WATERBURY NAUGATUCK RIVER GREENWAY ROUTING AND FEASIBILITY STUDY

WATERBURY, CONNECTICUT

FINAL REPORT

WATERBURY
Development Corporation

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PLANNING + DESIGN

FEBRUARY 2010

This project has been funded by a grant from
the United Way of Greater Waterbury

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All photos courtesy of the Alta Planning + Design team, unless otherwise noted.

I. Overview

This study describes the proposed route for the Waterbury Naugatuck River Greenway. For this study, a greenway is defined as "a corridor of land that connects people and nature together" and a trail is defined as "a linear facility for non-motorized transportation and recreation." The purpose of the study is to identify the route of the proposed trail within the 7.1-mile greenway corridor along the Naugatuck River in Waterbury, Connecticut. The trail is intended to serve primarily as a shared-use path for pedestrians and bicyclists separated from motorized traffic. It will probably not be plowed in winter, but could be used by cross-country skiers. This study makes recommendations for the trail and related improvements such as trailheads, canoe/kayak landings viewpoints and wayfinding.

The Naugatuck River is Waterbury's primary natural resource, yet it winds almost invisibly through the city. The river has an important industrial heritage and has significant potential for revitalization. The recent signing of Public Act 09-235 by Governor Rell will help to expedite this process as formerly-industrial brownfield sites in urban areas will be easier to clean up. People have a very strong urge to be near bodies of water and the Naugatuck is no exception. Today, a new vision places value on this resource in the heart of the City. Waterbury's new plan of conservation and development recognizes the greenway as the principal component of an interconnected open space plan with a trail that will run through Waterbury and connect to the greenways of other valley cities and towns. The greenway will serve as a sustainable transportation corridor, provide recreation opportunities for residents and visitors, improve quality of life, increase property values adjoining the river and retain and

The Naugatuck River through downtown Waterbury offers a spectacular contrast between the industrial use and natural environment.

Greenways offer prime opportunities for communities to appreciate the outdoors and promote more active living through bicycling and walking.

attract new businesses and residents.

The proposed trail offers options to the community for non-motorized travel, close-to-home outdoor activities, potential economic development and health benefits of regular exercise. These opportunities can help the community become more sustainable, help people be active and healthy, combat obesity in children, and encourage environmental stewardship in trail users of all ages. This study includes benchmarks for measuring these benefits and an evaluation matrix that has been used to identify and analyze greenway alternatives. Alternatives were developed based on factors established in cooperation with the Greenway Advisory Committee, including land ownership, cost, safety and other considerations.

Public Process

The planning work for the Waterbury Naugatuck River Greenway included a robust public process that involved hundreds of people and elicited over 1,000 comments. The core of the consultant team's outreach to stakeholders was through the Greenway Advisory Committee, with whom Alta Planning + Design met regularly throughout the nine-month planning process. The Committee provided valuable comments on draft versions of all technical memoranda, PowerPoint presentations and early drafts of the study.

To connect with the public, two well-publicized community workshops were held at Kennedy High School on April 30th and September 16th, 2009. Both meetings attracted over 100 people and included the Mayor, city aldermen, other elected officials and key figures in Waterbury's business and non-profit communities. Each of the meetings began with a greeting from the Mayor. After a presentation from the consultants, the community broke up into smaller groups to discuss the greenway in

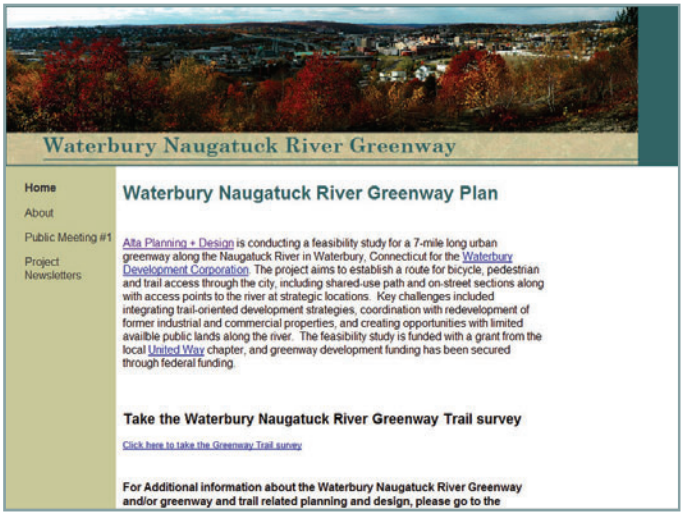
Detailed maps of the river corridor provided opportunities for community discussion during the first public meeting.

Small group discussions included numerous high school and UConn students along with people from throughout Waterbury's many neighborhoods.

Mayor Jarjura kicked off both community meetings with a inspiring welcome and updates on his efforts to bring in state and federal funds for the project.

more intimate detail. Facilitators included staff from Alta Planning + Design, sub-consultants Fuss & O'Neill and Greenways Work, as well as members of the Greenway Advisory Committee.

In addition, a project website was maintained throughout the life of the planning process. The website contained agendas from community meetings and articles about the greenway planning work and PDF copies of meeting presentations for those unable to attend. Included on the site was a link to a survey for interested parties to answer questions ranging from what types of amenities they would like to see along the greenway, to identifying in which neighborhood they lived. Both the website and survey attracted hundreds of interested residents, business owners and city employees.



The project website provided an opportunity for the community to stay up-to-date on the Greenway planning and design process.

Goals and Objectives

The following goals, objectives and benchmarks provide a measurable set of guidelines for the development of the trail along the Naugatuck River in Waterbury. The mission for the Waterbury Naugatuck River Greenway Trail is: "*To connect people and nature along the Naugatuck River in Waterbury*." Based on this mission, the following goals and benchmarks were identified:

Goal 1: Build a connected greenway trail along the Naugatuck River in Waterbury, CT. Connectivity is a vital element to the success and use of the greenway. In order for the proposed trail to reach the greatest number of people for use as both a recreation and transportation based facility, users will need access points and connectivity to other facilities.

Objective 1-1: Complete the first three of the six sections identified in this study (see Table 4) in the next three to five years.

Objective 1-2: Complete the entire system within five to eight years.

Benchmark: Number of miles of greenway trail completed.

Benchmark: Number of access points / trailheads completed.

Goal 2: Increase the number of people walking and bicycling for transportation and recreation in Waterbury. U.S. Census - American Communities Survey data from 2005 shows that 0.2% of Connecticut residents bike to work and 2.7% walk to work. The data for New Haven County also shows that walking and bicycling declined by more than 31% between 1990 and 2000 in Waterbury, along with a 1.9% reduction in population.

Objective 2-1: Double the percentage of work and recreational trips made by non-motorized modes in Waterbury by 2020, based on 10-year U.S. Census data.

Objective 2-2: Increase the number of trail users by 5% per year as measured through count data.

Benchmark: Conduct annual counts of pedestrian and bicycle travel at key locations on the trail system using the National Bicycle and Pedestrian Documentation Project methodology.

Goal 3: Increase the rate of physical activity in Waterbury. The Healthy People 2010 national health objectives include reducing the proportion of physically inactive adults and children. The prevalence of obesity among adults in Connecticut is 21.2% according to the CDC; in New Haven County, 25% of all adults are overweight or obese.

Objective 3-1: Quantify the health benefits of the trail in terms of improved health outcomes.

Benchmark: Local survey data on physical activity to achieve national physical activity targets. Source: Connecticut Fitness Challenge, http://www.ctfitnesschallenge.homestead.com/FAQ.html

Goal 4: The Naugatuck River Greenway will support the community's economic development efforts. The Waterbury Development Corporation and other agencies recognize the value of the greenway as an economic development corridor.

Objective 4-1: Leverage trail implementation to create jobs, tourism, and trail-oriented development opportunities.

Benchmark: Quantify investment in terms of project funding, construction jobs, property values, new business creation and land development in the project corridor.

Goal 5: Connect people and nature. The Naugatuck River is a natural asset; the greenway/trail will encourage more people to spend time outdoors in Waterbury. In the landmark book *Last Child in the Woods* author Richard Louv describes the loss of outdoor recreation for children. The trail will connect schools, business, neighborhoods and community programs to support access to nature.

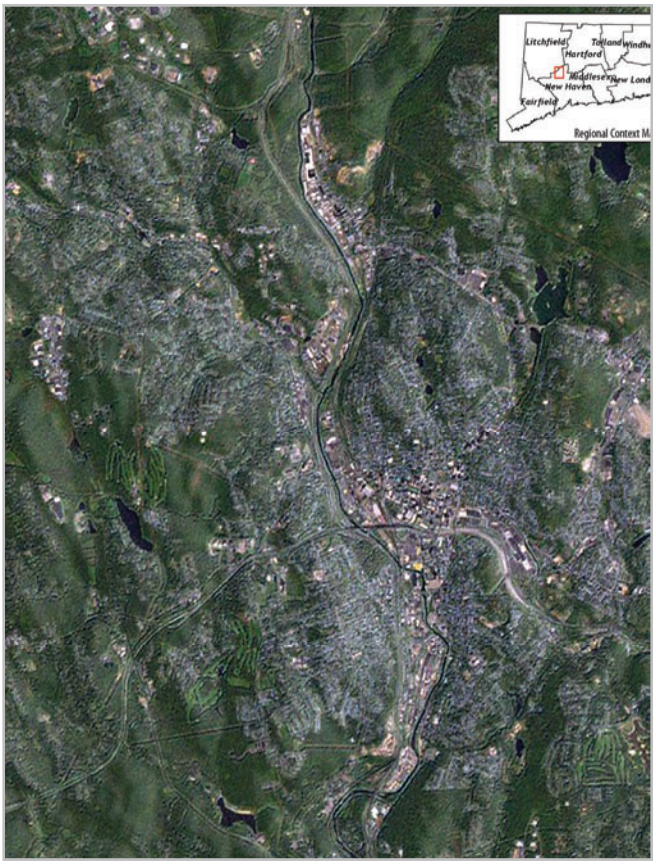
Objective 5-1: Encourage more time spent outdoors along the river.

Benchmark: Percentage of community residents who visit the river; documented participation in outdoor education and recreation programs along the trail.

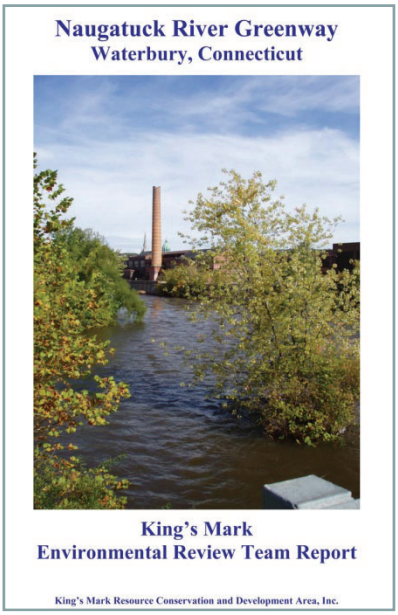
II. Existing Conditions

Overview

This section of this study outlines the physical inventory for the Waterbury Naugatuck River Greenway Routing and Feasibility Study Corridor. The inventory includes the features that were studied in order to develop a comprehensive recommendation for a preferred alignment for the proposed greenway trail. These features include elements that were gathered from GIS information provided by the City of Waterbury and/or Council of Governments of the Central Naugatuck Valley (COGCNV). In addition, on-the-ground fieldwork performed by Alta Planning + Design and Fuss & O'Neill engineers was required to gather information about elements more difficult to obtain through GIS. This included potentially enhanced connections to adjacent neighborhoods, schools and parks and an inventory of possible greenway access points for vehicles, cyclists, kayakers and canoeists. Finally, an invaluable resource was the King's Mark 2006 Naugatuck River Greenway Environmental Review Team Report, which provided information about environmental conditions throughout the corridor. It is important to note that the greenway through Waterbury comes from a recommendation of the State Recreational Trails Plan, which identified the Naugatuck River Greenway as a trail of statewide significance, and designated it as a state greenway trail in 2001.



Satellite photograph of Waterbury CT (GIS based mapping information courtesy of the Council of Governments of the Central Naugatuck Valley).



Physical Features Mapping

Length, Dimensions, Boundaries and Topography

The length of the Naugatuck River Greenway corridor is approximately 7.1 miles. The waterway width remains consistent on its journey from one end of Waterbury to the other, varying between 100 feet and 200 feet for most of its reach. The greenway corridor under consideration, however, ranges from approximately 350 feet to 2,000 feet. This corridor provides the possibility of developing a greenway trail on either side of the river or alongside an adjacent roadway where topographical and other constraints preclude a multi-use path immediately adjacent to the river. The widest swaths of the corridor include numerous commercial and industrial properties that may offer potential trail easements.

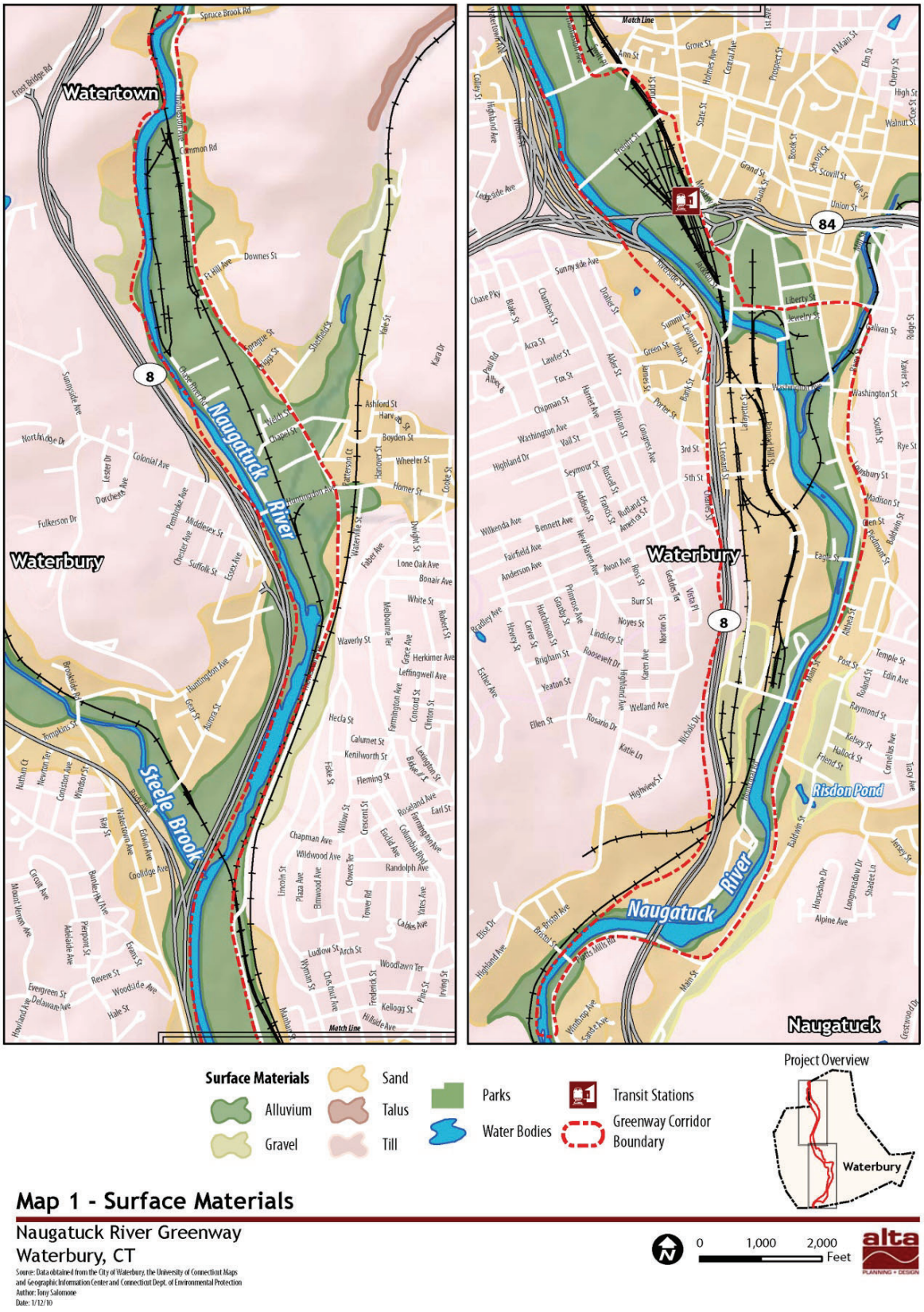
Along many parts of South Main Street, the slopes run very steep down to the river, whereas at Platts Mills Road, the slope is more gradual and sits adjacent to floodways.

Along the entire 7.1 miles, the river drops approximately 90 feet from north to south, at a slope of just under 0.3%. The Waterbury reach is quite flat relative to the entire 45-mile length of the Naugatuck, whose average slope is approximately 1%[1] . The water level is 10 – 20 feet below the grade of most adjacent properties, bridges and/or roadways, with an exception between Huntingdon Avenue and the City line (where the river sits more than 20 feet below the adjacent grade). In many places, the river bank slopes steeply to the water level below, whereas in other locations the most gradual slopes sit adjacent to flood storage areas.

The potential placement of the greenway trail on or along steep slopes needs to be carefully considered because of erosion concerns and potential safety hazards, according to the King's Mark Environmental Review Team report. Trail development on extremely steep slopes could lead to a loss of habitat, disturbance of highly erodible soils (affecting water quality) and create safety issues due to the difficulty of emergency response.

