while a short spur would provide access to the Merritt-7 office park and rail station. At Main Avenue, the trail would make use of a revised exit 40 ramp alignment and intersection, which is planned as part of the interchange project.

Exit 41 and Saugatuck River Crossing

Exit 41 and Saugatuck River crossing
Just east of exit 41 in Westport, routing a short section of the trail on Spring Hill Road would make for a safe, convenient approach to the CT 33 (Wilton Road) intersection and Sunny Lane. An on-street route on Sunny Lane, with appropriate safety treatments at the Merritt Parkway ramps, makes the most sense. Parking would available to trail users at the State park-and-ride facility. Further east, a new bridge will be necessary to bring the trail across the Saugatuck River. In combination with the YMCA property, a new public access point to the Saugatuck could be created here.

Mill River Greenway

Description

The Mill River Greenway would follow the course of the Mill River through downtown Stamford. The trail is one element of a major initiative to create a new, marquee green space in downtown Stamford and restore the Mill River, which is being led by a public-private partnership. The Mill River Greenway will link the new park with existing parks and open spaces located along the Mill River, including Scalzi Park. As a public-private partnership, some sections of the greenway, such as the piece behind the RBS Building or adjacent to the Gateway development in the South End, are being realized in concert with redevelopment of adjacent properties. A large section of the park between Mill River Street, Broad Street, and Washington Boulevard opened to visitors in 2013. When fully realized, the Mill River Greenway will provide an alternative to Washington Boulevard between the Stamford Transportation Center, downtown Stamford, and the Ridgeway neighborhood for bicyclists and pedestrians.

Route

As its name would suggest, the greenway will parallel the Mill River from Selleck Street north until about Forest Lawn Avenue. Most of this land is publically-owned park land but some property is privately held. From the south, the greenway would follow Selleck Street and Greenwich Avenue to Pulaski Street as a side path adjacent to city streets. From Pulaski Street north, the trail would follow the river's edge as a multi-use path. From McCullough Street / South State Street, there may be trails on both the east and west sides of the river. From about Richmond Hill Avenue north, property on the west side of the Mill River is publically owned while property on the east side of the river is both publically and privately owned. Easements over private property or redevelopment would be needed to carry the greenway through this section. Between Main Street and Broad Street, the trail passes through the heart of the recently opened Mill River Park. From Broad Street north, a strip of publically owned land would carry the trail north along the west side of the river's edge all the way to Scalzi Park. An existing pedestrian bridge over the Mill River near Woodside Street would link the proposed trail with an existing sidewalk along the east side of the river. The existing sidewalk continues up to Vincent Horan Park.

Summary Statistics

Length

3.75 miles (1.17 miles completed)

Alignment

Off-Road: 3.75 miles (100%)

Status

Complete:	31.4%
Design:	11.3%
Planned:	57.3%

*Estimated Construction Cost**

Trail	
Off-Road:	$4.2 million
On-Road:	$0.0 million
Intersections:	$0.1 million
Engineering:	$2.4 million
Contingency:	$0.4 million
Total:	$7.2 million

*SWRPA estimate of trail cost only. Figure does not include any other elements that are part of the Mill River Greenway master plan.

Planning Context

Land Ownership

- Public:
  - Mill River Greenway
  - Scalzi Park
  - Vincent Horan Park
  - State and town maintained streets
- Private:
  - Numerous private properties south of Tresser Boulevard on the east side of the river and Richmond Hill Avenue on the west side of the river.

Intermodal Connections

- CT Transit
  - Routes 11, 13, 14, 21, 22, 24

Major Constraints

- Private property: In order to realize the full extent of the Mill River Greenway, it will be necessary to obtain easements over or the acquisition of private property. Redevelopment of properties in the corridor may aid in this effort. For instance, a section of trail along the Mill River was recently built as part of the new RBS building.
- Crossing beneath I-95 and Metro-North Railroad: The I-95 and Metro-North Railroad bridges over the Mill River hinder the extension of the greenway towards the south. The clearance beneath Metro-North Railroad at Greenwich Street and the Mill River is especially narrow and constrained. The planned reconstruction of the Metro-North Railroad bridge over Greenwich Avenue is likely the best opportunity to clear an adequate space through which the trail could pass.
- Additional constraints are identified and described on the detailed Mill River Greenway map.

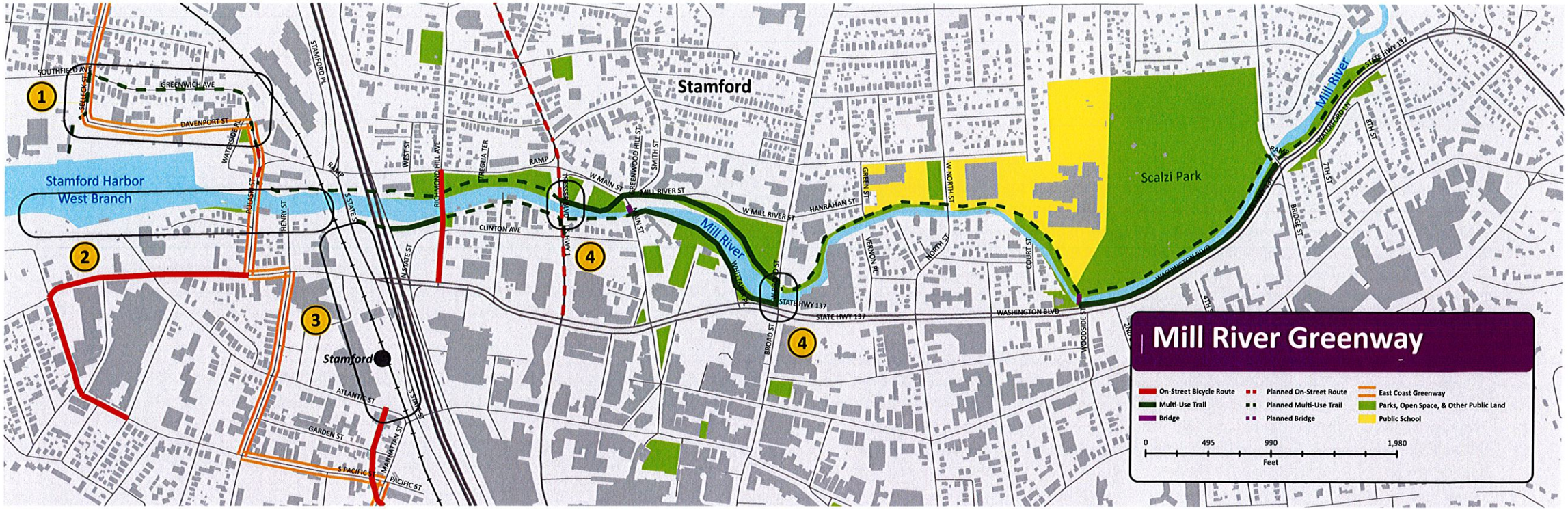
Implementation

Next Steps

- Continue to build out the trail and associated amenities between Tresser Boulevard and Broad Street as part of the larger park project.
- Obtain funding for and build the Greenwich Avenue TCSP project.