[1] The River drops from a high point of 1,773 feet above Mean Sea Level (MSL) at Dolphin Pond to 15 feet above MSL at the confluence of the Housatonic River, according to the June 2006 Naugatuck River Greenway King's Mark Environmental Review Team Report

Map 1. Surface Materials



Composition of Soils and Geology

According to the Connecticut Department of Environmental Protection (CTDEP) GIS database system (CTDEP, 2003), the soil type is defined as urban land. According to the Surficial Materials Map of Connecticut (Stone, et. al., 1992), subsurface soil present within the greenway corridor boundary consists of sand or flood plain alluvium overlying sand. Flood plain alluvium is described as sand, gravel, silt and organic material on the flood plain of modern streams, whose thickness ranges from five to 25 feet. Sand is described as composed mainly of very coarse to very fine sand, commonly in well sorted layers. Test boring information annotated on this map indicates that the alluvium and underlying sand deposits extend to depths ranging from 30 to 140 feet below the ground surface. In addition, this map indicates that artificial fill was observed above the alluvium at thicknesses ranging from five to 15 feet at several locations. (See Map 1 for visual reference of existing surface materials.)

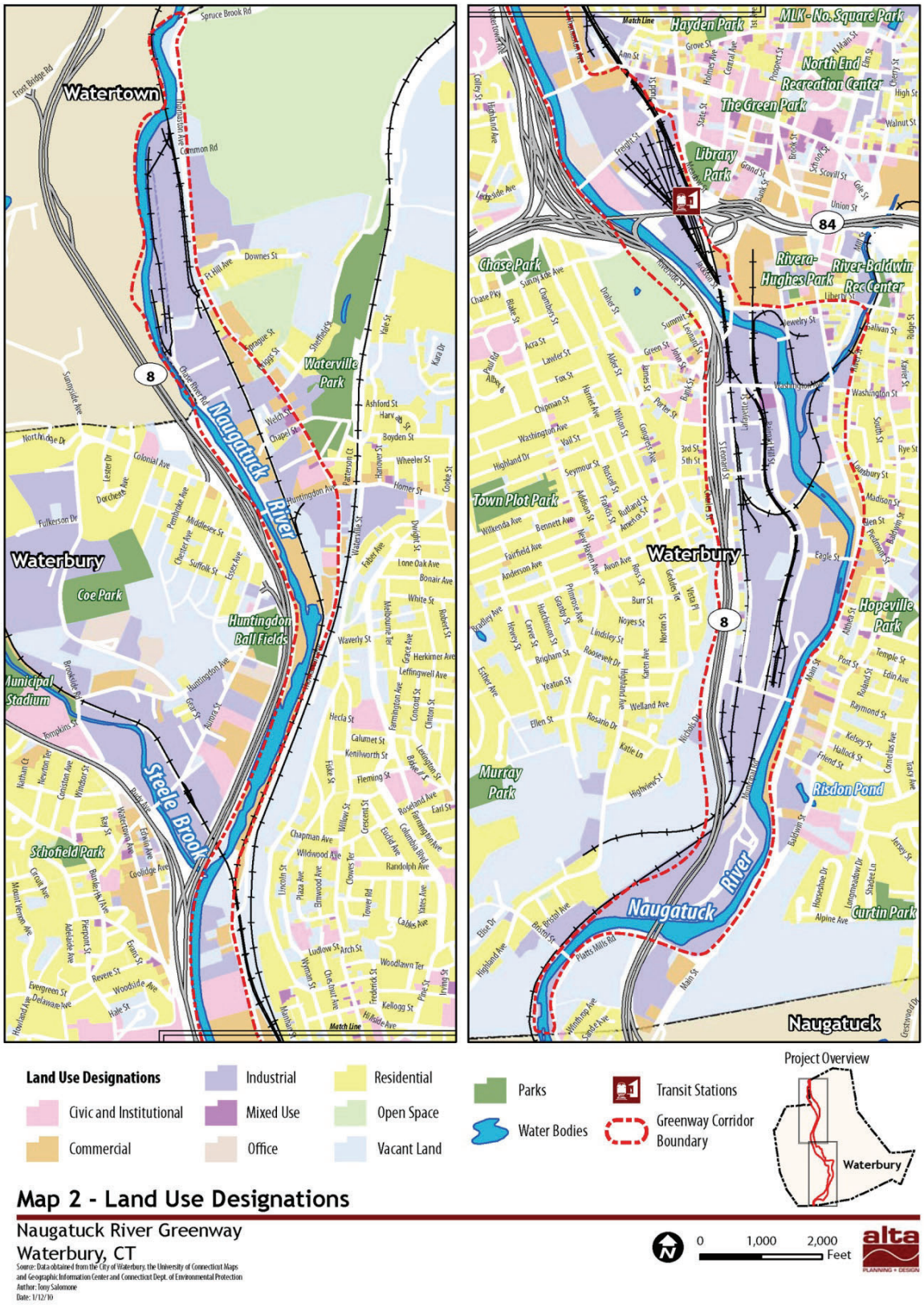
Surrounding Land Uses

While forest cover is the most significant land use along the Central Naugatuck River Valley outside of Waterbury, within city limits much of the area is developed with roadways, paved parking lots and buildings. These city surfaces combine to create a large swath of impervious surface that directs surface rainwater and run-off pollutants and detritus into the Naugatuck River. Some of this run-off has also helped to erode the Naugatuck's banks, thus bringing further polluted sediment into the river.

The specific land uses along the river corridor range from residential to commercial to industrial, with the latter being the most prominent. Single-family homes and small apartment buildings lay along a short stretch of Platts Mills Road and intermittently along South Main Street between South Leonard and Glen streets. Commercial properties, which include retail, restaurant and office uses, lay within the corridor along parts of South Main Street, at the Bank Street Bridge, on parcels of land wedged between the river and Thomaston Avenue north of West Main and at the Huntingdon Bridge. Industrial uses—both active and abandoned—front both sides of the river nearly everywhere else, with the highest concentrations between South Leonard and Bank streets and along Chase River Road north of the Huntingdon Street Bridge. Many of the vacant industrial uses were home to brass and other metal working industries that have left significant levels of pollution on site.

The City's wastewater treatment plant also occupies a large swath of land on the west bank of the river north of Platts Mills Road. Some of the land adjacent to the river remains in a natural state, disturbed only by the presence of rail lines and roadways such as Route 8. This condition is most prevalent along the east bank, along portions of Platts Mills Road and along a half-mile long stretch of the west bank, north of Huntingdon Avenue. (See map on following page.)

Map 2. Land Use Designations



Erosion and Drainage

During construction, temporary erosion and sediment control measures will be required to prevent discharge of soil- or sediment-laden stormwater to receiving water bodies (e.g., the Naugatuck River). These control measures are required of most construction projects and are well understood by the construction industry. They therefore do not represent an impediment to the project.

Permanent erosion control measures may be required where trail development requires disturbance of stream embankment or construction of steep embankments. Examples include riprap revetment, turf reinforcement matting, reverse slope benches, etc.

Since the majority of the trail will be developed at or close to existing grade, we do not anticipate disturbance of existing drainage pipes.

Traffic and Roadway Capacity

Within the study corridor, certain sections of the greenway will be sited within the rights-of-way of existing roadways, in locations where conditions do not allow the trail to be located within its own easement along the river due to identified constraints. In many cases, portions of the trail will be shared-use paths built adjacent to the roadway, separated by a crash barrier or a tree-lined buffer, depending on the availability of space. In a few discrete areas, the greenway or its spur trails will consist of striped bike lanes and/or existing sidewalks. The following roadways were considered in this review: Chase River Road, Thomaston Avenue, South Main Street and the bridges carrying Huntingdon Avenue, West Main Street, Freight Street, Bank Street, Washington Street, Eagle Street, and South Leonard Street.

Chase River Road

Chase River Road is a north-south oriented roadway that runs parallel to the Naugatuck River. The road begins at Huntingdon Avenue to the south and connects to Commons Court approximately three-quarters of a mile to the north. Chase River Road serves several large industrial and commercial office facilities and, as a result, has significant truck traffic. The volume of truck and automobile traffic on the roadway is limited during the midday hours and weekends.

Chase River Road north of Huntingdon Avenue

Chase River Road provides a single, wide travel lane in each direction, with an overall width of 36 to 38 feet. Because of truck traffic, it will be necessary in this area to provide separation between vehicular and greenway traffic. Sufficient width exists within the right of way to maintain 12-foot travel lanes, a narrow shoulder and a 10-foot-wide trail separated from the traffic lanes by a crash barrier.

Thomaston Avenue

Thomaston Avenue, a north-south arterial roadway, begins at the Thomaston Town Line to the north and terminates at West Main Street to the south. The roadway is owned by the State of Connecticut, and is designated as State Route 847 (un-posted). The average daily traffic volume (ADT) on Thomaston Avenue varies between 8,500 vehicles per day south of Huntingdon Avenue to 13,500 vehicles per day near the southern terminus. In addition, numerous city bus routes run along Thomaston Avenue.

The segment of Thomaston Avenue beginning at Huntingdon Avenue and continuing south for approximately 2,000 feet is an extension of the Waterville business district and is built up with small retail establishments, resulting in numerous curb cuts and significant turning volumes. The roadway is approximately 36 feet wide through this segment; an on-street bikeway could be built here, but a separated shared-use path would be difficult to implement. Continuing south, the roadway narrows to 32 feet in width for approximately one mile. This segment is completely undeveloped, with only a few driveways over the one-mile-long segment, where vehicles frequently attain high speeds.

Thomaston Avenue north of West Main Street

The center segment of Thomaston Avenue is shown above. However, it would require widening of the shoulders or narrowing of the travel lanes roadway width to provide for shared bicycle lanes on both sides of the road. Right-of-way along this segment is limited due to the railroad tracks, which are located adjacent to the roadway on both sides.

The final 3,000 foot segment of Thomaston Avenue terminating at West Main Street is the busiest segment of roadway, with a large retail shopping plaza and multiple smaller retail developments located along both sides of the roadway. The width of Thomaston Avenue through this area varies between 38 and 40 feet.

Due to the higher volume and speeds of traffic on Thomaston Avenue in this section, it would be desirable to provide a fully separated shared-use path by means of a landscaped separation or crash-proof barriers. This configuration would be a challenging alternative through the business district, due to the high frequency of driveway intersections along both sides of the roadway, unless access management and driveway consolidations could be implemented to minimize conflicts between vehicles and bicycles. Although upgraded sidewalks and on-street bike lanes could potentially be a solution in this section, it is not an ideal route for a greenway trail.

Because of all of the constraints mentioned above, it is not recommended for the greenway trail to run immediately adjacent to Thomaston Avenue. Between Huntingdon Avenue south to West Main Street, the greenway trail will run along the river on both east and west banks.

South Main Street

South Main Street, a north-south oriented arterial roadway, begins at Bank Street to the north and terminates at the Naugatuck borough line to the south. The road is owned by the State of Connecticut and is a continuation of the un-posted State Route 847. From north to south, the ADT of South Main Street varies between 15,200 vehicles per day and 6,900 vehicles per day along its length.

The segment of South Main Street between Washington Avenue and Verzier Street is approximately 38 to 40 feet wide, providing a single travel lane in each direction, plus parking lanes on both sides of the road. This segment is developed with a dense mix of residential and commercial uses.

South Main Street south of Washington Street

South Main Street at Baldwin Street

South of Verzier Street, South Main Street widens to 52 feet in width, providing two southbound lanes and one northbound lane to Leonard Street. South of Leonard Street, the roadway varies between 56 and 60 feet in width, providing two lanes in each direction. These segments of South Main Street are more sparsely developed with a mix of commercial and industrial developments, several of which are

abandoned. Truck volumes are heavier through this segment due to industrial developments on both sides of the Naugatuck River.

Due to the volume and speeds of traffic on South Main Street, it would be desirable to provide a fully separated shared-use path. Unfortunately, this would probably not be feasible on the segment north of Verzier Street, due to the dense pattern of development, heavy use of parking and limited right-of-way.

The wide segment of South Main Street south of Eagle Street is proposed for the installation of a shared-use path with a landscaped buffer separation from the roadway. It is potentially feasible to remove one traffic lane on the segment between Platts Mills Road and Verzier Street, as the volumes do not appear to warrant the existing four-lane roadway in this section. Parking along the river side of South Main will need to be restricted between Verzier and Eagle Street where South Main becomes a two-lane roadway. Access management techniques can be developed for areas where existing driveways cross the proposed trail alignment. Initial discussions were held with ConnDOT traffic department officials and, at this point, the agency has not prohibited concept-level consideration of the use of this portion of the South Main Street ROW. Additional analysis will be required during the design-development and final engineering phases of the greenway in this section.

If, ultimately, ConnDOT does not allow the reduction of a travel lane, the South Main corridor is still the preferred alignment. In this scenario, options for the Greenway include a design that features a narrower landscaped buffer with guard rail instead of trees, and/or utilizing the varying-width parcels of land closer to the river either within the ConnDOT right-of-way or within an easement on private property.

Natural Features

Because much of the land on either side of the Naugatuck River is well developed with roadways, pavement and industrial/ commercial land uses, the more natural curves and bends of the tree-lined waterway offer a spectacular contrast to the surrounding built environment. While multiple shades of gray and the red brick color of an industrial world lie adjacent, the river offers shades of green and blue, with touches of red and orange colors in the fall. The trees and vegetation—much non-native—are quite attractive for most of the seven-mile reach of the river and should become a major attraction for the City of Waterbury. Though discontinuous in some areas, the tree stands that exist along both banks of the river are “young, diverse and, for the most part, in

The Naugatuck River’s corridor of green and blue winds its way below the I-84/Route 8 interchange.

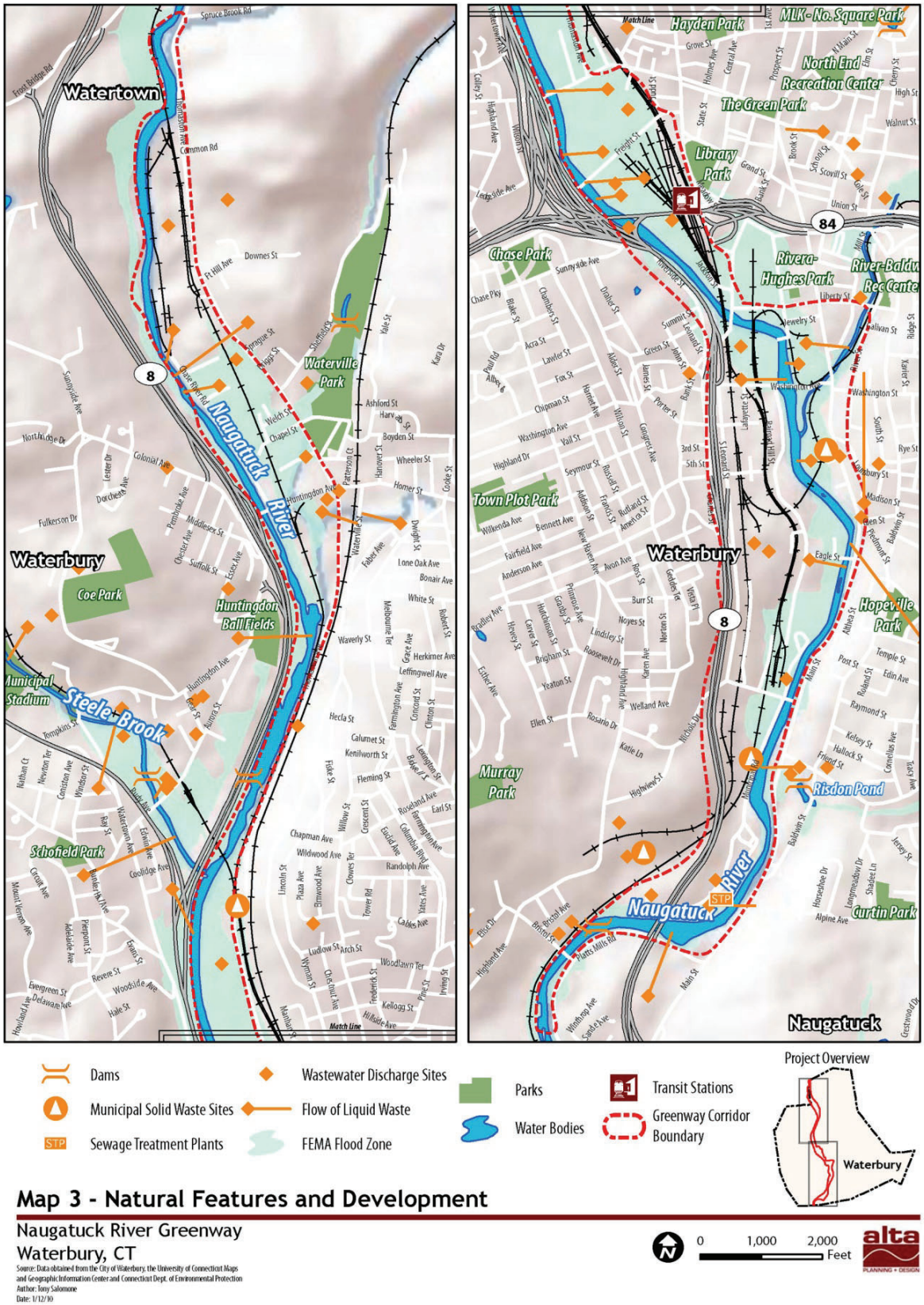
reasonably good health.[2]" The Environmental Review Team's (ERT) 2006 Report offers a note of caution that when developing the future trail, care should be taken to avoid increasing the discontinuity of the tree canopy, for to do so could open the door for further propagation of invasive species.

The corridor of green and blue through the City is further enhanced in areas where the river has been left to widen out at the confluence of streams and brooks and in flood plains. Here, wetland areas help support non-native vegetation, fish species and some limited wildlife habitat areas. Habitat areas have also improved recently with the removal of a handful of dams along the Naugatuck in the past 10-15 years. Despite the dam removals, along with recent improvements to water quality, fish population surveys confirm that fish populations remain low, due primarily to the lack of a contiguous habitat and fragmentation of once-vegetated riparian areas.

The ERT Report advocates for a greenway trail along the Naugatuck, not only for recreational and transportation purposes, but also for environmental reasons as well. It argues that if designed with a minimal disruption to stream banks and other areas of habitat, the future greenway's pedestrian access to the river will encourage greater understanding of the environmental condition of the river, especially if interpretive signs and other educational material are provided at trail heads and rest areas. Through these means, an increased sense of stewardship will be instilled in the community and, with time, additional enhancements such as restoration of riparian and in-stream habitat could be realized.