Long Term

- Connect the trail head at Broad Street to Scalzi Park along the west side of the Mill River.
- Reconstruct the trail on the east side of the Mill River between Scalzi Park and Vincent Horan Park so that it meets modern AASHTO design standards for a multi-use path / sidepath.
- Continue trail south of Tresser Boulevard to the I-95 bridge over the Mill River and Pulaski Street.
- Connect the trail to the Stamford Transportation Center
- Add adequate crossing treatments where the trail intersects major streets.



(1) Greenwich Avenue TCSP Project

The City of Stamford has proposed reconstructing Greenwich Avenue and Davenport Street from Pulaski Street to Selleck Street. Included in the project is a shared-use side path along Greenwich Avenue from Pulaski Street to a new public access point on the West Branch of Stamford Harbor. If successful, this type of shared-use side path could be replicated elsewhere in Stamford and the Region where a multi-use trail in its own right-of-way is not possible. Of note: The interim on-street routing for the East Coast Greenway currently follows this route.

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(2) South End Connection

The current alignment of the Mill River Greenway brings it close but does not connect it with the major redevelopment underway in Stamford's South End. This is partially attributable to the barriers created by the railroad and port facilities located between the Greenway and redevelopment area. Baring any major changes, an on-street connection is the only viable means to link the Greenway to the new housing and commercial development in Stamford's South End.

(3) Transportation Center Connection

The current alignment of the Mill River Greenway brings it close but does not make a direct connection to the Stamford Transportation Center (STC). Many bicyclists and pedestrians who currently use Washington Boulevard to access the STC may opt to use the Greenway when it becomes available. Because of the heavy traffic generated by the STC and the I-95 entrance and exit ramps, the short distance between the Greenway and the STC is not necessarily friendly, especially to bicyclists. A dedicated, safe route between the Greenway and STC may forestall future conflicts in this congested area and help link the Greenway and Stamford Urban Transitway.

(4) Major Intersections

Where the Mill River Greenway traverses US 1 (Tresser Boulevard) and Broad Street, crossing treatments are needed to allow bicyclists and pedestrians to safely and conveniently cross. If possible, the Greenway should take advantage of the grade separation between the street and the Mill River at these points and cross beneath the street. If this is not possible, than due consideration should be given to street crossing that are both safe and convenient for motorized

Norwalk River Valley Trail

Description

The Norwalk River Valley Trail is a major, planned multi-use trail that would generally follow the course of the Norwalk River from Wilton to where the river meets the Long Island Sound in Norwalk. The full extent of the trail would extend north of Wilton into Ridgefield, Redding, and Danbury. The trail would parallel US 7 and the Metro-North Railroad Danbury Branch. The trail should provide an alternative for cyclists and pedestrians to US 7, which is characterized by high traffic volumes, narrow shoulders, and limited sidewalks, which discourage bicycle and pedestrian use.

A good portion of the trail would be located in land acquired by CTDOT in the 1970s for the US 7 expressway. The fate of the expressway, known as "Super 7", has been subject to contentious debate for the last four decades. Although much of the land necessary for the expressway in Norwalk and Danbury has been acquired, only four miles of expressway in Norwalk were ever built. Given local opposition and perhaps more importantly a lack of funding, there are no realistic plans to extend the expressway at present. As a result, the CTDOT owned land is effectively vacant with some exceptions.

The trail would use both the built and unbuilt portions of CTDOT right-of-way. In Norwalk, a section of trail was built directly adjacent to the expressway within the right-of-way. Further north in Norwalk and Wilton, the trail would use some sections of the unimproved right-of-way. Branches of the trail may also connect to the Merritt-7 office park as well as Wilton center.

The routing presented in this plan is drawn from and largely reflects the routing recommended in the SWRPA *Norwalk River Valley/Route 7 Linear Trail* report. In 2012, the Norwalk River Valley Trail Steering Committee completed the detailed *Norwalk River Valley Trail Routing Study*, which provides more details on the trail alignment than are presented in this plan.

Route

Although named after a river, the trail would generally follow the route of the US 7 expressway right-of-way. The trail would begin at Calf Pasture Beach, a City of Norwalk park on Long Island Sound. Between Calf Pasture Beach and the Maritime Aquarium, the trail would follow an on-road alignment via Calf Pasture Beach Road, Marvin Street, Gregory Boulevard, 1st Street, and Seaview Avenue. The trail would use the Stroffolino Bridge (CT 136) to cross the Norwalk River and then follow Water Street to the Maritime Aquarium. From here north to Lockwood Matthews Park and Union Park, the trail has already been built as an off-road multi-use trail.

Going north from Union Park, an off-road multi-use trail would follow the west bank of the Norwalk River along Riverside Drive. Just north of New Canaan Avenue, a section of trail was built by Connecticut Light & Power around a power sub-station as part of their 345 kV transmission line upgrade project. North of the sub-station, an off-road multi-use trail would follow the US 7 expressway right-of-way to Perry Avenue. At Perry Avenue, the trail would branch, with one section heading to a trailhead at the Merritt-7 office complex and the other continuing north, off-road, in a shared alignment with the Merritt Parkway Trail, around the west side of the US 7 – CT 15 interchange.

North of the interchange, the trail would continue to follow the US 7 expressway right-of-way as an off-road multi-use trail past Grist Mill Road towards Wolfit Road in Wilton. Here, the trail would again branch. The west branch would follow Wolfpit Road and River Road past Wilton center and Wilton High School to Allen Meadows Park via a combination of on-road and off-route alignment. The east branch would follow the US 7 expressway right-of-way as a hiking trail to Cannondale before meeting up with the west branch near Allen Meadows Park.

Summary Statistics

Length

19.61 miles (4.07 miles completed)

Alignment

Off-Road: 16.18 miles (83%)
On-Road: 3.42 miles (17%)

Status

Complete: 20.8%
Design: 13.2%
Planned: 66.0%

Estimated Construction Cost

Trail	
Off-Road:	$8.8 million
On-Road:	$0.1 million
Intersections:	$0.5 million
Engineering:	$5.2 million
Contingency:	$0.9 million
Total:	$15.4 million

Planning Context

Land Ownership

- Public:
  - US 7 expressway right-of-way
  - Merritt Parkway right-of-way
  - Public parks
    - Calf Pasture Beach
    - Veterans Park
    - Oyster Shell Park
    - Lockwood Mathews Park
    - Union Park
    - Old Ridgefield Road Open Space
    - Merwin Meadows Park
    - Allen Meadows Park
  - State and town controlled streets

Intermodal Connections

- Metro-North
  - Merritt 7
  - Wilton
  - Cannondale
- Norwalk Transit District
  - 1, 2, 3, 9, 10, 11, 12, 13, 7-Link
- CT Transit
  - Route 41

Major Constraints

- Use of US 7 expressway right-of-way: The proposed trail alignment would utilize sections of the extant but unused US 7 expressway right-of-way in Norwalk and Wilton. To do so, CTDOT would need to give their permission. If CTDOT does allow this use of the property, the trail would need to be routed in such a way as to not preclude future undetermined uses of the right-of-way.
- Rails with trails: A section of the trail in South Wilton and the branch to Merritt-7 would be located adjacent to the Metro-North Danbury Branch. Adequate separation and safety measures must be in place to prevent trail users from trespassing on the railroad.
- Additional constraints are identified and described on the detailed Norwalk River Valley Trail maps.