[2] Naugatuck River Greenway King's Mark Environmental Review Team Report, June 2006, p. 66

Map 3. Natural Features and Development



Cultural, Historic and Recreational Resources

Being an older city of over 100,000 people, a number of parks, schools and recreation areas in Waterbury border the Naugatuck River corridor. (See Map 4 on following page.) According to GIS information provided by the City, no significant historic archaeological sites exist. However, the Washington-Rochambeau Revolutionary Route did pass through Waterbury from Hartford, eventually ending in Yorktown, Virginia. There are a number of historic architectural landmarks flanking or relatively close to the river, including the Waterbury train station and clock tower, the buildings surrounding the City Green and Waterbury City Hall. In addition, the trail presents a unique opportunity to integrate heritage and cultural elements ranging from environmental interpretation of the river's restoration to telling the story of the city's industrial past, present and future.

Structures in the Potential Routes

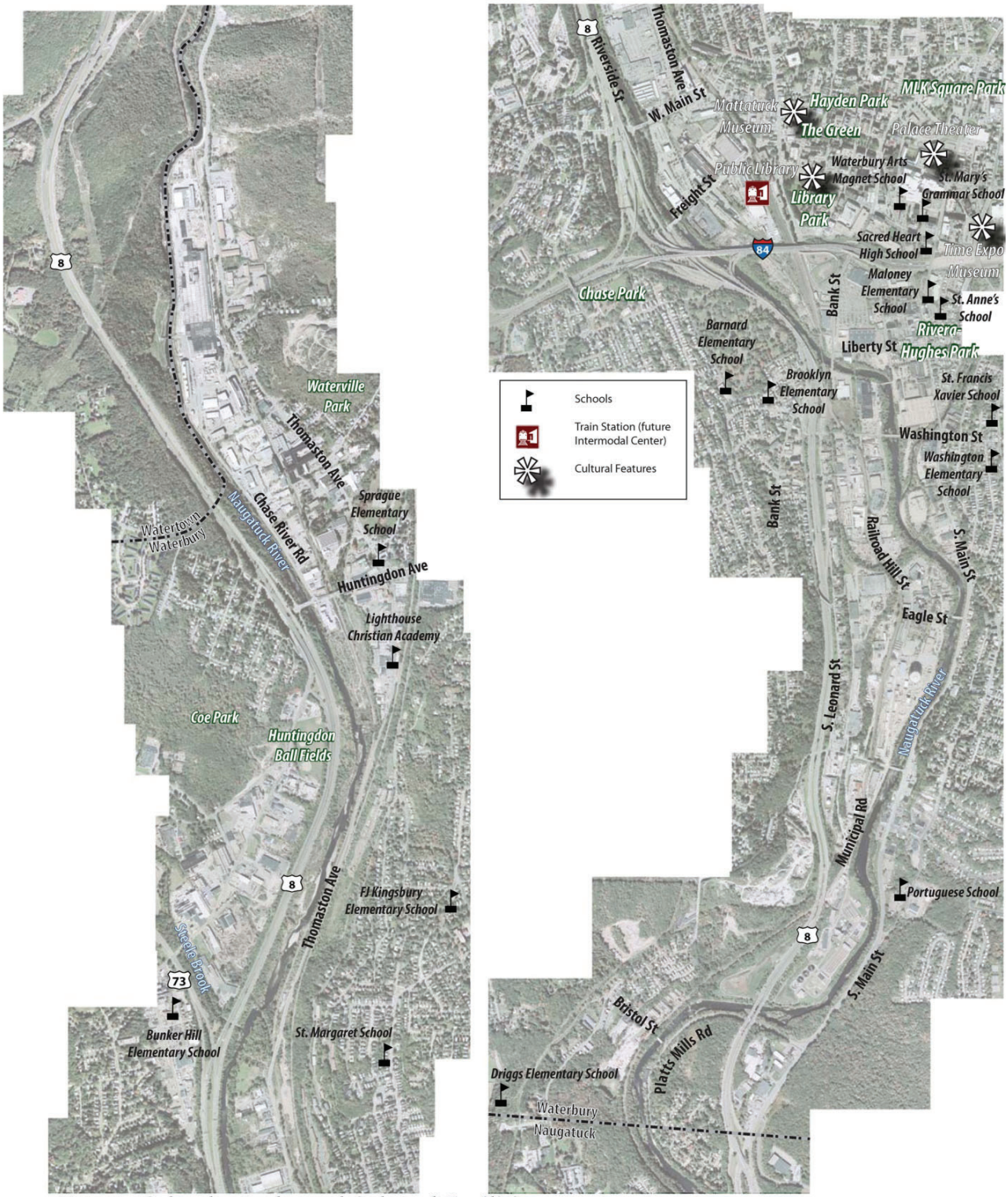
Seven vehicle bridges cross the Naugatuck River, not including I-84 and the on/off ramps that connect it to Route 8. While all include sidewalks of varying width and condition, none currently have specifically-designed provisions for cyclists (signed route, bike lanes, etc.). From north to south the bridges include the following:

Huntingdon Avenue bridge looking west to Route 8

Huntingdon Avenue

The Huntingdon Avenue Bridge provides four lanes, two in each direction, with a total of 44 feet of pavement width, plus a five-foot wide sidewalk on the north side and a three-foot wide sidewalk on the south side. Traffic volumes are heavy.

Map 4. Schools, Parks and Cultural Facilities



Map 4 - Schools, Parks and Cultural Facilities

Naugatuck River Greenway Routing and Feasibility Study
Waterbury, CT

Source: Aerial photos obtained via Google Earth Pro and school and park locations obtained via the University of Connecticut Maps and Geographic Information Center
Author: Tony Salomone
Date: 1/12/10

0 1,000 2,000 Feet

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West Main Street

The West Main Street bridge provides four lanes, with a total of 44 feet of pavement width, plus eight-foot wide sidewalks on both sides of the roadway. Traffic volumes are heavy, with an ADT of 26,400 vehicles per day.

Freight Street

The Freight Street bridge provides four lanes, with a total of 44 feet of pavement width, plus eight-foot wide sidewalks on both sides of the roadway. The structure is designated as the Pearl Harbor Memorial Bridge, featuring brick sidewalks and built-in benches with plaques honoring American veterans. Traffic volumes on this segment of roadway appeared light during a field visit. Additional research, including traffic count collection and analysis, would be necessary in order to determine the feasibility of any changes to the lane configuration.

Bank Street

The Bank Street bridge provides two lanes, with a total of 36 feet of pavement width, plus 6.5-foot wide sidewalks on both sides. It may be feasible to widen the sidewalk on one side of the bridge and convert it to a shared-use path. Traffic volume over the bridge appears to be light.

Washington Street

The Washington Street bridge provides two lanes, with a total of 28 feet of pavement width, plus 4.5-foot wide sidewalks on both sides. The approach to the bridge from South Main Street crosses a second very narrow bridge over the existing railroad tracks.

Washington Street bridge looking east

Eagle Street

The Eagle Street bridge provides two lanes, with a total of 28 feet of pavement width, plus 4.5-foot wide sidewalks on both sides. Traffic volume on the bridge is light. Several industrial facilities, however, use the bridge as their primary access point, resulting in high volumes of truck traffic.

South Leonard Street

The South Leonard Street bridge provides two lanes, with a total of 30 feet of pavement width, plus 4.5-foot wide sidewalks on both sides. Traffic volume on the bridge is light; however, several industrial facilities use the bridge as their primary access point, resulting in a high percentage of truck volumes.

In addition to the roadway bridges, a table of railroad bridges and other structures is included on page 23 of this study.

Infrastructure and Utilities

Utility Assessment

A preliminary utility assessment was performed within the corridor of the greenway. Utilities on Thomaston Avenue, Chase River Road, Huntingdon Avenue, West Main Street, South Main Street and other adjacent streets were observed. Utilities on bridges over the Naugatuck River including Huntingdon Avenue, West Main Street, Freight Street, Bank Street, Washington Street, Eagle Street and South Leonard Street were observed. Utilities were also field investigated on those public and private properties within the corridor (away from roadways) where the greenway could potentially be located.

Utility poles along Thomaston Avenue from Boyden Street

Connecticut Light & Power Company provides electricity in Waterbury, while several other carriers provide telecommunications. There are typical above- and below-ground utilities on every roadway. Field observations did not observe any unusual utility situations. Relocating existing utilities is usually an expensive proposition. It is typically best to avoid existing utilities wherever possible; that is the case within this corridor.

Traffic signal heads at the Huntingdon Avenue bridge

Utility Poles

Utilities within the corridor are typical for an urban/suburban setting. Roadside utility poles are located on many of the roadways. Pole location range from six inches to several feet away from the edge of the roadway. Most of these poles support primary and secondary electrical lines, telephone and cable television lines. Many poles support step-down electrical transformers and street lights. Some poles support digital network communications boxes attached at the pedestrian level.

Most of these poles will be expensive to relocate because of the numerous utility lines they carry. It is not unusual as part of a relocation for slack to be cut-in or -out of lines, thus adding to the cost. Experience from similar projects suggests that the cost of relocating utility poles within the corridor could range between $3,000 and $15,000 per pole. Connecticut General Statutes, Title 7, Section 148 gives municipalities the authority to “regulate the laying, location and maintenance of gas pipes, water pipes, drains, sewers, poles, wires, conduits and other structures in the streets and public places of the municipality…” Municipalities have used this authority to direct the relocation of utility installations at the utility owner’s expense. Therefore, these project costs may be reduced or eliminated if the required

relocations can be planned into the utility owner's construction schedule. Easements from adjacent property owners, including aerial encroachment easements, might be necessary should the poles need to be moved a significant distance from their current locations. Placing overhead utilities underground is extremely expensive and usually cost prohibitive for a greenway project.

Signalized Intersections

Numerous signalized roadway intersections exist within the corridor. Traffic signal appurtenances include traffic-signal span-support poles, pedestrian signals, pedestrian push-button pedestals and traffic controller boxes. Some of these signals are owned and maintained by the Connecticut Department of Transportation while others are owned and maintained by the City of Waterbury. Most of the appurtenances are located where they would probably not conflict with a greenway. It should be noted that not all the signalized intersections within the corridor have exclusive pedestrian phases, which allow pedestrians to cross the street in a protected manner. Exclusive pedestrian phases would likely be required at all intersections where the greenway is located. Upgrades to the signal hardware and controller would likely be required at intersections that do not currently have exclusive pedestrian phases.

Costs for these upgrades will vary depending upon the type of existing signal equipment. Where new hardware is required, the cost of the upgrades can be on the order of $50,000 to $100,000 per intersection.

Bridges

Utilities on the bridges are minimal and would not likely pose an obstruction to the greenway. Most of the utilities that cross the bridges do so by an overhead clear span, meaning there are no utility supports on the bridge. It is possible that some utilities are suspended below the bridge decks. Clear-span and suspended utilities typically do not interfere with greenway location.

Utilities on Other Properties

Utilities within public and private properties not adjacent to roadways are minimal and would not likely pose an obstruction to the greenway. Where utilities do exist, they should be avoided if possible, unless there is an advantage to shared-use of the corridor, such as a fiber optic or water line that could be co-located under the proposed trail. In addition to negotiating with the utility companies, the property owner(s) would also need to be consulted.

Utility poles on private property

Links/Connections

Connections to the river itself, and even to an adjacent greenway, will be challenging due to the lack of existing publicly-owned land along the river. Historically, the land uses developed on the private property fronting the river have not been conducive to public access and recreation. The industrial, manufacturing and commercial properties are frequently built right to the river's edge and include infrequent rights-of-way that follow the river. In some places, the distance between publicly-accessible bridges is more than one mile, especially north of West Main Street and south of Leonard Street. Additionally, connections to the river are cut off due to the immediate presence of Route 8, which creates a formidable barrier from the west-side neighborhoods to the river. Consequentially, the only places where direct greenway access exists below Route 8 from the west include (from north to south): Huntingdon Avenue from the Fairmount area, West Main Street from Rowland Park, Bank Street, Washington Avenue, Leonard Street/Nichols Drive and, finally, Platts Mills Road, which connects to the Bristol Street bridge and to the west bank.

One enhanced connection to the west is possible if a spur trail to Municipal Stadium Park is considered alongside Steele Brook. This will connect with a trail currently being planned along Steele Brook in nearby Watertown.

Despite busy roads, such as South Main Street, and a handful of large industrial properties that lay abandoned, connections to neighborhoods on the east side are generally much stronger than to the west. This is not the case, however, at the north end of the corridor, where active rail lines and steep topography along Thomaston Avenue prevent links to communities on the east. The exception is Huntingdon Avenue/Homer Street which connects to the Waterville area and neighborhoods near Lakewood Park. An enhanced connection to Waterville Park is possible if a spur trail along the tributary that runs underneath Huntingdon Avenue is considered. South of West Main Street, connections to downtown and the east-side neighborhoods are far more frequent, though not without their own prevailing set of constraints. West Main, Freight and Bank streets all connect to downtown, though all are in need of improvements for cyclists and pedestrians. Both Washington Avenue and Piedmont Street offer direct links up the hill to Washington Park, Pritchard's Pond and the communities that surround them. South of Piedmont Street and the nearby Eagle Street Bridge, connections to the east are constrained by fast-moving traffic on South Main Street, the dearth of cross streets and crosswalks, as well as by the adjacent river. By far, the least encumbered access to the greenway will be for those living within the small grid of streets off of Platts Mills Road in the Borough of Naugatuck.

Impacts to Adjacent Land Uses

The greenway trail's impacts to adjacent land uses are still unknown at this point and will be entirely dependent upon the alignment that is ultimately approved by the City and subsequently makes its way into the final design and engineering stage. Impacts may include, but are not limited to, a trail easement through a given property, a small parking lot and kiosk at a trail head location, or the potential redevelopment of a vacant site. Financial impacts in the aggregate, however, are likely to be positive. Indeed, many examples exist throughout the country of adjacent property values rising after the completion of a greenway trail.

Bridges, Intersections and Access Points

Because river frontage is dominated by private property, some of the best opportunities for the public to actually see the river are along an adjacent road or from one of the bridges that cross the river. There are 15 bridges that cross the Naugatuck River within city limits. These include four railroad bridges, one private bridge and the I-84 overpass. The map below and table on the following page illustrate the bridge locations as well as the key elements of each bridge, such as the number of traffic lanes or the width of the sidewalks.

Map 5. Bridge Locations

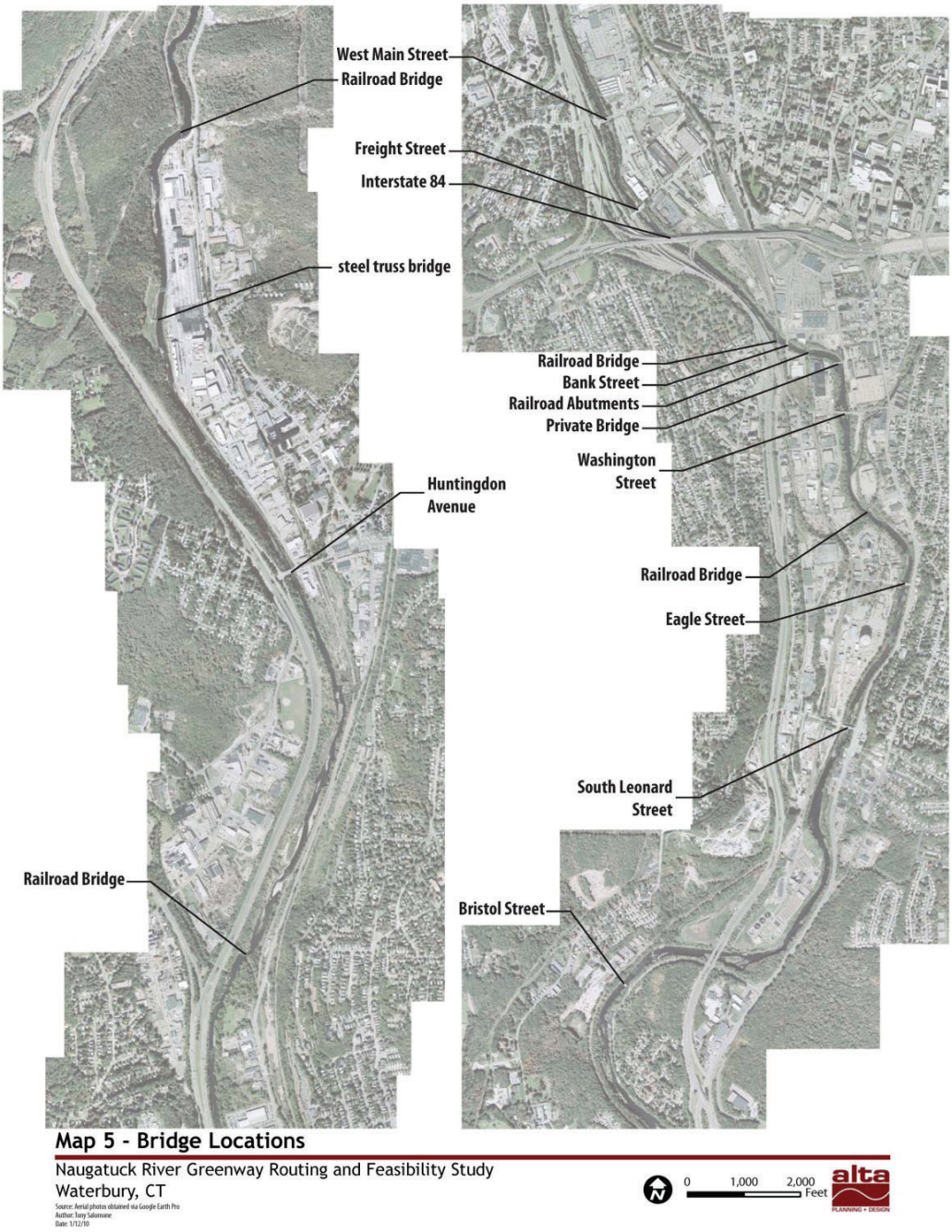


Table 1. Existing Bridge Inventory Matrix

Bridge Name or Location	Status	Ownership	Bridge Width	Road Width	Lanes/ Tracks	Sidewalk Width	Sidewalk Location	ADT*	Utility Conflicts	Structural Condition	Comments
Railroad	Active	TBD	≈ 15’	≈ 15’	1	N/A	N/A	N/A	No	Fair	Used only by Railroad Museum of New England
Steel Truss Bridge	Inactive	TBD	≈ 16’	≈ 16’	2	N/A	N/A	0	No	Fair	Inactive trestle located within Waterbury Industrial Commons
Huntingdon Avenue	Active	City	52’	44’	4	5’/3’	North & South	Heavy	No	Good	Abutments extend beyond the bridge deck on the downriver side
Railroad	Inactive	TBD	≈ 15’	≈ 15’	1	N/A	N/A	N/A	No	Fair	Appears to be abandoned or inactive
West Main Street	Active	State	60’	44’	4	8	North & South	26,400	No	Good	
Freight Street	Active	City	60’	44’	4	8	North & South	Light	No	Good	
I-84	Active	State	60’	60’	6	N/A	N/A	93,600	No	Good	
Railroad	Active	TBD	≈ 25’	≈ 25’	2	N/A	N/A	N/A	No	Fair	
Bank Street	Active	City	49’	36’	2	6.5’	East & West	Light	No	Good	
Railroad	Removed	TBD	N/A	N/A	N/A	N/A	N/A	N/A	No	Poor	Only abutments and piers remain; originally carried two tracks
Private Bridge	Active	TBD	≈ 22’	≈ 20’	2	N/A	N/A	0	Yes	Fair	Appears to be for limited private use
Washington Street	Active	City	37’	28’	2	4.5’	North & South	Medium	Yes	Good	
Railroad	Inactive	TBD	≈ 10’	≈ 10’	1	N/A	N/A	N/A	No	Poor	Two piers holding up a single, suspended track segment, no abutments
Eagle Street	Active	City	37’	28’	2	4.5’	North & South	Light	No	Good	
South Leonard Street	Active	City	39’	30’	2	4.5’	North & South	Light	No	Good	
Bristol Street	Active	TBD	39’	27’	2	5’	North & South	Light	No	Good	