Implementation

Next Steps

- Design and build the section of trail between Union Park and New Canaan Avenue in Norwalk, connecting to already built section around the Connecticut Light & Power sub-station.
- Design the portion of trail between CL&P substation and US 7 – CT 15 interchange
- Obtain public and private funding to construct the trail in Wilton.
- Obtain funding to build a bridge across the Norwalk River in Wilton, connecting the trail to the Wilton rail station.

Long Term

- Construct a paved trail between Broad Street and Perry Avenue (just south of the US 7 – CT 15 interchange / Merritt-7 office park).
- Include trail as part of design and reconstruction of US 7 – CT 15 interchange in conjunction with Merritt Parkway Trail.
- Complete trail between US 7 – CT 15 interchange and Merwin Meadows Park
- Complete full length of trail between Norwalk and Danbury.

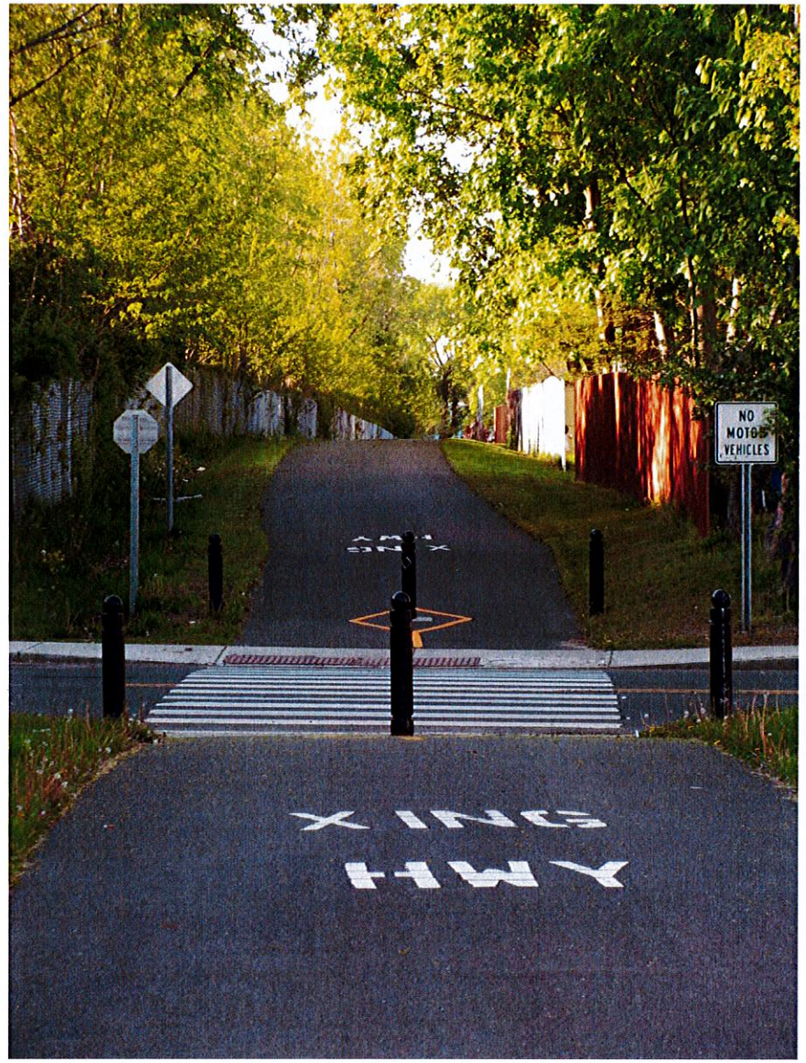
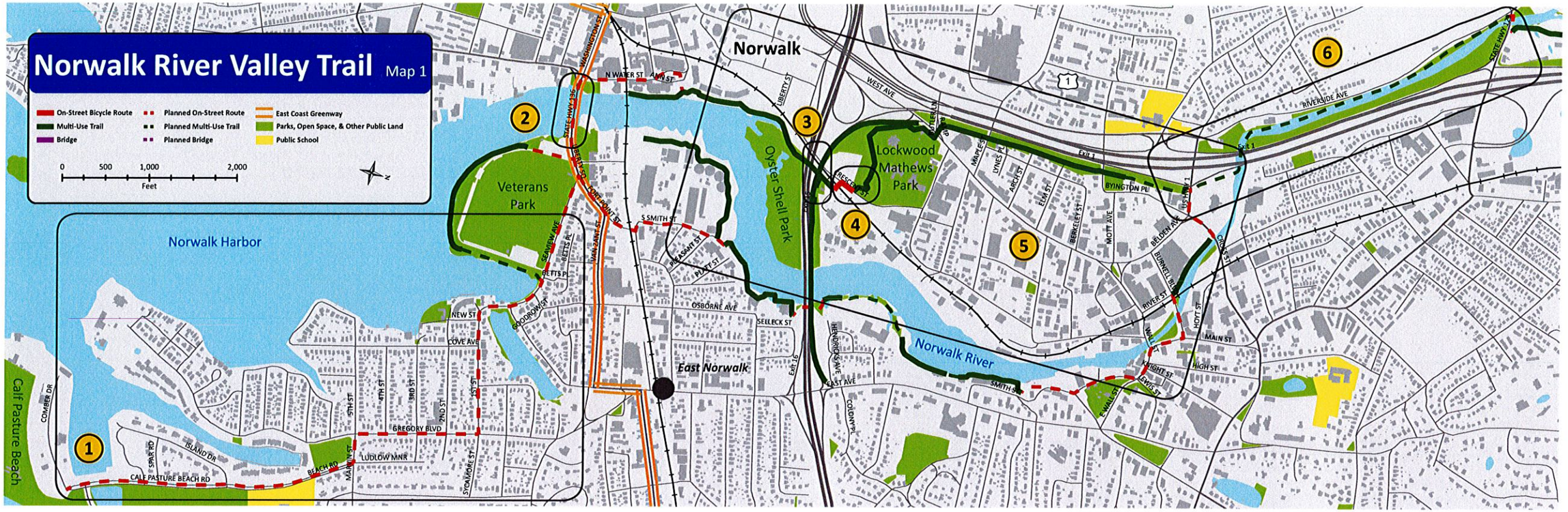


Figure 52: The Norwalk River Valley Trail crosses Maple Street in Norwalk[56].



(1) On-Road Accomodations

Between Calf Pasture Beach and Veterans Park, the trail would follow an on-street alignment. Although sidewalks are generally present throughout this area, there are not currently any signed or marked on-street bicycle facilities. To improve safety and create an identity for the trail, on-street bicycle facilities, highly visible pedestrian crossings, and wayfinding signage should be present. Norwalk's regular paving program presents a good opportunity to provide these facilities.

(2) Stroffolino Bridge

The Stoffolino Bridge carries CT 136 across the Norwalk River and links East and South Norwalk. By narrowing the travel lanes, it may be possible to add bicycle lanes on the bridge. If not, shared lane markings may be an alternative. Existing sidewalks provide adequate accommodation for pedestrians.