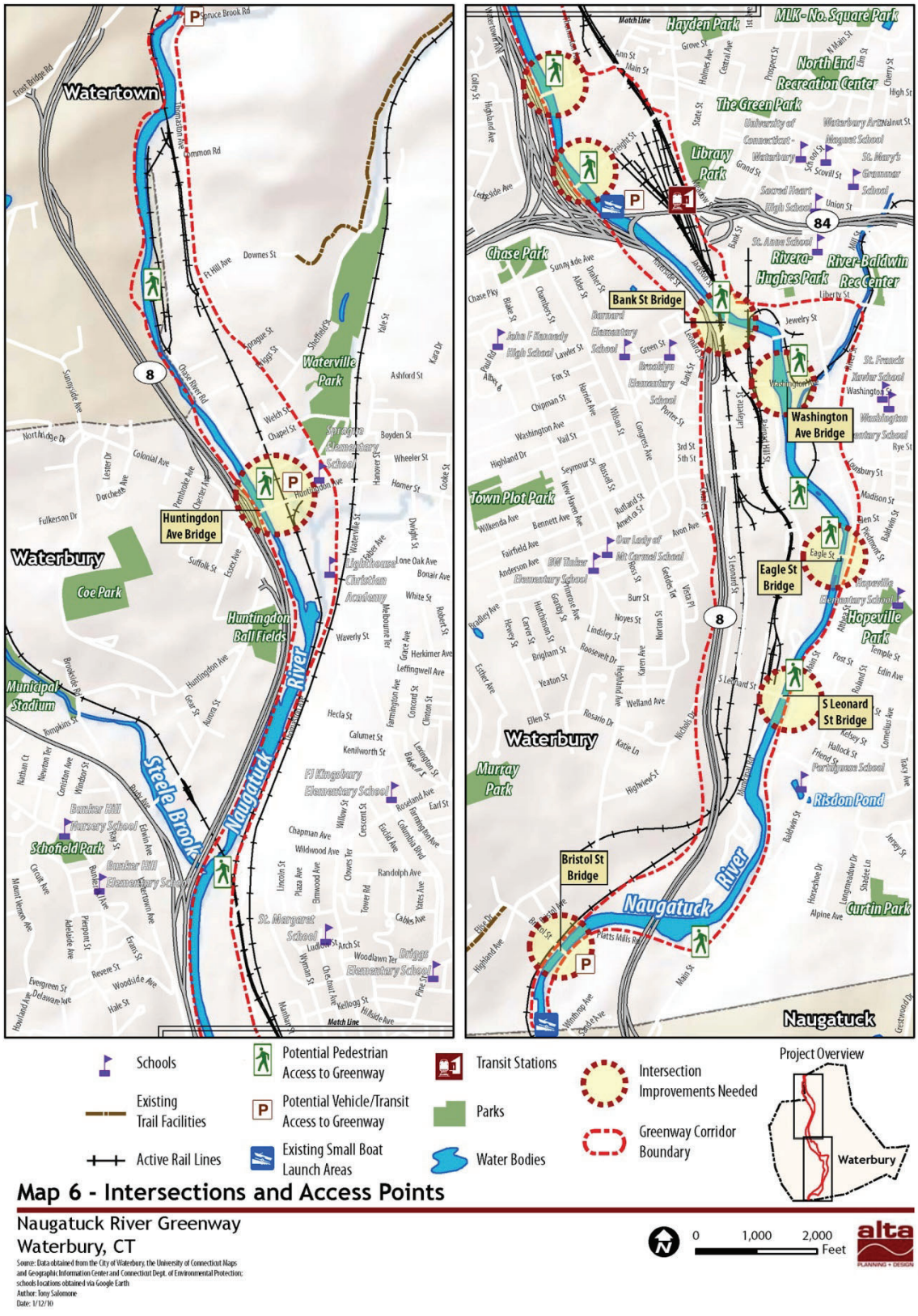
*Indicates Average Daily Traffic volume, where available from State of Connecticut Counts. Otherwise indicates field observations of traffic density.

On the following page, the Intersections and Access Points diagram illustrates:

- Potential locations for pedestrian access points to the river, i.e. trailheads;
- Potential locations for vehicle access points to the river, i.e. trailheads with accessory parking lots; and
- Areas where intersection improvements are needed to improve pedestrian and bike access to the adjacent bridges and/or the river itself.

The intersections and access points diagram is intended to draw attention to the need for improved connections on adjacent streets and intersections. These imposed connections increase opportunities for access to the future greenway at existing bridge locations and future trailheads. The figure depicts only potential locations for intersection improvements; others may exist and may be more desirable for future greenway users. A detailed evaluation of road network improvements has not been performed and costs for such improvements are not included in the construction cost estimates for the greenway.

Map 6. Intersections and Access Points



Environmental Issues

The development of a greenway trail along the Naugatuck River will bring significant environmental and social benefits to the community. While the development of a trail cannot, of course, return the river to a pristine ecological state, its presence will bring several benefits, including:

- Giving the community direct access to nature along the Naugatuck;
- Increasing multi-modal transportation options, thus reducing the region's dependence on fossil fuels for transportation;
- Providing opportunities for outdoor active recreation (such as walking and biking), leading to increased public health; and
- Improving riparian habitat with riverbank restoration work adjacent to the trail.

Despite these enhancements, a number of issues continue to degrade the environment. Land use within the greenway corridor boundary consists primarily of industrial and mixed commercial and residential. It is not uncommon for releases of oils or hazardous materials to be present on industrial or high risk commercial parcels such as gasoline stations, automobile or equipment repair facilities, dry cleaners, etc. In addition, based on the highly urbanized nature of the corridor and the likelihood of multiple generations of development, urban fill materials consisting of brick, block and asphalt within a soil and ash matrix are likely present through a majority of the corridor area. Artificial fill was identified as being present in the corridor area. Due to the presence of ash and asphalt within the urban fill, it is common to find pollutants such as heavy metals and polycyclic aromatic hydrocarbons (a class of toxic compounds commonly found in oil, coal and ash) and other hazardous compounds present within urban fill materials.

Environmental concerns will complicate the acquisition of parcels for greenway development. If parcels are purchased in support of the construction of the trail, consideration into the applicability of Connecticut's Property Transfer Law will need to be made, based on the industrial nature of the corridor area. The Property Transfer Law, described in Sections 22a-134a through 22a-134e of the Connecticut General Statutes, requires the disclosure of environmental conditions when certain real properties are transferred. The law applies only to those properties that are deemed to be "establishments" as defined under the law. As defined by the Transfer Act (Sections 22a-134a et seq. of the Connecticut General Statutes, as amended), an establishment is:

> *…any real property at which or any business operation from which (A) on or after November 19, 1980, there was generated, except as the result of remediation of polluted soil, groundwater or sediment, more than one hundred kilograms of hazardous waste in any one month, (B) hazardous waste generated at a different location by another person or municipality was recycled, reclaimed, reused, stored, handled, treated, transported or disposed of, (C) the process of dry cleaning was conducted on or after May 1, 1967, (D) furniture stripping was conducted on or after May 1, 1967, or (E) a vehicle body repair facility is or was located on or after May 1, 1967.*

If a parcel is determined to be an establishment, Connecticut Department of Environmental Protection (CTDEP) reporting and involvement may be required in order to transfer the property. CTDEP will require identification, delineation and remediation of releases of hazardous substances and hazardous waste at the parcel in accordance with Connecticut's Remediation Standard Regulations. These

requirements are typically met through the completion of Phase I, II and III Environmental Site Assessments.

The Property Transfer Law requirements described above are only applicable in cases where the greenway proponent acquires an "establishment" parcel through purchase, donation or condemnation. They are not relevant for non-establishment parcels or when an easement is acquired across a parcel. When an easement is acquired, competent legal counsel should be consulted to ensure that the City is not exposed to potential environmental liability. When a non-establishment parcel is to be acquired, it may be wise to perform a Phase I Environmental Site Assessment. This serves two purposes: it limits potential environmental liability by identifying previous sources of pollution at a site and it protects the City's eligibility for federal EPA funding should future cleanup be required.

Portions of the greenway traversing publicly owned lands that are not subject to the Property Transfer Law may nevertheless disturb polluted soil. Special consideration should be given to the following:

- **Soil disposal:** If excess soil is generated during the construction of the trail, it may require special handling and disposal due to the presence of pollutants. We recommend that the trail be designed in a manner to reduce the amount of excess soil generated during the project to mitigate the potential for excessive costs associated with polluted soil disposal. Where soil generation cannot be avoided, pre-construction sampling and contractor notification are recommended to avoid delays and cost over-runs.
- **Potential for exposure:** Although it's likely the greenway will be paved, thereby mitigating the potential for users to come into contact with pollutants directly beneath the trail, soil located along the shoulders of the trail could provide a potential exposure pathway. Surficial soil quality testing may reveal these conditions and permit the designer to incorporate mitigating measures (e.g., separation fabrics, clean fill, etc.).

Existing Conditions Summary and Conclusion

The Naugatuck River corridor through Waterbury offers significant potential for a greenway trail from one end of the city to the other. The river corridor provides the alignment and appropriate amount of space to afford an important recreational and transportation benefit for Waterbury. In the future, it is likely to connect with a larger, regional greenway trail that runs as far north as Torrington and as far south as Derby. Its existing conditions can be summarized as follows:

- The corridor runs from the city line at Thomaston to the north and Naugatuck to the south, a length of 7.1 miles, a perfect distance for bicyclists (and some runners!) to complete a full loop within an afternoon.
- Within a context that is primarily developed and paved, the corridor provides a swath of green running through the center of the city.
- The water quality and river habitat, while improved in the recent decades, remains polluted by storm water runoff. Additionally, fragmented habitat and invasive species are prevalent.
- The dearth of publicly-owned property along the river is a challenge but will not preclude the development of a greenway trail along a mix of this limited public land, easements along private property and within the rights-of-way of adjacent roadways and bridges.

References

CTDEP, 2003. Environmental Information for Connecticut, 2003 Edition. http://www.ct.gov/dep/cwp/view.asp?a=2698&q=322898

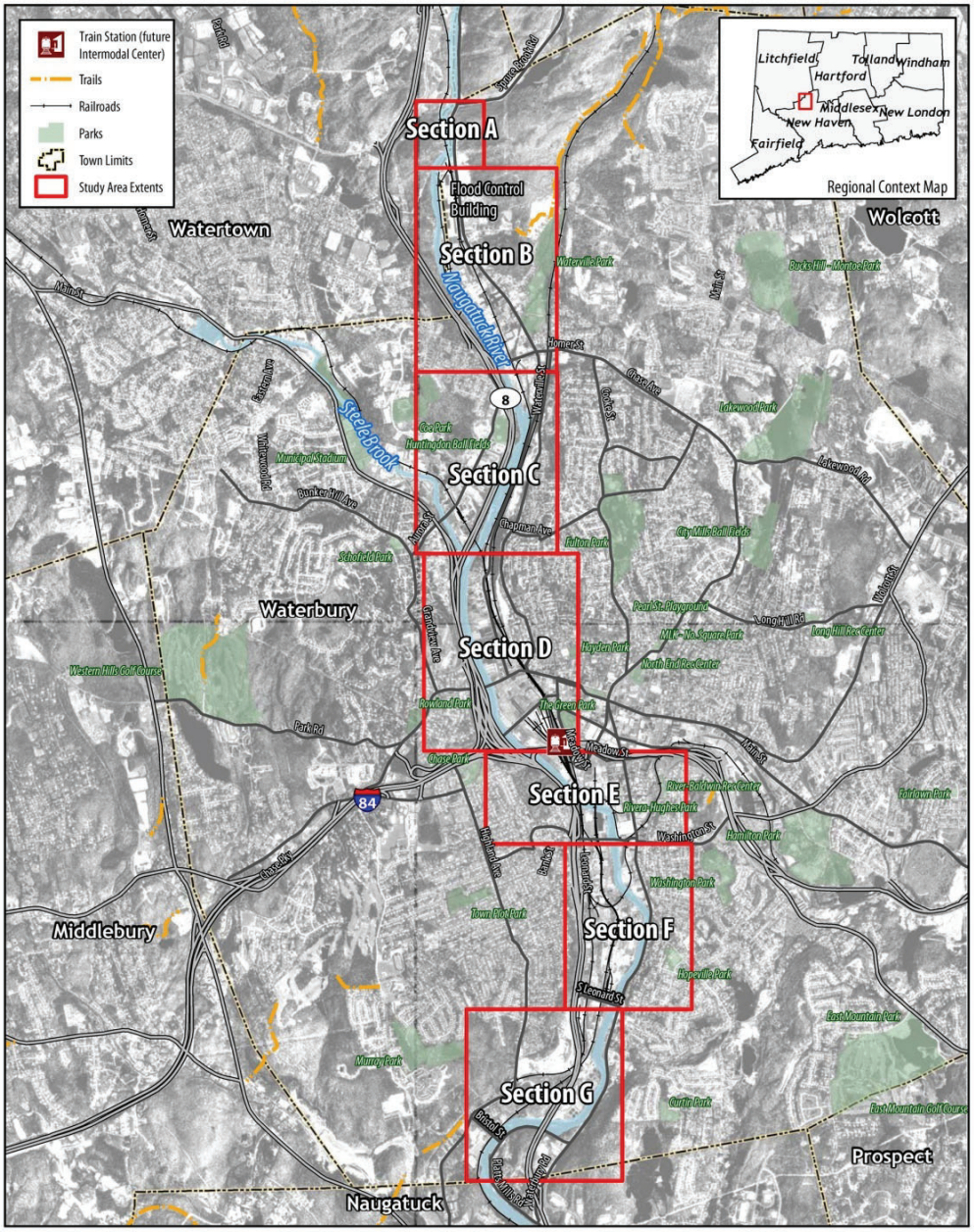
King's Mark Environmental Review Team Report, Naugatuck River Greenway, developed for the Mayor and Inland Wetlands and Watercourses Agency in Waterbury, June 2006.

Stone, J. R., Schafer, J. P., London, E. H. and Thompson, W. B., 1992. Surficial Materials Map of Connecticut; prepared in cooperation with CTDEP, Geological and Natural History Survey.