(3) Yankee Doodle Bridge

A pedestrian path on the north side of the I-95 Yankee Doodle Bridge connects East Avenue in East Norwalk and Lockwood Mathews Park. At present, the path is poorly marked at either end, which decreases its visibility and discourages use. Providing a connection between the Norwalk River Valley Trail and the Yankee Doodle Bridge path where they cross would increase accessibility and mobility. Any reconstruction of the Yankee Doodle Bridge should include a wider path that can better accommodate bicycles.

(4) Crescent Street

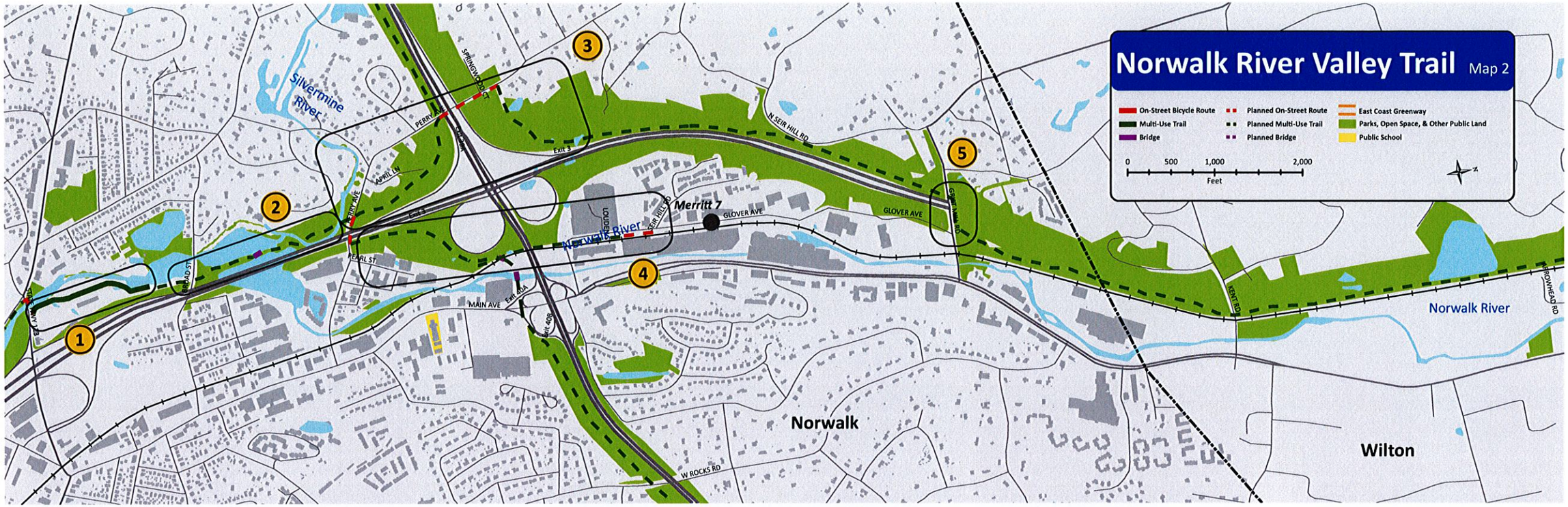
Going north from the Maritime Aquarium, the trails ends at Crescent Street without any signage or markings directing trail users to the next segment. A safe on-street route with signage and markings is needed for this short segment.

(5) Connectivity Plan

Norwalk Redevelopment Agency's Connectivity Plan recommends a series of bicycle and pedestrians improvements in the West Avenue corridor between the South Norwalk rail station and Wall Street. Chief among these are improved bicycle and pedestrian facilities on West Avenue and intersecting streets, an extended Academy Street, a bicycle route on Crescent Street, and improved signage. These improvements would support major redevelopment planned in the corridor.

(5) Riverside Avenue

The City of Norwalk has begun engineering design for the next segment of the trail from the current terminus at Union Park north to CT 123 (New Canaan Avenue) and the CL&P transformer station. Funding should be sought for construction.



(1) CL&P Trail

A few years back, Connecticut Light & Power (CL&P) built a 2,100' section of the trail around a transformer station as part of its 345 kV transmission line project. This section will bring the trail from New Canaan Avenue to Broad Street. A recent CTDOT project to replace the CT 123 (New Canaan Avenue) bridge over the Norwalk River included a pedestrian crossing at the nearby intersection and sidewalks on both sides of the bridge.

(2) CL&P Transmission Lines

North of Broad Street, the trail is expected to follow CL&P's right-of-way. CL&P already has an access road in this area and previously expressed a willingness to allow the trail to use its right-of-way. However, trail access may be subject to temporary use restrictions when CL&P performs maintenance on its transmission lines. A bridge will be necessary to bring the trail across the Norwalk River in the vicinity of Deering Pond.

(3) US 7 - CT 15 Interchange

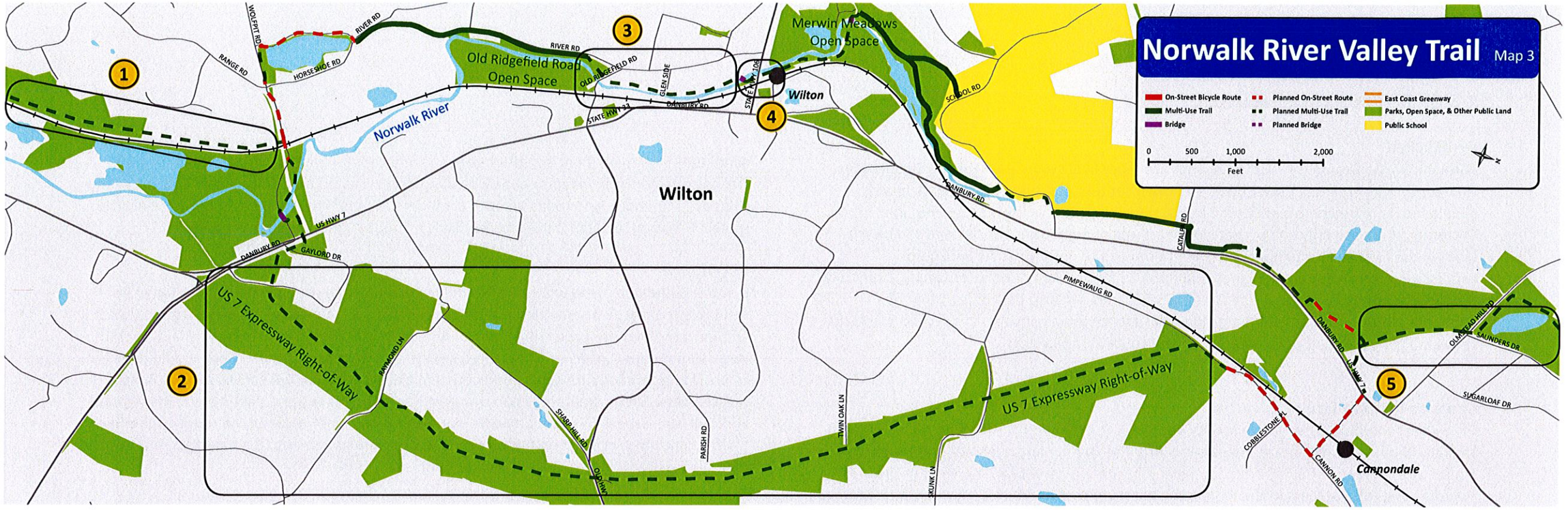
North of Perry Avenue, the trail must traverse an area dominated by the US 7 – CT 15 interchange. This area deserves a great deal of attention because of the planned improvements to the interchange, its potential as a junction with the Merritt Parkway Trail, and the presence of the Merritt-7 office park. Although plans to improve the interchange are stalled at present, the last viable design concept (alternate #21c) showed a path around the interchange for both the Norwalk River Valley and Merritt Parkway Trails, including a section shared by both. The Norwalk River Valley Trail would use an exclusive right-of-way around the southwest quadrant of the interchange and then use Perry Avenue to cross the Merritt Parkway. From there, the trail would veer back towards the Route 7 right-of-way.

(4) Merritt-7 Connection

If both the Norwalk River Valley and Merritt Parkway Trails are realized as conceived in alternate #21C, it may be possible to create a short spur trail to Glover Avenue. This spur would provide access from both trails to the Merritt-7 office park and rail station. The spur would originate in the southeast quadrant of the interchange and pass beneath the interchange ramps and Merritt Parkway using the existing railroad right-of-way. This alignment would provide a more direct link that avoids busy Main Avenue and its interchange with the Merritt Parkway.

(5) Grist Mill Road Crossing

A safe crossing is needed where the Route 7 expressway ends at Grist Mill Road. The location is now subject to heavy traffic, has no pedestrian accommodations, and is unfriendly to bicycles. A highly visible crosswalk and median treatment east of the expressway would bring the trail to the north side of Grist Mill Road. A shared use path would then bring the trail over to the existing CL&P access road north of Glover Avenue. Should the US 7 expressway ever be extended north, a grade separation from Grist Mill Road may be possible.



(1) Rails with Trails

From Grist Mill Road in Norwalk to Wolfpit Road in Wilton, the trail would follow the Danbury Branch railroad and CL&P transmission lines. Due to the difficulty and expense of creating new pedestrian crossings over the railroad, the trail should use existing street crossing when necessary. Adequate separation and safety measures must be in place to prevent trail users from trespassing on the railroad. Though there are many examples of rails-with-trails in the United States, it is without precedent in Connecticut.

(2) US 7 Expessway Right-of-Way

The state acquired a considerable right-of-way for the US 7 expressway. Although it might seem appealing for the trail to only follow this right-of-way, its remote location poses challenges with regards wetlands, topography, and its usefulness as a transportation route. Instead, a route closer to the Norwalk River though Wilton Center would take advantage of existing trail segments and connect to more destinations. A hiking trail may be a more appropriate use for this section of the US 7 expressway right-of-way. Any trail through the US 7 expressway right-of-way would require CTDOT permission and should be aligned so that it does not preclude any future transportation use of the corridor.

(3) Wilton Center

To create an exclusive trail alignment through Wilton Center, property behind the businesses on the east side of Old Ridgefield Road would need to grant public access. Many communities, including Norwalk, have used their zoning regulations to obtain waterfront easements for trails. An on-street route would be appropriate in the near term. From Wilton Center through Merwin Meadows Open Space north to the schools on School Road, the NRVT could follow existing trails.

(4) Wilton Rail Station Bridge

The Town of Wilton has indicated a need for a pedestrian bridge across the Norwalk River in the vicinity of the Wilton rail station. A bridge at this location would connect the Wilton rail station to Wilton Center and the trail and allow people to park at the rail station or ride the train to use the trail.

(5) North of Cannondale

North of the Cannondale rail station, the Route 7 expressway right-of-way is the only viable way for the trail north towards Danbury. The area surrounding the proposed trail is generally less developed than it is south of Cannondale rail station and wetlands and topography will be a greater factor. A hiking trail may be more appropriate for this section. Any trail through the US 7 expressway right-of-way should be aligned so that it does not preclude any future transportation use of the corridor.

4-3 On-Street Bicycle Network

Introduction

Throughout the Region, on-street facilities are more likely to be available for pedestrians than for cyclists. In most downtowns and town centers, the sidewalk network is well developed. In low-density residential areas, sidewalks are less likely to be available. Currently, there are only a few relatively short, unconnected sections of on-road bicycle lanes in the Region. Though bicyclists are permitted to use all streets except for expressways, on-street bicycle lanes represent a higher quality and safer facility, especially for average or novice cyclists. On-street bicycle lanes can also be a component of a complete street. Though adequate sidewalks are always a concern, this section will focus on planning a system of designated on-street routes for bicyclists.

Choosing the right facility

Planning the appropriate bicycle facility depends on street and traffic conditions. Among the conditions to consider are the street width, the volume and speed of motor vehicle traffic, the presence of on-street parking, and pavement condition. On most of the low volume residential streets in the Region, bicycles and motor vehicles may operate together without any additional facilities for bicycles. However, when motor vehicle traffic volumes or speed are greater and conflict with the operational characteristics of bicycles, separate bicycle facilities may be warranted.

Shoulders

On low volume, low speed residential streets, it may not be necessary to provide any sort of bicycle accommodation. Bicycles and automobiles should be able to share the road without many conflicts. In less populated areas, an adequate paved shoulder of at least 4' may be sufficient to accommodate bicycles. If a street is sufficiently wide, the easiest way to establish a shoulder is to stripe it. If an existing shoulder is too narrow, it may be desirable to reapportion part of the vehicle travel lane to the shoulder. Narrower vehicle lanes can also help to reduce speeding but may not be desirable in circumstances such as when a street accommodates large commercial vehicle traffic or is intended for higher vehicle speeds. Perhaps the best time to add or modify shoulder width is when a street is repaved. If a shoulder is intended for use by bicycles, it is important that the pavement is in good condition. Poor pavement conditions are a safety concern for bicyclists, both in terms of crashes caused by the pavement as well as conflicts created by maneuvers in and out of the shoulder. On multi-lane roads without shoulders, a wider curb lane could facilitate bicycle travel. However, a wider curb lane will likely encourage motor vehicle speeding,

Bicycle Lanes

In more populated areas where traffic volumes and bicycle use may be higher, it may be desirable to provide a separate lane for bicyclists to use. A bicycle lane should give cyclists and motorists a more predictable idea of where cyclists should ride. A bicycle lane should be at a minimum 4' wide or 5' if located next to a curb or parked cars. Care should be given to providing an adequate separation between bicyclist and parked cars to avoid conflicts. Bicycle lanes can be created by narrowing motor vehicle lanes or a parking lane if adequate width exists. Especially in urban areas, narrower motor vehicle lanes can reduce speeding traffic, which may conflict with bicycle and pedestrian movement. If a bicycle lane is desired on a bi-directional street, it should be on both sides of the road.