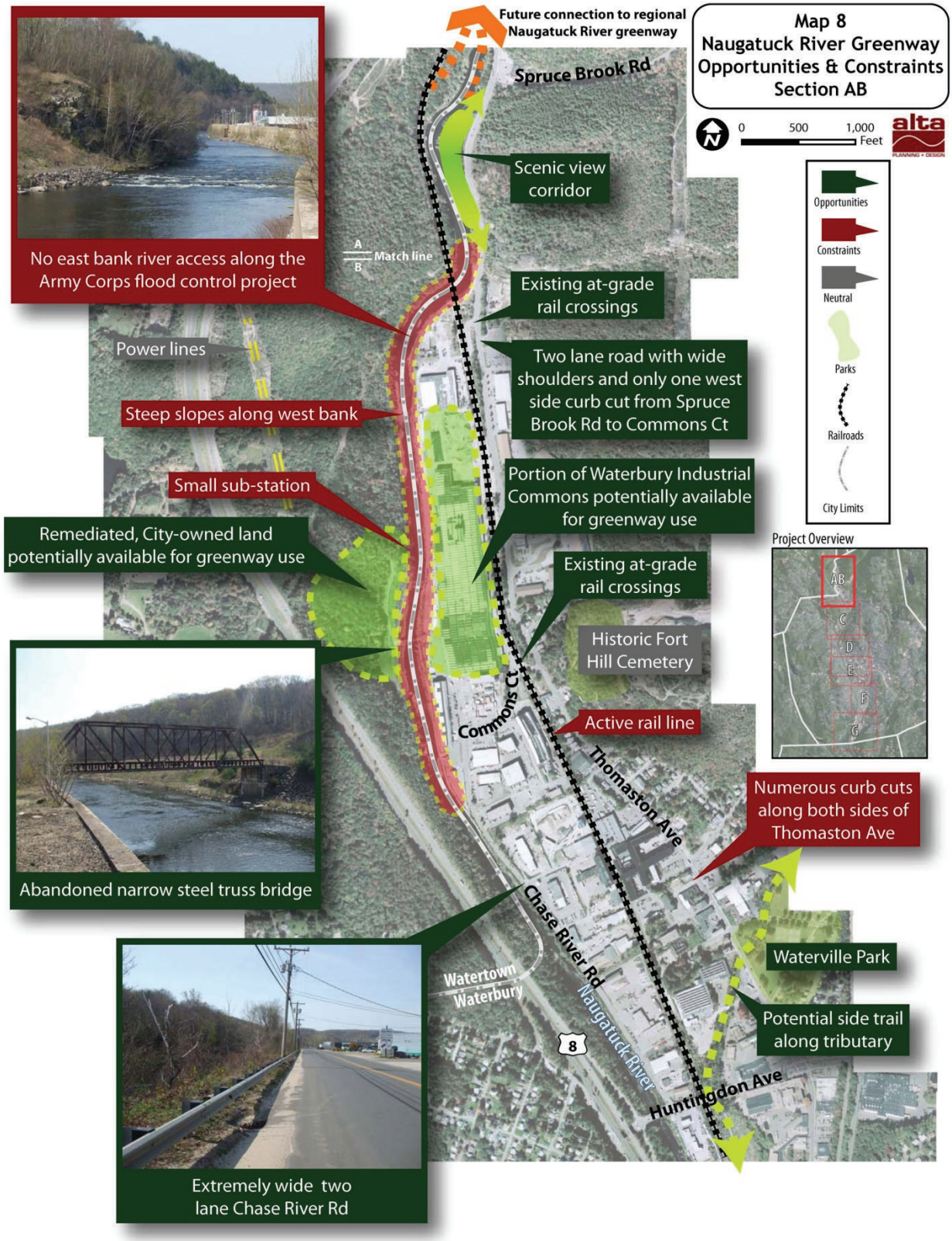
Opportunities and Constraints Diagrams

The following series of diagrams illustrates the numerous opportunities and constraints of the present conditions along the river with regards to the opportunity to develop a continuous greenway trail. The diagrams are developed along a series of sections that are approximately one mile long (see below).