Shared Lane Markings

A shared lane marking is a relatively new way to create a cycling route where the right-of-way is constrained. The marking consists of a bicyclist stencil and double chevron on the pavement as well as signage. Shared lane markings alert motorists that bicyclists use the street and alert bicyclists where to position themselves to avoid the open doors of parked cars. Shared lane markings may be appropriate where there is insufficient space to create a striped bicycle lane. A shared route may also be appropriate where it provides continuity in the bicycle network.

Intersections

In order to ensure safety, bicycle facility treatments at intersections deserve special considerations. One common intersection treatment involves a bicycle lane going straight through an intersection while motor vehicles are given an exclusive right turn lane. In this circumstance, it is necessary to shift the bicycle lane from the location closest to the curb to the left of the exclusive right turn lane. In order to alert bicyclists and motorists of this

change, the bicycle lane marking changes from solid to dotted to denote the merge. This treatment is preferable to keeping the bicycle lane to the right of the exclusive right turn vehicle lane, which would create a conflict between thru bicyclists and right turning motorists.

Where a bicycle route makes a left turn at an intersection, there are two possibilities. Perhaps the simplest treatment is for the bicyclist to make a two-step maneuver. First, the cyclists goes straight through the intersection to the opposite corner, where they turn left and wait for the cross-street green to complete the maneuver. This obviates the need for the cyclist to move from the bicycle lane to a dedicated left-turn lane, which may be difficult on multi-lane streets. Another possibility is to provide a "bike box" at an intersection in front of the stop bar. The bike box lets cyclists cross over to the left turn lane safely in front of motor vehicles while they are stopped at the intersection. From the left turn lane, cyclists can proceed through when safe just as a motor vehicle would do. At present, there are no bike boxes in Connecticut.

Network Considerations

On-street bicycle facilities will be most useful to cyclists if they provide a desirable routing between origin and destination. Cyclists will, like any other traveler, avoid routes that are circuitous or add considerably to travel time. Similarly, cyclists will be without options if a route ends without any further accommodation or indication how to continue. Like any other traveler, bicyclists prefer a logical, convenient route network.

Since the South Western Region has just a few short on-street bicycle facilities, a pilot project is a logical first step to establish to establish an on-street facility. Often, this work can be accomplished in cooperation with local bicycle advocacy organizations, who can suggest routes based on user experience. Given the complexity of working through the State's process to make changes to State highways, municipalities are well advised to focus on the streets they maintain. A pilot project need not be large or comprehensive. Establishing a bicycle route of a mile or less can be sufficient to serve the needs of cyclists. Destinations served by a pilot project might be a downtown or town center, park or beach, or rail station. For instance, a good pilot project might link a downtown or a rail station to a nearby residential neighborhood. A pilot route, like any bicycle route, should be two-way. A route than does not have a corresponding return route shows a disregard for the needs of cyclists. Pilot routes may also be preferable because they allow municipal officials and staff to become comfortable with providing bicycle facilities.

Although circuitous bicycle routes should be avoided, it may not be desirable to add bicycle facilities to principal highways if alternative streets are available. For instance, bicyclists may try to avoid high volume, high speed routes, especially if the shoulder is narrow or non-existent. This is a common characteristic of US 1 though the South Western Region. Providing a bicycle facility on a parallel street with lower traffic volumes and speeds may therefore be more suitable.

SWRPA Corridor Studies

In the last few years, SWRPA completed two major corridor studies that recommended complete streets improvement to enhance bicycle and pedestrian mobility and mitigate motor vehicle congestion. The two studies, the Darien *Route 1 Corridor Study* and the *Route 1 Greenwich-Stamford Study*, tackle sections of the Post Road that function not only as important traffic arterials but also as the main streets for the neighborhoods and communities through which they pass. Therefore, both studies had to tackle the difficult task of balancing the sometimes competing but often complimentary needs of motorized and non-motorized users.

Darien Route 1 Corridor Study

The Darien *Route 1 Corridor Study* examined US 1 (Boston Post Road) from Nearwater Lane to Old Kings Highway through the center of Darien. The corridor traverses the compact, mixed use downtown and is constrained by a low railroad bridge, which often creates a safety hazard for large trucks. The examination considered the needs of all users in the corridor in light of future downtown development opportunities. Realizing there is limited opportunity to add significantly increase capacity, the study recommends complete streets improvements to improve mobility for motorized and non-motorized users as well as land use strategies that will allow for development in character with the existing build environment.

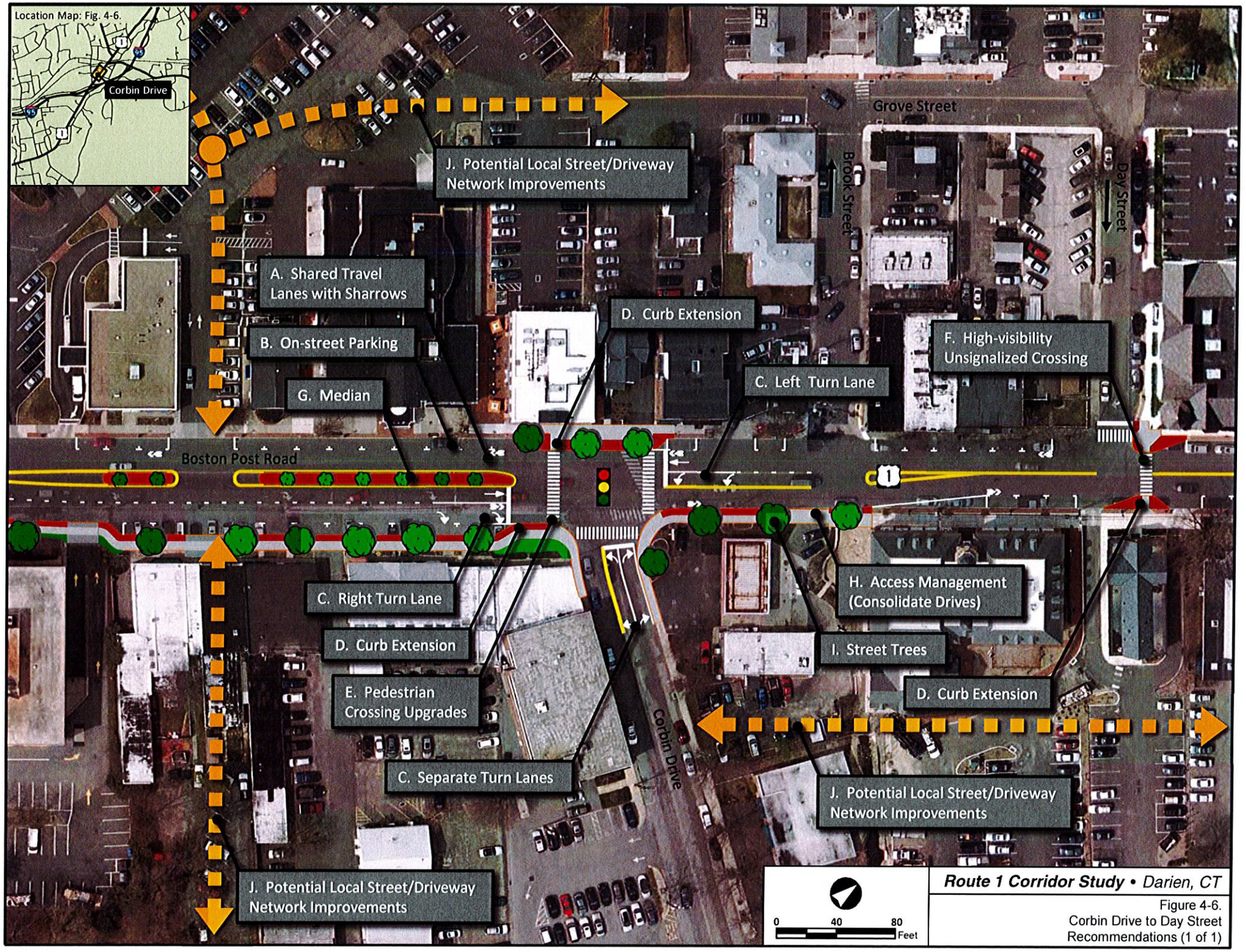
On the South Corridor section from Nearwater Lane to I-95 Exit 11, the study proposes a road diet that would reduce the existing four-lane cross section to three lanes (two thru lanes and a center two way left turn lane). The balance of the street would be given over to bicycle and pedestrian facilities, including bicycle lanes and median refuges for pedestrians at some intersections. A road diet in this location would also make room to fill in gaps in the sidewalk on the northbound side of the highway.

Figure 56: Rendering of a road diet, including new sidewalks, pedestrian crosswalks, and a median on Route 1 and Old Kings Highway South in Darien.[57].

Through the Downtown section, the study recognizes the constrained context, where thru traffic, parking, and pedestrians all must share a limited space. The bicycle and pedestrian facilities recommended by the study include shared right-of-way markings for bicyclists on US 1 (Boston Post Road) as well as curb extensions, channelized islands, and new signals for pedestrians. Curb extensions would benefit pedestrians by shortening the distance to cross US 1 and by making crossing pedestrians more visible to motorists. Pedestrian crossings would be further highlighted by high visibility crosswalks. In order to build the curb extensions, a small number of on-street parking stalls would have to be removed.

Figure 57: Rendering of a new curb extension, high visibility crosswalk, and landscaped median on Route 1 and Corbin Drive in downtown Darien.[58].

On the North Corridor section from Sedgwick Avenue to Old Kings Highway North, the study proposes a road diet to benefit motorists as well as bicyclists and pedestrians. To better define the street, the two wide, existing lanes would become two, narrower thru lanes and a two-way center left lane. Better delineating the motor vehicle travel lane would provide sufficient space to create four foot shoulders, which would benefit bicycle travel. New sidewalks and pedestrian crossing upgrades in the form of new signals, curb ramps, and high visibility crosswalks would benefit pedestrian travel.


Location Map: Fig. 4-6.
Corbin Drive
J. Potential Local Street/Driveway Network Improvements
Grove Street
Brook Street
Day Street
A. Shared Travel Lanes with Sharrows
B. On-street Parking
G. Median
D. Curb Extension
C. Left Turn Lane
F. High-visibility Unsignalized Crossing
Boston Post Road
1
C. Right Turn Lane
D. Curb Extension
E. Pedestrian Crossing Upgrades
C. Separate Turn Lanes
H. Access Management (Consolidate Drives)
I. Street Trees
D. Curb Extension
Corbin Drive
J. Potential Local Street/Driveway Network Improvements
J. Potential Local Street/Driveway Network Improvements
0
40
80
Feet
Route 1 Corridor Study • Darien, CT
Figure 4-6.
Corbin Drive to Day Street
Recommendations (1 of 1)

Route 1 – Greenwich-Stamford Study

The *Route 1 Greenwich-Stamford Study* examined US 1 from the New York State border to Washington Boulevard in downtown Stamford. The nearly seven mile corridor traverses through several neighborhoods in two municipalities, each with different characteristics and context. The overall purpose of the study was to improve traffic operations, improve safety for all users, manage access, accommodate transit, and enhance the corridor's economic potential. The study presents a coordinated plan to address the conflicts, such as traffic congestion, pedestrian unfriendliness, and diminished community character, created by multiple roles played by Route 1. The complete streets improvements recommended by the study attempt to balance the needs of as well as enhance the mobility of motorized and non-motorized users.

Through the West Side of Stamford, the study proposes to better define the street while making major improvements at several key intersections. At the US 1 – Greenwich Avenue intersection, the study proposes a modern, modified single lane roundabout to improve motorist safety while also shortening the distance pedestrians need to cross. Following US 1 up the hill, the study proposes to more clearly define the narrow roadway by adding street trees and bulb outs at intersections to improve the pedestrian environment. At the US 1 – Richmond Hill Avenue intersection, the study proposed to realign the geometry of the intersection. Simplifying the intersection geometry here would improve motorist safety and reduce pedestrian crossing distances while also reclaiming pavement as a new public space. Going south, the study proposes a road diet, which would create a shoulder space for bicyclists, and a roundabout at the US 1 – Alvord Lane intersection, which would reduce pedestrian crossing distances.

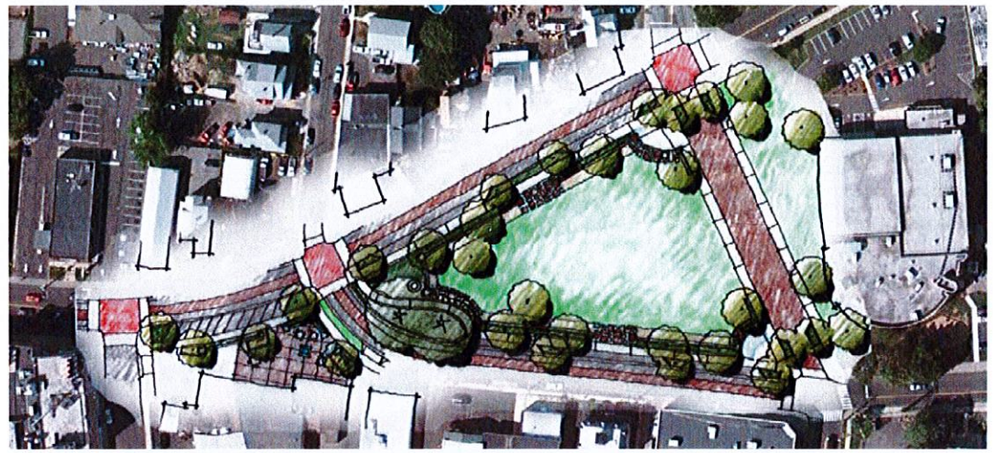


Figure 59: Proposed improvements to Route 1 in the vicinity of Jackie Robinson Park in Stamford, including a realigned intersection with Richmond Hill Avenue, a new public space, and a road diet[59].