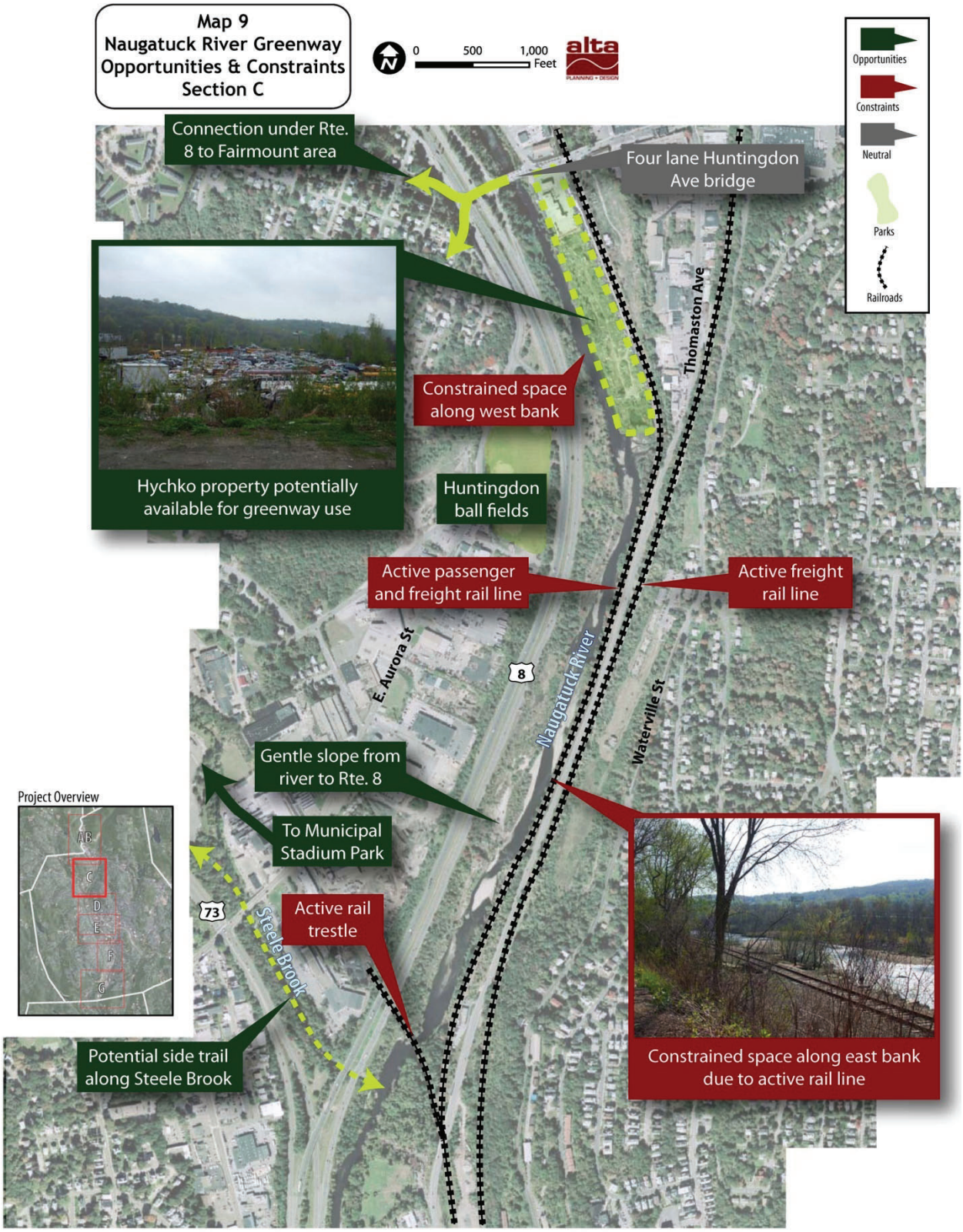
Map 7. Project Context



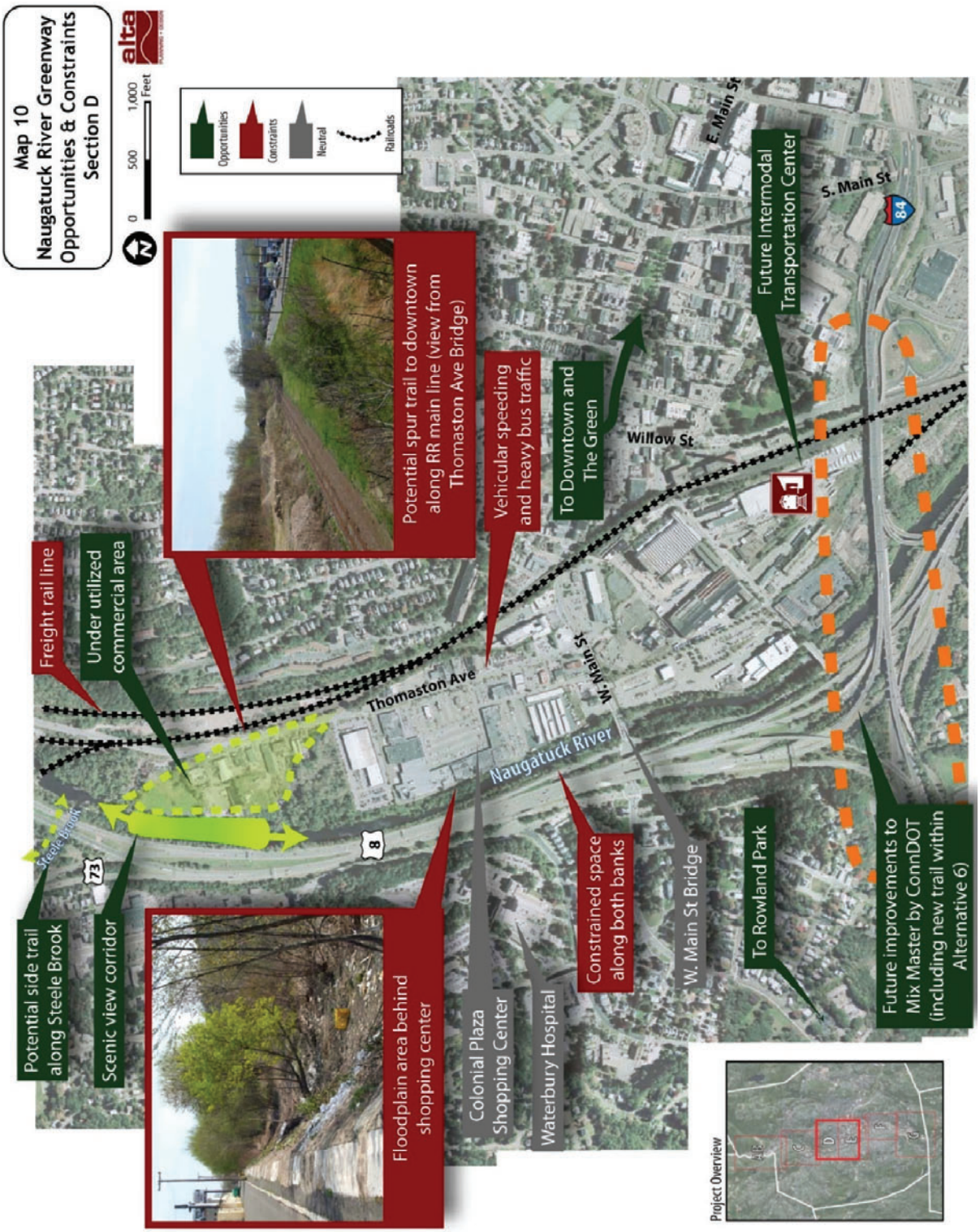
Map 8. Section AB



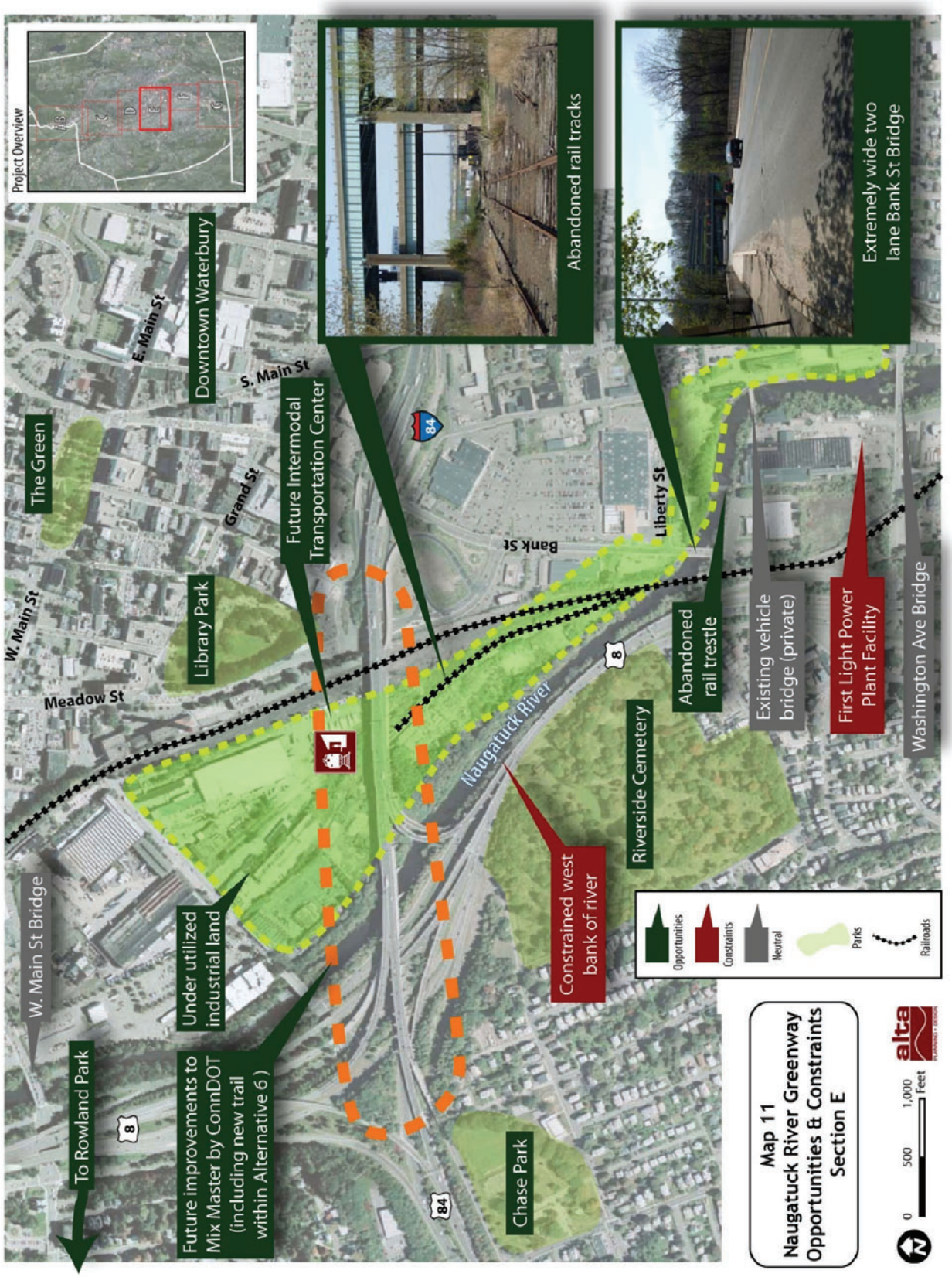
Map 9. Section C



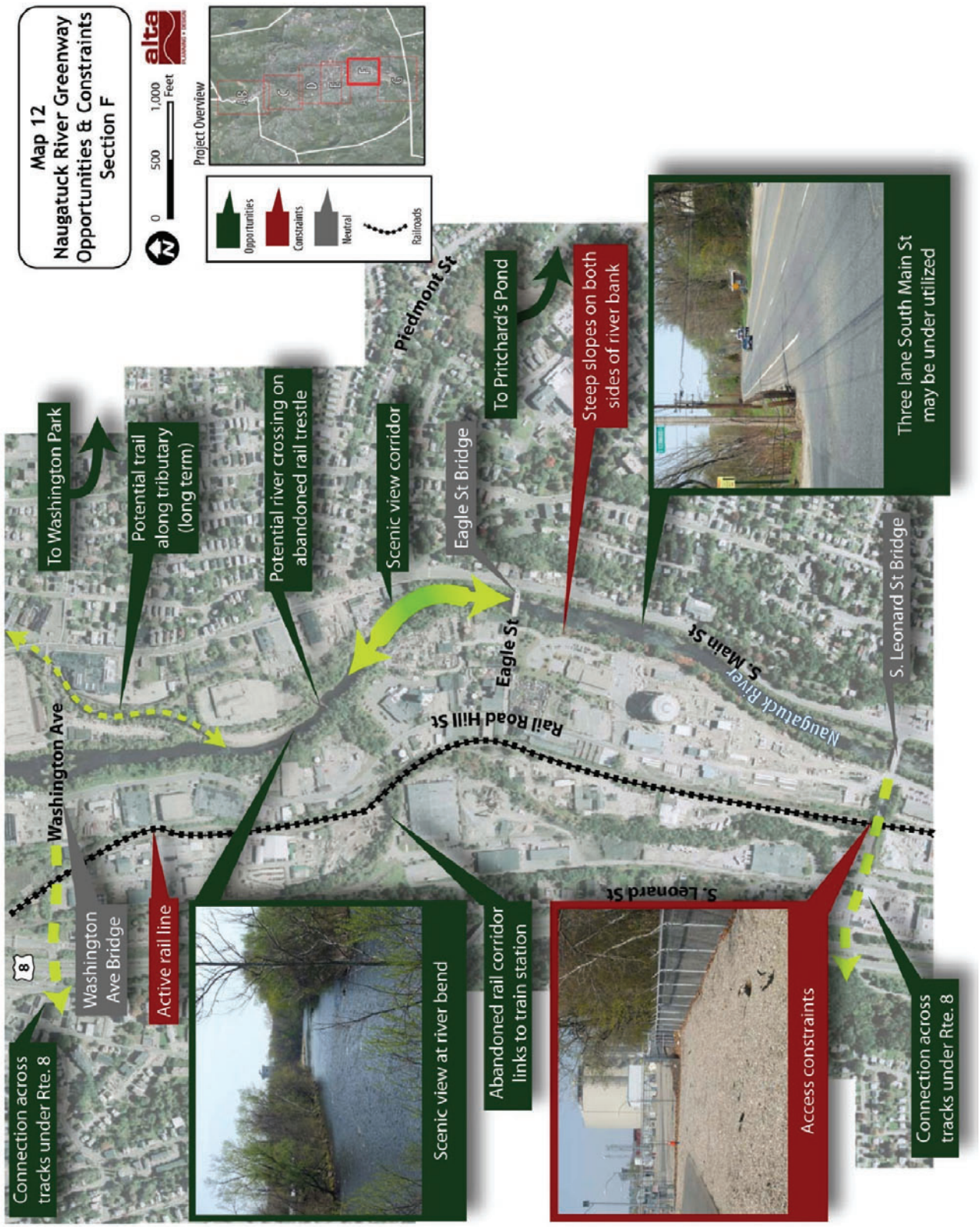
Map 10. Section D



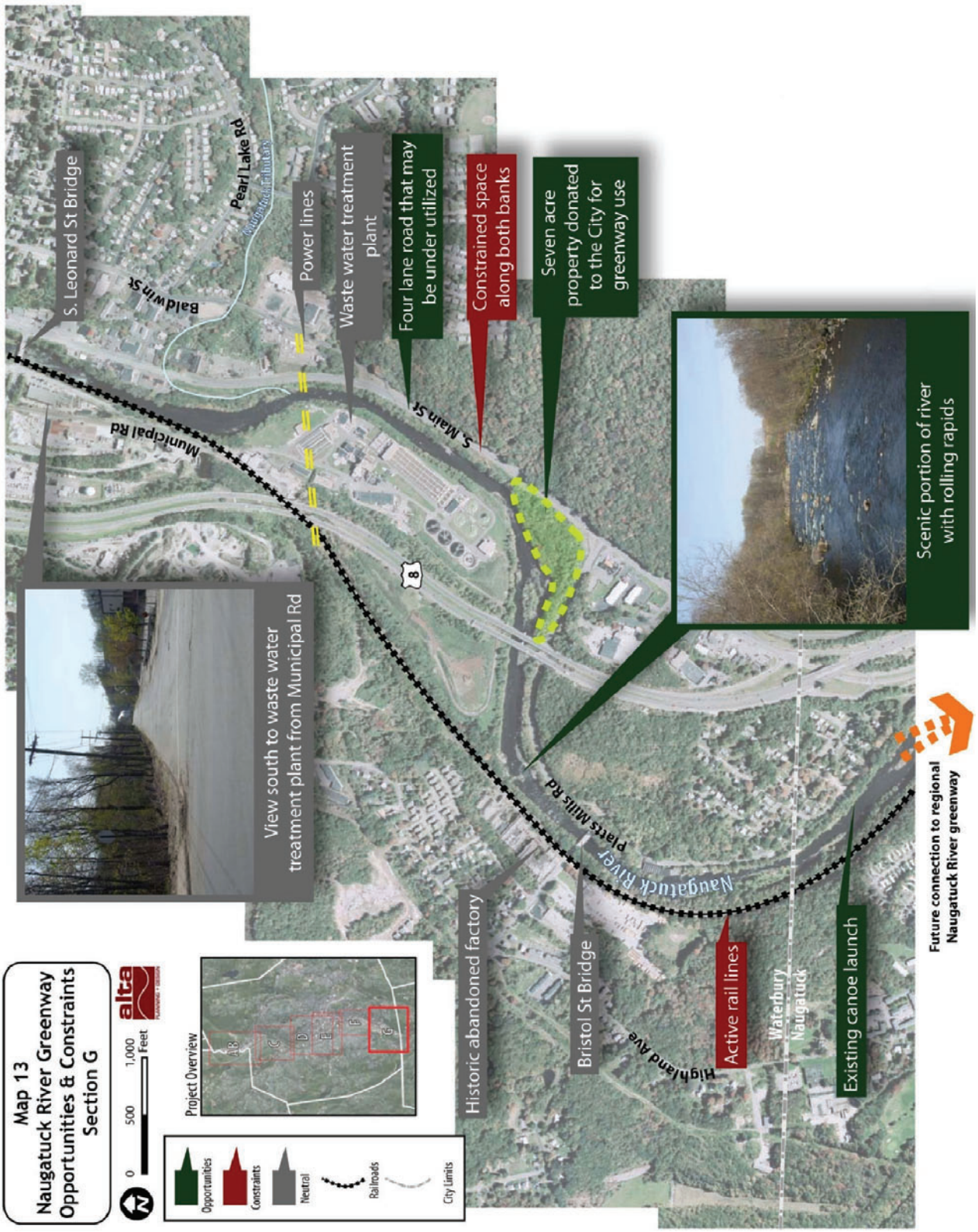
Map 11. Section E



Map 12. Section F



Map 13. Section G



III. Alternatives Analysis

The routing and feasibility study followed a methodology that included public involvement, Graphic Information Systems (GIS) data analysis, aerial photography, reviews of relevant planning documents and field observations to identify short-term and long-term alternatives for development of the Greenway. Alternatives were considered based on the analysis of opportunities and constraints. The goals and objectives outlined in the previous section guided the planning process. Public workshops were held at the data gathering stage and at the draft recommendations stage to ensure the inclusion of community input in the planning process. An online survey and project website were maintained throughout the study as well.

In order to evaluate potential alternatives, the Greenway Advisory Committee (GAC) developed criteria to identify potential alignments for inclusion in the draft greenway plan. The following scoring system for alternative evaluation helped the project team to understand the relative value of potential alternatives so that trail solutions could be developed that were appropriate to local issues. The methodology was considered a 'living' document and was used as a flexible guideline for identifying the proposed greenway route.

The selection criteria were a tool for identifying potential alternatives for the Waterbury Naugatuck River Greenway. The following steps were part of the planning process:

1. Work with the GAC to develop the selection criteria matrix (summarized in the table below)
2. Utilize the matrix during field work and corridor inventory tasks to collect appropriate data
3. Evaluate potential alternatives based on the criteria for inclusion in the greenway plan

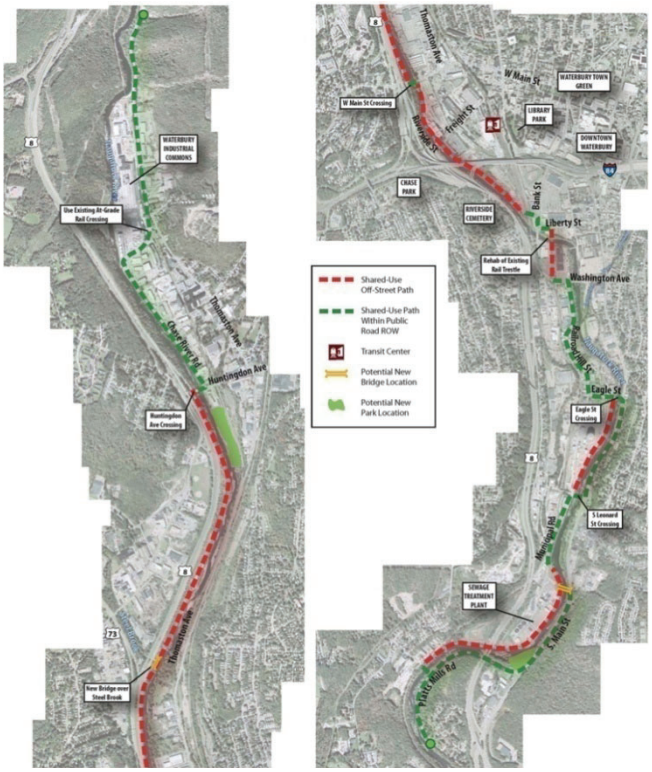
Table 2. Evaluation Criteria

Criteria		Maximum Score
Landowner Support	• Land is publicly owned: 25 pts • Definite support of landowners: 20 pts • Potential/likely support of landowners: 15 pts	25
Multiple Uses	• Bicycles: 3 pts • Pedestrians/runners: 3 pts • River use: 2 pts • Other: 2 pts	10
Reasonable Cost	• Can be accomplished within typical unit costs for similar projects/applications • Cost is reasonable for value expected	15
Mobility / Connectivity	• Does it connect? • Will it provide access to desired community destinations? • Does it provide direct access to the river? • Does it provide possibility of future connections? • Does it enhance public transportation options? • Does it connect to identified, obtainable land parcels?	15
Community Benefits	• Quality of life • Recreational opportunities • Educational opportunities • Neighborhood enhancement • Environmental/river improvement and beautification	15
Economic Development	• Access to land that can be developed • Will promote redevelopment	20
	Total Score (100 max)	**100**

Based on extensive community input, data analysis and field review, six alternatives were considered in the development of this Study. While each alternative was developed as an independent alignment, some portions of each alternative offered more feasible greenway options than others. As such, the entire alignment found within low-scoring alternatives was not necessarily discarded in the route-alignment analysis. Consideration was given to feasible sections of greenway in each of the six alternatives during the development of Option E, the highest scoring alternative. Summaries of the six options include:

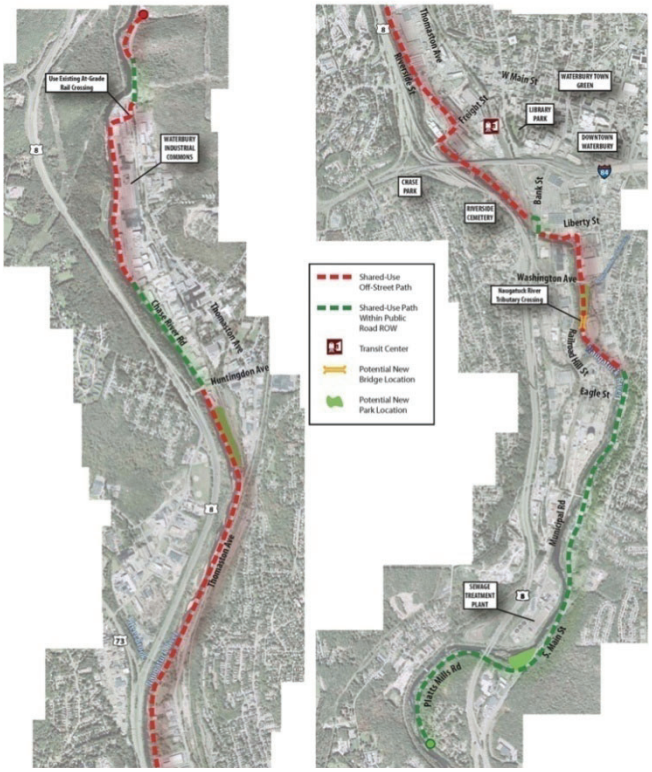
Option A: King's Mark ERT Recommended Alignment: The ERT report included a text description of a potential route; the consulting team illustrated this as a baseline alternative. This alternative emphasized the experience of the river as a natural corridor and shows the trail switching sides of the river at several locations.

Map 14. Option A



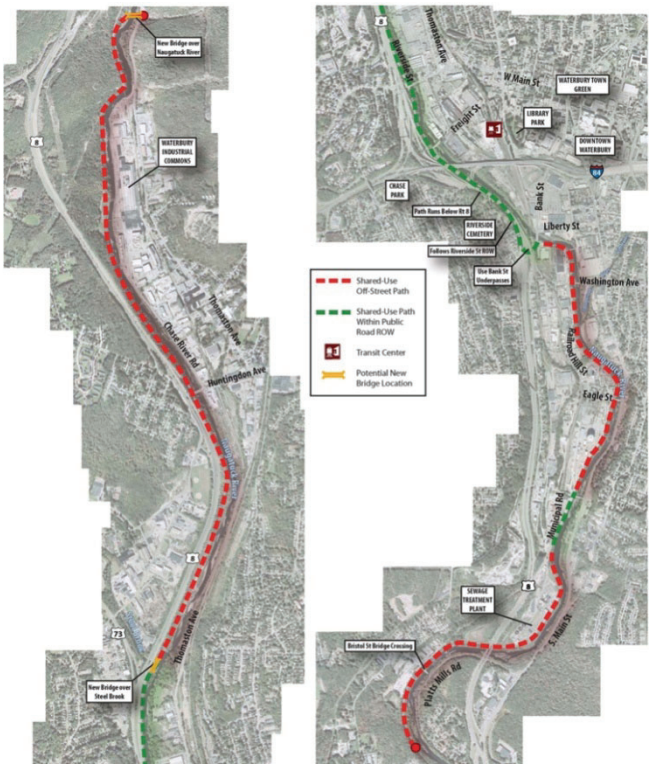
Option B: East River Bank Alignment: This concept showed a continuous trail on the east bank between downtown and the river. This route provides important connections to downtown, the Intermodal Transportation Center and other destinations in the center of the city. The East Bank option was included as a concept in the ConnDOT preliminary plans for future reconstruction of the Mixmaster.

Map 15. Option B



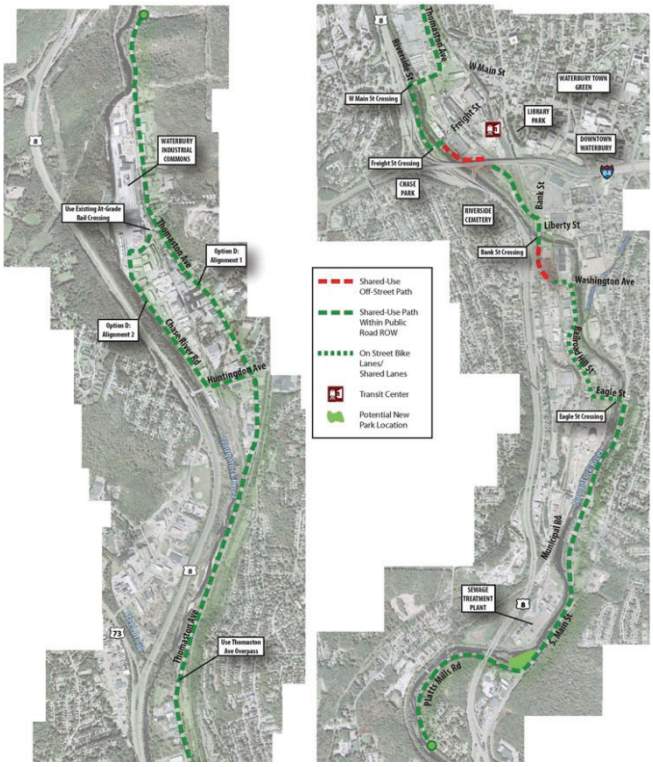
Option C: West River Bank Alignment: This option considered a shared-use path along the west side of the river, primarily between Route 8 and the river's bank. South of the Waste Water Treatment Plant, the Greenway becomes a "rail-with-trail" configuration.

Map 16. Option C



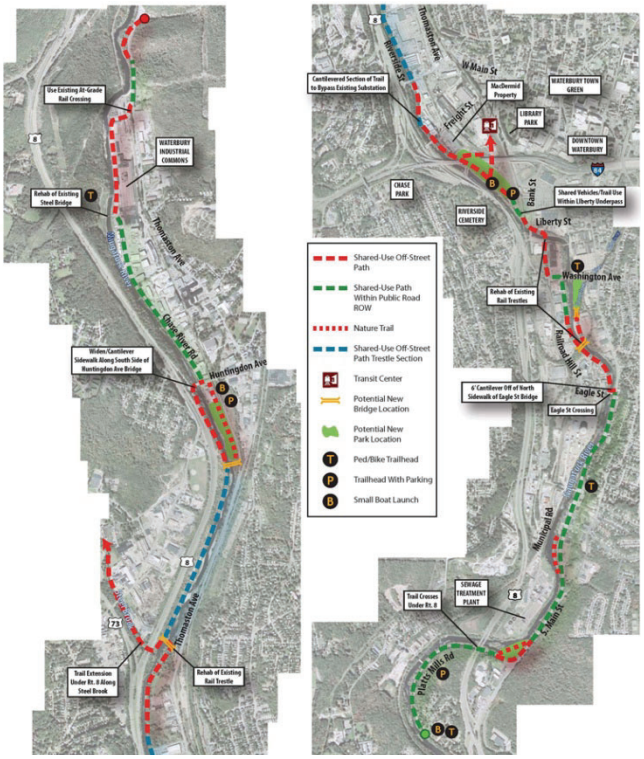
Option D: Roadway Corridor Alignment: This alternative looked at locating the trail within existing public road rights-of-way in order to assess if an on-road route could reduce the challenges associated with land acquisition in the corridor.

Map 17. Option D



Option E: Hybrid Greenway Alignment: This alternative integrated concepts identified in the first four routing options. The hybrid route features a trail that is as close to the river as possible, based on opportunities and constraints and maximized connectivity, safety, economic development potential and the other factors identified in the study criteria.

Map 18. Option E



Option F: River Loop Alignment: This option is a long-term vision to create a continuous trail along both sides of the river. This option could be developed in phases as opportunities become available to complement the primary alignment and to create a trail system that will connect the entire river corridor.

These options were developed and scored using the recommended evaluation criteria, as well as professional judgment and community input. The highest scoring alternative for the Waterbury Naugatuck River Greenway route alignment is Option E, the Hybrid Greenway Alignment. The results of the evaluation criteria scoring process are provided in the matrix on the next page.