Through Cos Cob "Hub" area in Greenwich, the study proposes a road diet that would reduce delay for motorists and make the area friendlier to bicyclists and pedestrians. As present, the three traffic signals at Route 1 intersections are on one signal controller and pedestrians are given an exclusive signal phase. When a pedestrian hits the button to cross, it shuts down all three intersections to vehicle traffic, resulting in long delays. Further, the lack of left turn lanes in the area further exacerbate this delay as motorists queue up behind left hand turners. Reducing the crossing distance for pedestrians and converting the pedestrian phase from exclusive to concurrent would allow signal time now devoted to pedestrian movements to instead be given oven to thru traffic on Route 1. Therefore and somewhat conterintuitively, narrowing the street cross section in the Hub will reduce motorist delay while at the same time making the area more friendly to pedestrians patronizing local businesses. North and south of the Hub, the study proposes a four lane-to-three lane road diet, which would create shoulder space for bicyclists.

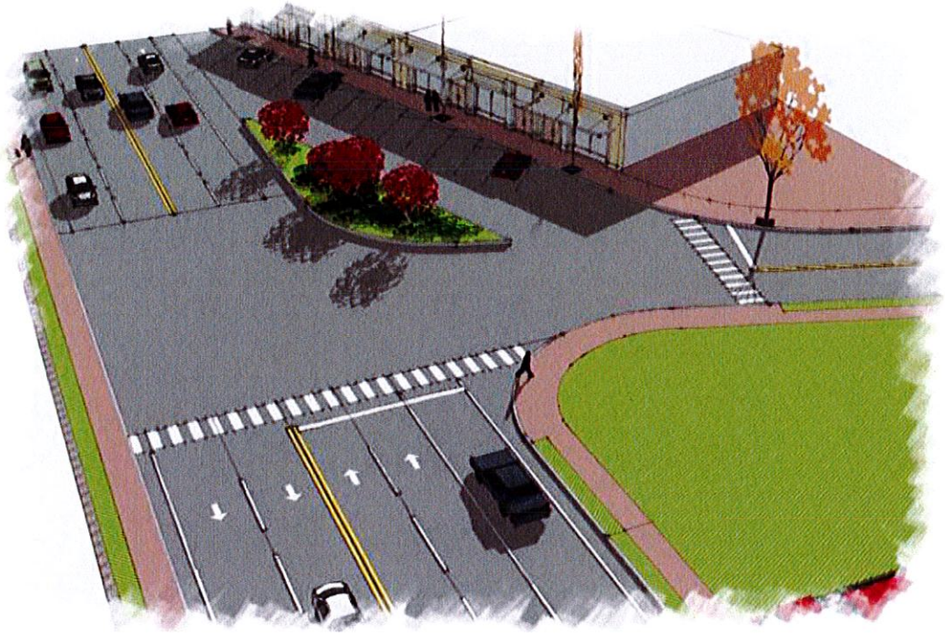


Figure 60: The existing conditions at Route 1 and Sinawoy Road in the Cos Cob "Hub"[60].

Figure 61: Proposed improvements to Route 1 and Sinawoy Road in the Cos Cob "Hub". Changes to the cross section and traffic signal timing would make it easier for pedestrians to cross Route, provide room for bicycle lanes, and relieve vehicle queues[61].

Complete Streets Policy

While pilot projects are a good starting point, the ultimate goal should be to mainline bicycle accommodations into municipal street maintenance and improvement programs. One way for a community to realize this is by adopting a complete streets policy. A complete street is one that is safe and accessible for all road uses. Complete streets stand in contrast to typical streets you find today around Connecticut, which are almost exclusively designed for motor vehicles. Implementing a complete streets program need not be costly. For instance, a complete streets policy might have the effect of making bicycle accommodations a routine part of the street repaving. Numerous states and communities across the nation have adopted complete streets policies. Locally, both the State of Connecticut and the City of New Haven have passed complete streets policies into law. Several Metropolitan Planning Organizations across the nation have also adopted complete streets policies.

Footnotes

[1] http://www.fhwa.dot.gov/environment/bikeped/policy_accom.htm
[2] ibid.
[3] ibid.
[4] ibid.
[5] ibid.
[6] ibid.
[7] ibid.
[8] ibid.
[9] CGS §13a-153f(b)
[10] CGS §13b-13a(e)
[11] 23 U.S.C. § 133.
[12] Connecticut 2009 Statewide Bicycle and Pedestrian Transportation Plan, Connecticut Department of Transportation, 2009.
[13] GBRPA, Bike_Ped Policy Statement, 1
[14] Cervero, 1481
[15] Ibid, 1482
[16] SWRPA.
[17] *South Western Region Rail Station Parking Study*, 2009.
[18] http://www.swrpa.org/Uploads/Appendix_C_BicycleStorageCapacityReport.pdf
[19] SWRPA
[20] http://www.census.gov/main/www/pums.html
[21] PUMAs 02300 and 02500. 02500 covers Stamford and 02300 covers the remainder of the South Western Region. http://ftp2.census.gov/geo/maps/puma/puma2k/ct_puma5.pdf
*2000 Census of Population and Housing, 5% Public Use Microdata Sample.
[22] SWRPA.
[23] Bicycles are referred to as 'pedalcycles' in CTDOT's Traffic Accident Viewer System.
[24] SWRPA.
[25] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=1442
[26] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=1451
[27] Carl Sundstrom, http://www.pedbikeimages.org/pubdetail.cfm?picid=622
[28] Carl Sundstrom, http://www.pedbikeimages.org/pubdetail.cfm?picid=574
[29] Carl Sundstrom, http://www.pedbikeimages.org/pubdetail.cfm?picid=586
[30] Laura Sandt, http://www.pedbikeimages.org/pubdetail.cfm?picid=1391
[31] Tom Harned, http://www.pedbikeimages.org/pubdetail.cfm?picid=1523
[32] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=677
[33] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=738
[34] Richard Drdul, http://en.wikipedia.org/wiki/File:Diverter_with_bollards.jpg
[35] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=1245
[36] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=1024
[37] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=1253
[38] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=418
[39] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=1216
[40] James Wagner, http://www.pedbikeimages.org/pubdetail.cfm?picid=1139
[41] Peter Speer, http://www.pedbikeimages.org/pubdetail.cfm?picid=1367
[42] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=1247
[43] Dan Burden, http://www.pedbikeimages.org/pubdetail.cfm?picid=687
[44] Sarah Heaton Kennedy, http://www.pedbikeimages.org/pubdetail.cfm?picid=1512
[45] Farmington Valley Trails Council, map 6, http://www.fvgreenway.org/Map6/index.php#mapstart
[46] CGS §14-232 (a)
[47] Alex Karman
[48] *South Western Region Bicycle and Pedestrian Safety Corridor Study*
[49] Ibid.
[50] Ibid.
[51] Ibid.
[52] http://www.pedbikeimages.org/largeimages/travel_016.jpg
[53] http://2.bp.blogspot.com/_eEVEOlBgnMc/Sn90sxhxO1I/AAAAAAAAAE0/bgZiWYABzlc/s1600/IMG_6723.JPG
[54] Alex Karman
[55] http://www.pedbikeimages.org/largeimages/federal-way-yield-to-ped-sign-with-van.jpg
[56] Alex Karman
[57] Route 1 Corridor Study: Darien, CT. 4-11
[58] Route 1 Corridor Study: Darien, CT. 4-36
[59] Route 1 Greenwich-Stamford Study
[60] Ibid
[61] Ibid