Map 19. Option F

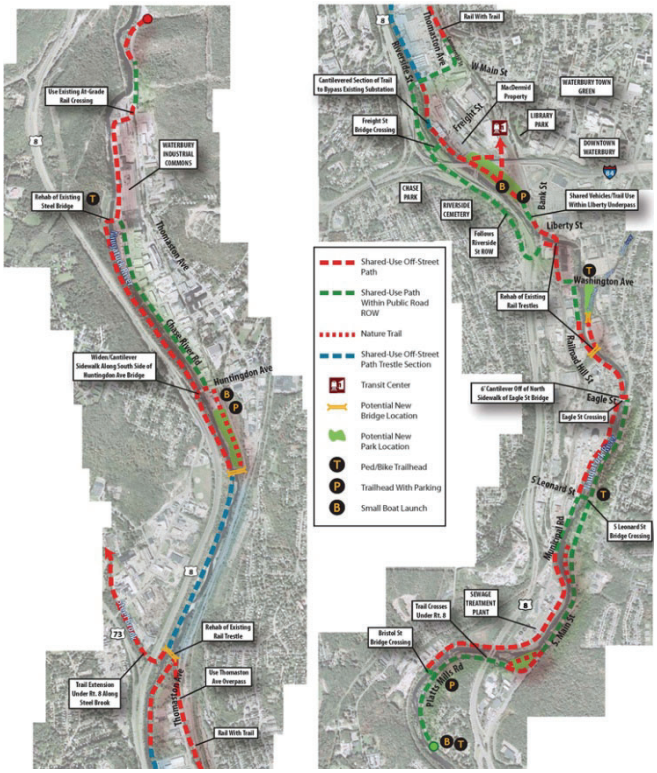
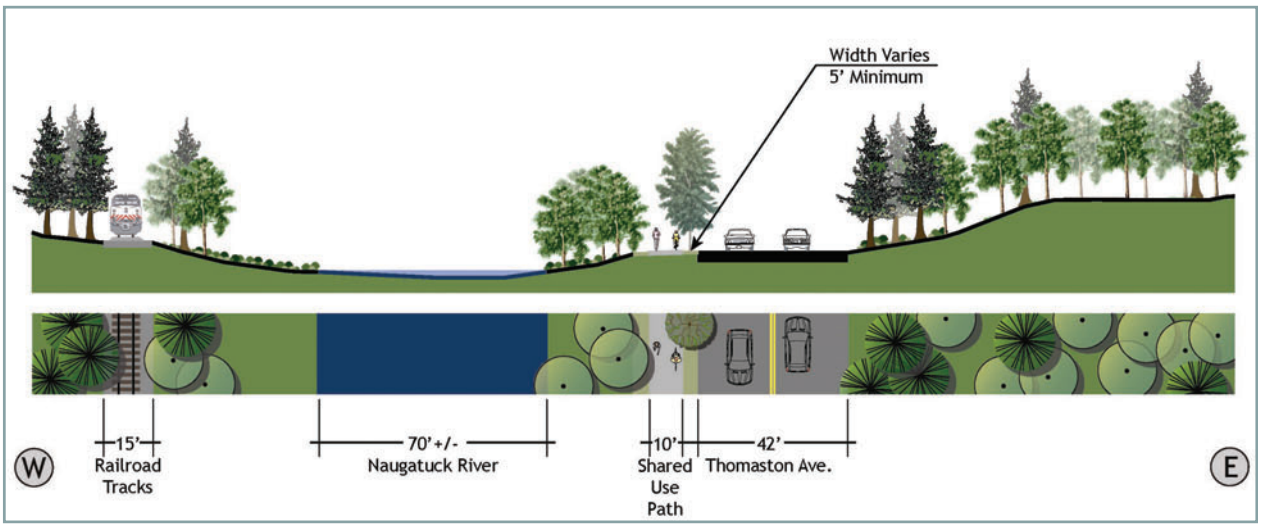


Table 3. Evaluation of Options

Naugatuck River Greenway Alignment Options						
Criteria	Option A: ERT Recommended	Option B: East River Bank Alignment	Option C: West River Bank Alignment	Option D: Roadway Corridor Alignment	Option E: Hybrid Greenway Alignment	Option F: River Loop Alignment
Landowner Support (max 25)	20 A mix of public ownership along roads and some supportive landowners	18 Potentially fewer supportive property owners between Eagle and Bank streets	22 Long stretches of the alignment are in ConnDOT right of way along Route 8	24 Nearly the entire alignment is within public rights of way	20 A mix of public ownership along roads and some supportive landowners	15 Similar to E but more private land owners to negotiate with on both sides of the river
Multiple Uses (max 10)	9 Multiple modes are accommodated well along both sides of the river; boat launches not clearly defined	6 Difficult to access for those on foot or bike from the west side neighborhoods	6 Difficult to access for those on foot or bike from the east side neighborhoods	5 Not as well connected to the river as other options, limiting river use and pedestrian comfort	10 Maximized connections to the river and allocation of trailheads and boat launches	10 Maximized connections to the river and allocation of trailheads and boat launches
Reasonable Cost (max 15)	12 Calls for two new bridges but no cantilevers or section of the trail on piles	8 Because of space constraints, $$ work required along Thomaston south of Huntingdon Avenue	8 Expensive grading and environmental mitigation for west bank trail north of Huntingdon Avenue	15 Along public right-of-ways with no new bridges and limited trail work	12 One new bridge and some cantilevering required along with trail sections up on piles	8 The longest alignment with a new bridge, cantilevers, trail sections up on piles
Mobility / Connectivity (max 15)	10 No proposed connection to downtown, transit center or many other areas (beyond the scope of the ERT)	10 Good access and connectivity, but only on the east side	5 Sandwiched between the river and Route 8 for a long stretch and completely disconnected from many of the destinations on the east side, including downtown	5 Very few places to connect directly to the river	13 Mix of good access and connectivity to the river, downtown and adjacent neighborhoods; proposed paths also connect to the transit center and along Steele Brook	15 Similar to E but with additional connectivity to both sides of the river
Community Benefits (max 15)	12 Nice emphasis on environmental education and river awareness	10 No enhancements for the west bank of the river	5 No enhancements for the east bank of the river and significant environmental constraints in a number of areas	2 Significant noise issues and little if any opportunity for river beautification or educational opportunities	15 Option includes mix of street and river enhancements; proposed nature paths will maximize access to environmental education	15 Same as E but even better because of accessibility to both banks
Economic Development (max 20)	18 Alignment accesses most vacant or underutilized industrial & commercial parcels	18 Accessible to downtown and most vacant industrial sites, given that most are on the east side	5 No direct access to downtown and many of the prime parcels which are on the east side	8 Some access to downtown and the prime redevelopment parcels on the east side	20 Good access to downtown, transit and most vacant industrial and commercial parcels	20 Good access to downtown, transit and most vacant industrial and commercial parcels
Total Score (out of 100)	**81**	**70**	**51**	**59**	**90**	**83**

IV. Proposed Greenway Route

The recommended Waterbury Naugatuck River Greenway route alignment is Option E, the Hybrid. The major elements of the proposed greenway route are described from north to south as follows.



Naugatuck River and Thomaston Avenue cross-section looking north in the area just south of Spruce Brook Road.

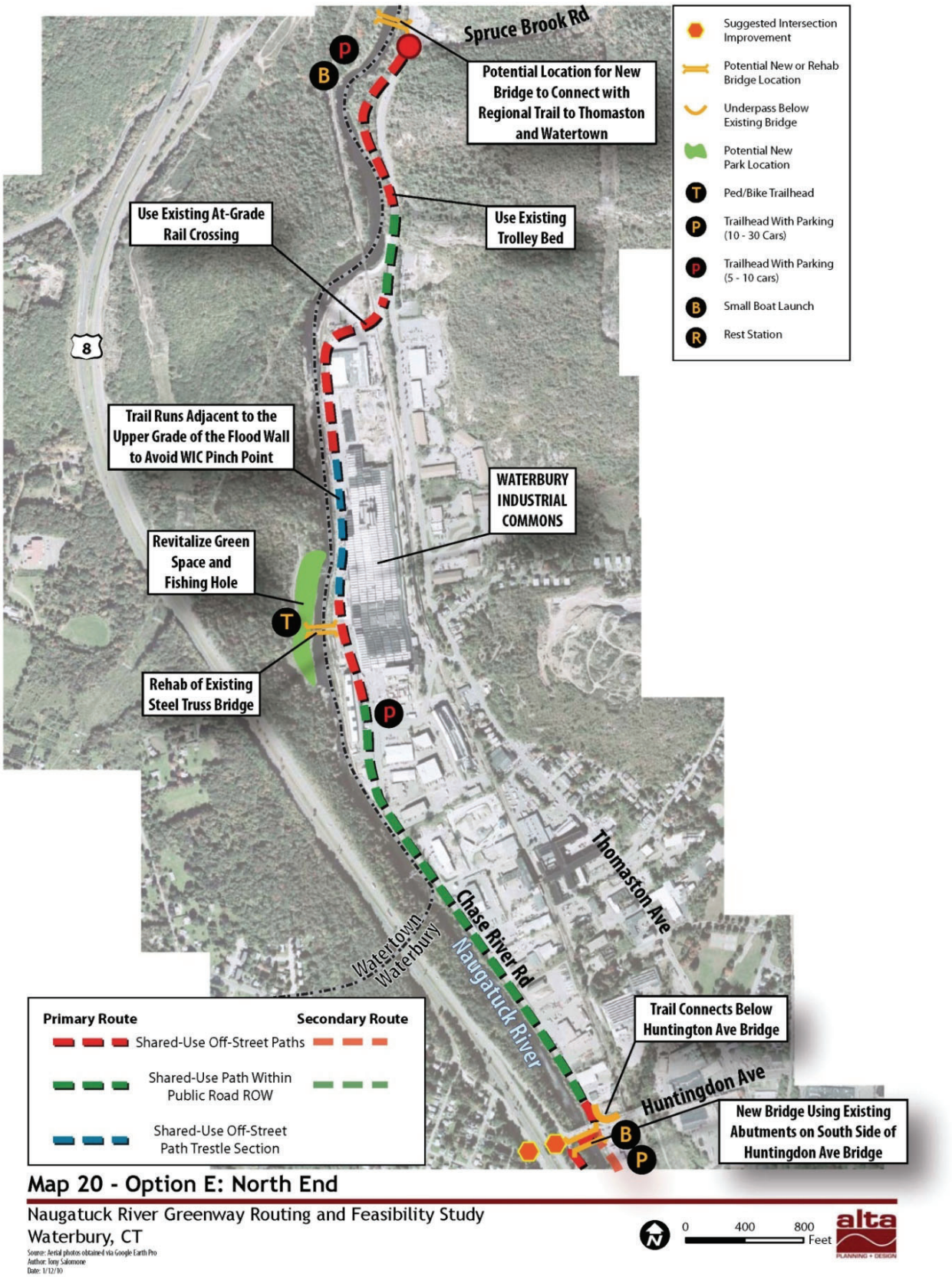
North End

Beginning at the City line with Thomaston on the east bank of the river, a trailhead along Thomaston Avenue provides river access for the water trail (a put-in for canoes and kayaks) and a small parking area. The trail will proceed south, parallel to the road, then follow the river adjacent to the floodwall at the Waterbury Industrial Commons (WIC) site. A potential platform for the Railroad Museum of New England's Naugatuck Railroad can be established at the existing at-grade crossing to provide intermodal connections between trail and rail services. Historic interpretation of the railroad heritage will be an important element at this location.

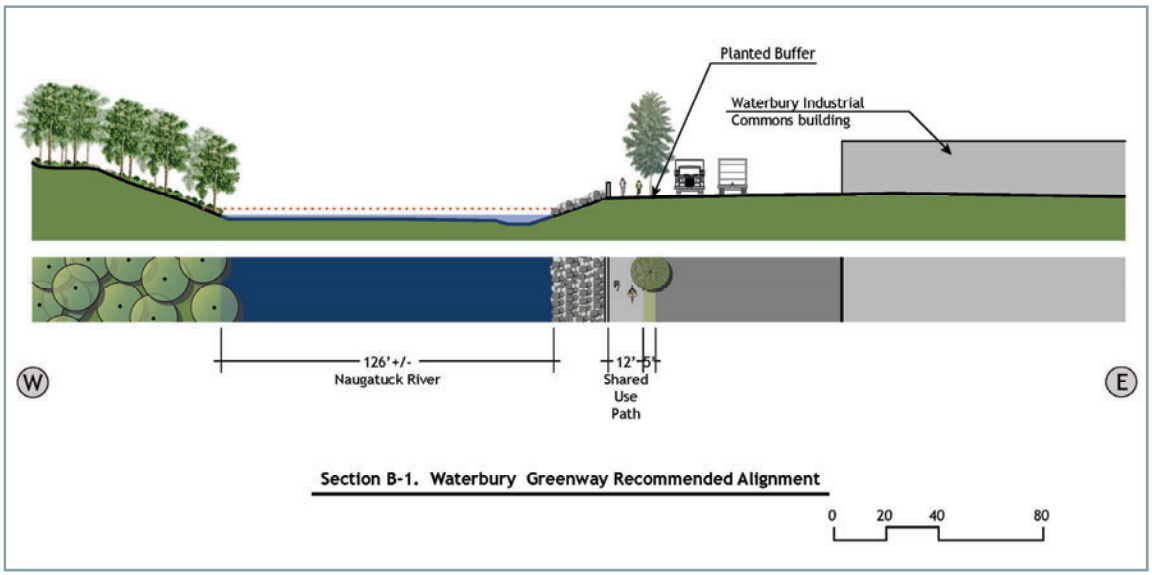
The WIC will be the new home of the City's Department of Public Works (DPW), providing an opportunity to highlight DPW's role in operations and maintenance of the trail, as well as providing access for employees to use the trail. At the same time, careful consideration must be made in the detailed design of this section to assure safety and security for DPW operations and to coordinate trail development along the river within the existing Army Corps of Engineers flood management easement.

The existing steel truss bridge offers a unique opportunity to access the open space and fishing holes along the west bank of the river. (Grant money for improvements is being sought by the City)

Map 20. Option E: North End



A second trailhead and rest area will be located at the west end of the existing steel truss bridge at the WIC site, which provides access for fishing and mountain biking. Public access to the abandoned utility station in this area must be prohibited, since the station contains open wells and pits with rusted, sharp debris and equipment. A small river rapids viewing area and whitewater course can be created at this location as well. Parking for these amenities will be accommodated curbside along Commons Court.



For most of the length of the WIC site, the greenway trail will run adjacent to the floodwall without impeding the movement of vehicles closer to the building.

The decision to recommend the primary greenway alignment near the top of the Army Corps of Engineers flood wall adjacent to the WIC site was made very carefully to coordinate with the future DPW facility planned for the site. This section of trail will begin at the existing steel truss bridge and run adjacent to the top of the wall within the existing Army Corps easement towards the northern edge of the WIC property. From the northern end of the WIC site, the greenway will return to grade and continue through a portion of the parcel to the north, cross the active railroad tracks at an existing at-grade crossing and connect to the trail parallel to the west edge of Thomaston Avenue.

The design of the greenway in this section offers a unique opportunity for walkers and cyclists to enjoy views of the river and experience walking or riding safely next to the flood wall high above the river's edge. The trail will be constructed on earth fill at the same approximate elevation as the top of wall. For a portion of the segment, where adjacent structures create pinch points, the earthen fill will be supported by a retaining wall on the east edge. This high-level viewing area will create an interplay between nearby industrial uses—the Naugatuck's heritage—and recreational use

View of levee wall in the approximate location of the greenway trail running adjacent to the top of it.

of the river—the Naugatuck's future. Coming from the north, this section of the greenway (along with the nearby reused steel truss bridge) will form a unique gateway, signifying one's symbolic entry into the City of Waterbury.

Security will be an important design consideration to prevent encroachment onto the future DPW facility from the trail and to provide physical separation along the length of the WIC property. At the same time, access to the trail will be an important benefit to employees at the WIC who want to walk or bike to work or enjoy some lunchtime physical activity. In addition to the trail's alignment at the top of the flood wall, fencing, warning signs, and security cameras can protect the fleet of vehicles and equipment that will be stored on the site. Fencing and signage will also create a clear distinction between the parking and driveways specifically dedicated for DPW use and areas available for public access. The clear separation will keep trail users away from DPW operations.

The existing 23-foot-wide Army Corps maintenance easement along the wall will be preserved. The Army Corps has indicated that the greenway trail does not present a conflict with the easement as long as maintenance-vehicle access is maintained, subsurface features such as footings and drains remain undisturbed, and that no trees or permanent structures are planted or placed within the easement.

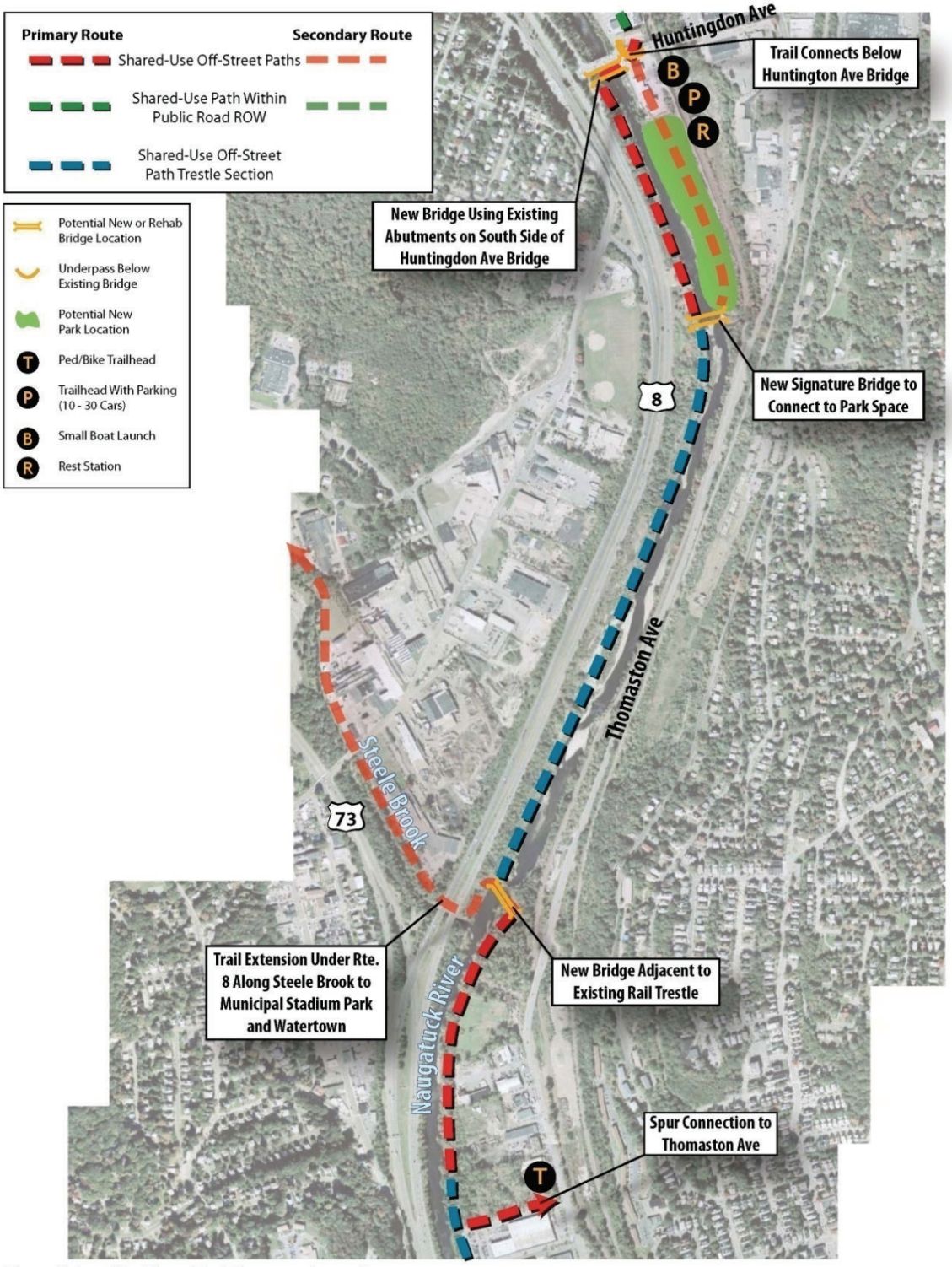
Thomaston Avenue Section

South of the WIC, the trail will run along the west side of the Chase River Road right-of-way and will continue south towards Huntingdon Avenue. At the Huntingdon Avenue bridge, a new pedestrian/bicycle bridge will carry the trail across the river to the west bank, utilizing the existing bridge abutments to support the new structure. The main trail can be routed below the existing bridge using switchbacks to avoid the at-grade crossing of this busy road. Safety enhancements can be provided at street level to improve access for pedestrians and bicyclists who prefer to cross at grade. Additionally, intersection improvements at Colonial Avenue and the on/off ramp will enhance pedestrian and bike connections from the nearby neighborhoods to the trail.

Chase River Road existing conditions

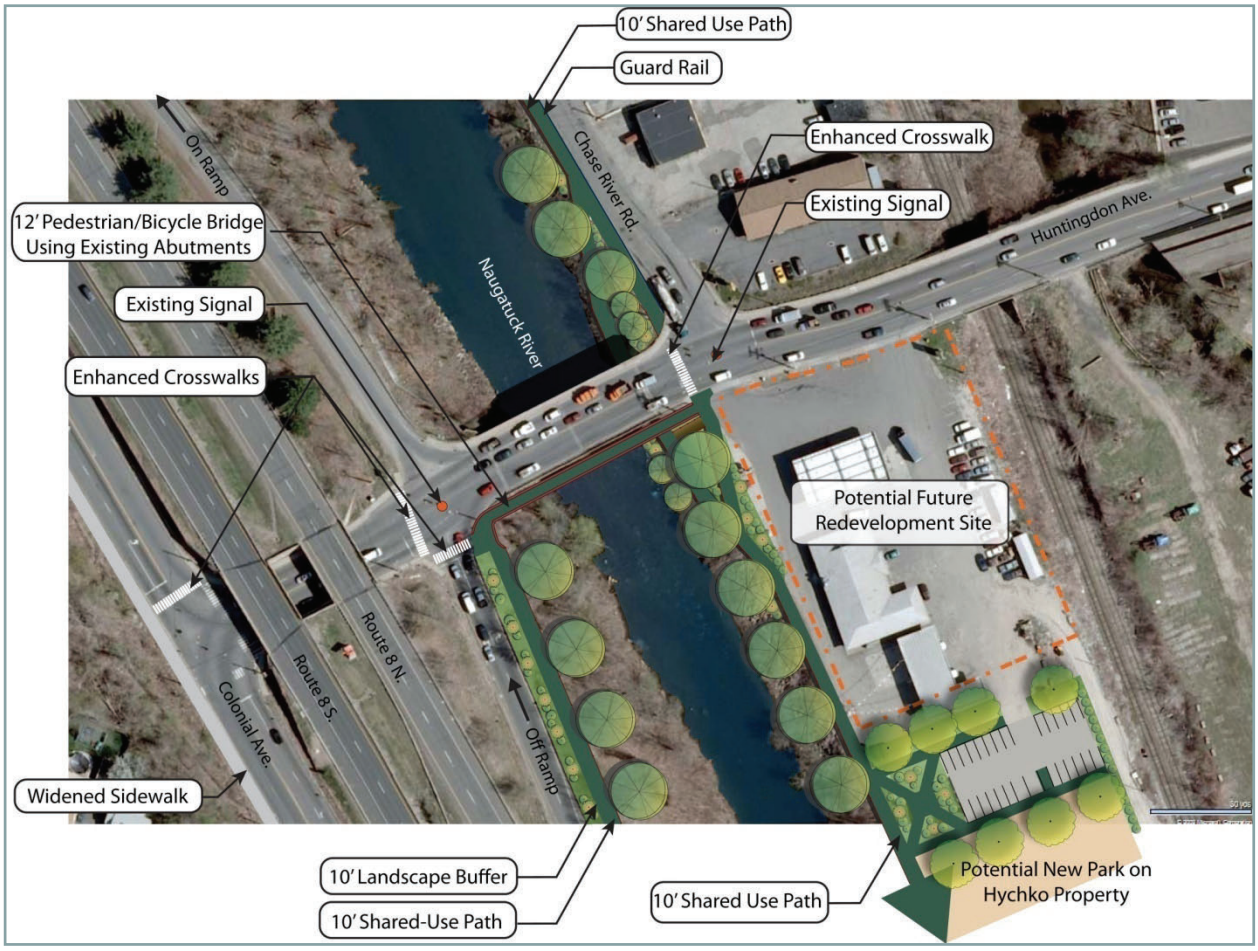
Narrowing the wide travel lanes along Chase River Road provides the necessary space to accommodate the greenway trail and adjacent crash barrier at the top of the river bank.

Map 21. Option E: Thomaston Avenue



View from the river of the Huntingdon Avenue bridge featuring the new greenway bridge and the greenway passing below it and the existing structure

Huntingdon Avenue Bridge existing conditions



Plan detail of the Huntingdon Avenue bridge showing the greenway trail along both sides of the river, the underpass, and the new greenway bridge immediately downriver from the existing structure

A key right-of-way in this section will need to be negotiated at the Hychko property, which is currently a scrap yard for motor vehicles. Ideally, this negotiation will include public access to create a loop trail on both sides of the river in this section. A new pedestrian/bicycle span across the river at the southern end of the existing scrap yard can serve as a signature design element for the greenway. The scrap yard can be the source of materials for a 'found art' sculpture park and trailhead featuring vehicles such as the 1950's-era Waterbury transit buses stored on site. The trail will continue south between Route 8 and the river as an elevated section built on piers (where necessary) to preserve the natural setting in this section and avoid the

Portions of the greenway will be elevated on piles to avoid wetlands and the river floodway, similar to the Rattray Marsh walking trail in Mississauga, Ontario.

flood waters. At the mouth of the Steele Brook, a potential connection exists to a proposed spur trail heading west under Route 8 towards Municipal Stadium and Watertown. The main greenway trail will cross the river using a new bridge adjacent to an existing railroad trestle and continue along the east bank of the river towards downtown.

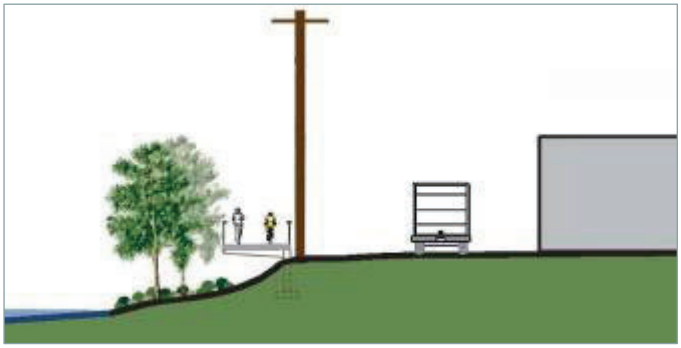
Existing conditions of river adjacent to scrapyard site.

A new bridge connecting the main greenway trail on the west bank with a potential new park space on the scrap yard site could become a signature element for the greenway.

Due to challenges of topography, floodway conditions and proximity of existing buildings, the trail is proposed as an elevated trestle section behind the existing Colonial Plaza shopping center. Coordination with potential re-development can create new opportunities for trail-oriented business in this section. This site offers an existing retail zone with direct access from the trail for a bakery, bike shop, convenience store, restaurant or other related services. A trailhead at this location will capitalize on these opportunities. Due to the difficulty of making a connection to the Colonial Plaza in its current configuration, a short spur trail located just north of the shopping center will connect the trail to Thomaston Avenue to the east.

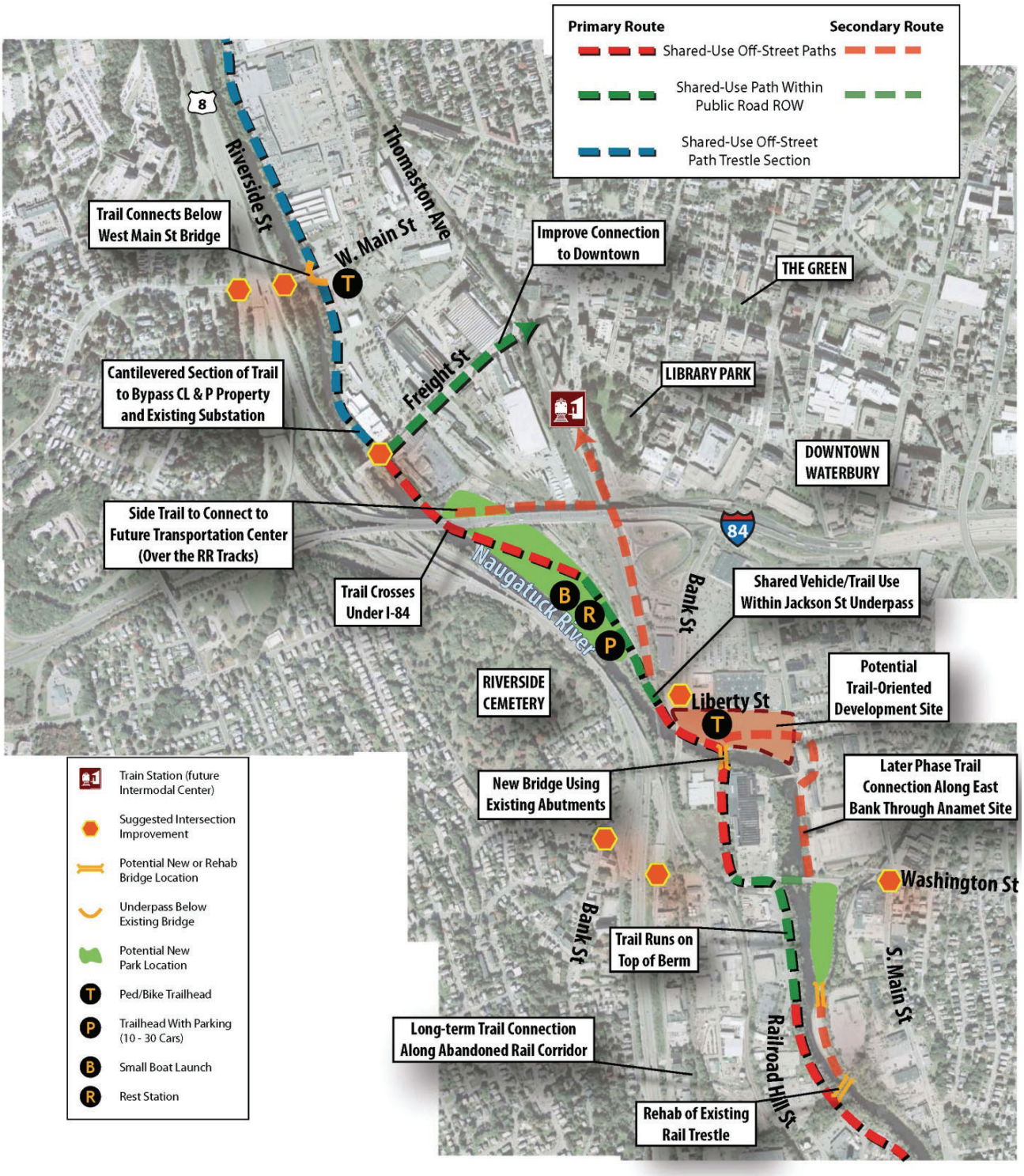
Downtown Section

The trail will then continue as a trestle section south to West Main Street, which will require improvements for both pedestrian and bicyclist crossings at the existing signal to the west, as well as an undercrossing below the West Main Street bridge. This will serve as the primary trail route. Heading south, careful coordination will be required to maintain security at the CL&P transformer substation. Key access easements from CL&P and MacDermid Corporation will be needed.



Due to topographical and floodway constraints, the trail will run on top of the existing retaining wall behind the Colonial Plaza Shopping Center.

Map 22. Option E: Downtown



Map 22 - Option E: Downtown

Naugatuck River Greenway Routing and Feasibility Study
Waterbury, CT

Source: Aerial photos obtained via Google Earth Pro
Author: Tony Salomone
Date: 1/12/10

0 400 800 Feet

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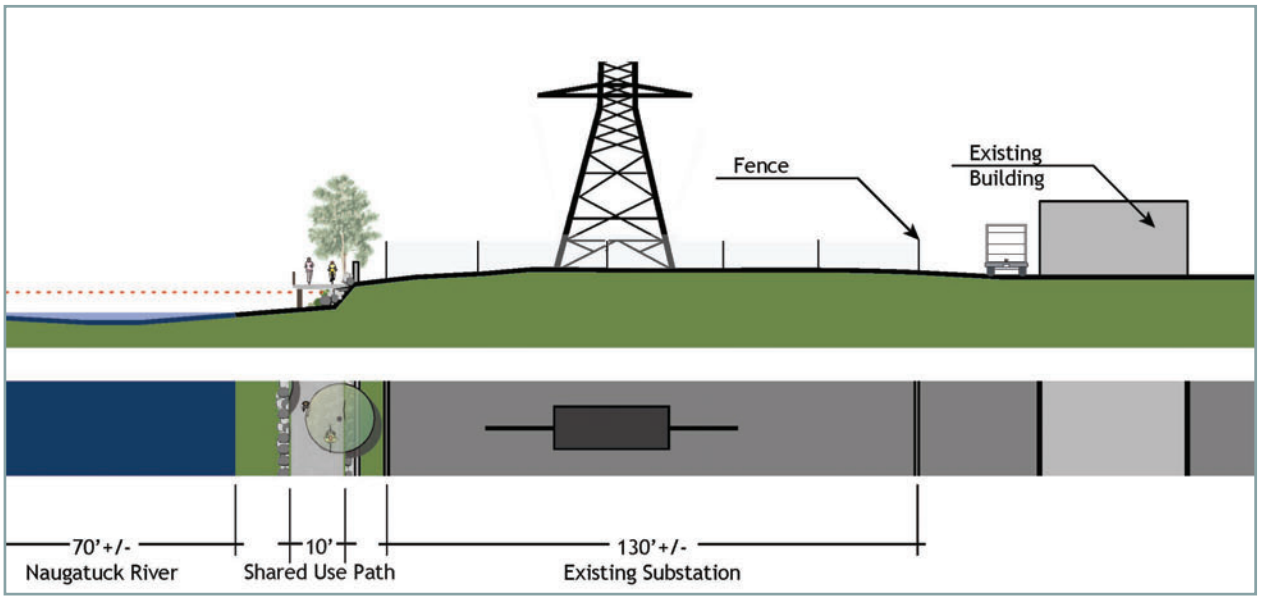
Because of the relatively low traffic volumes on Freight Street, the Greenway will cross at grade. This connection, just east of the Freight Street bridge, could include either a high visibility crosswalk and median refuge island or a pedestrian-actuated traffic signal (more detailed traffic analysis will be required before a final determination is made). The refuge island and the areas where the trail intersects the sidewalks will provide space for cyclists and pedestrians to wait for vehicular traffic to stop. From this point, on-street bikeway enhancements (bike lanes) and sidewalk improvements are recommended on Freight Street to link to the Green and the rest of downtown. (Similar treatments should also be considered along West Main Street.) This will ensure that important downtown destinations are connected to the trail, including the YMCA, the Mattatuck Museum, City Hall, Palace Theater, UConn, the hospital and downtown businesses.

The Eastbank Esplanade in Portland, Oregon illustrates one way for a trail to be cantilevered over water to avoid a significant barrier.

Approximate alignment of the greenway trail adjacent to the MacDermid office building.

At the southern end of downtown, the Study recommends the long-term development of a spur connection to the train station and future Intermodal Transportation Center site, using either a new pedestrian/bike bridge or the I-84 elevated structure to carry the trail over the multiple railroad tracks (at a minimum clearance of 22.5 feet). This is a key transportation connection, providing access to Metro North commuter trains and local bus service. This spur trail will also provide improved access from the trail to Library Park and the area surrounding City Hall. In the short term, the improvements along Freight Street will provide a connection to the train station and downtown. Additionally, a rail-with-trail spur along the east side of the tracks has strong potential to link the train station with the greenway underpass at Jackson Street. The potential also exists to extend the Naugatuck River Railroad tourist train service to the Intermodal Transportation Center if a 1,000-foot-long track easement can be created along the sidings of the historic train station and the landmark Waterbury clock tower.

The trail will continue at-grade under the I-84 Mixmaster interchange structure and along a proposed new Jackson Street shared-use (vehicles and bikes) corridor with a crossing under the existing railroad trestle bridge. The area between I-84 and the trestle has significant potential as a new urban environmental park and sculpture garden to form a connection between downtown and the river. The underutilized property immediately to the southeast of the Liberty/Bank Street intersection is an opportunity for new trail-oriented development project such as a restaurant, kayak rental or bike shop. South of



To avoid the CL&P transformer substation, the greenway trail will cantilever out over the riverbank for a short distance.

Area south of I-84/Route 8 interchange existing conditions

The new park and sculpture garden adjacent to Jackson Street will include a put-in for paddlecraft.

Jackson Street railroad trestle existing conditions

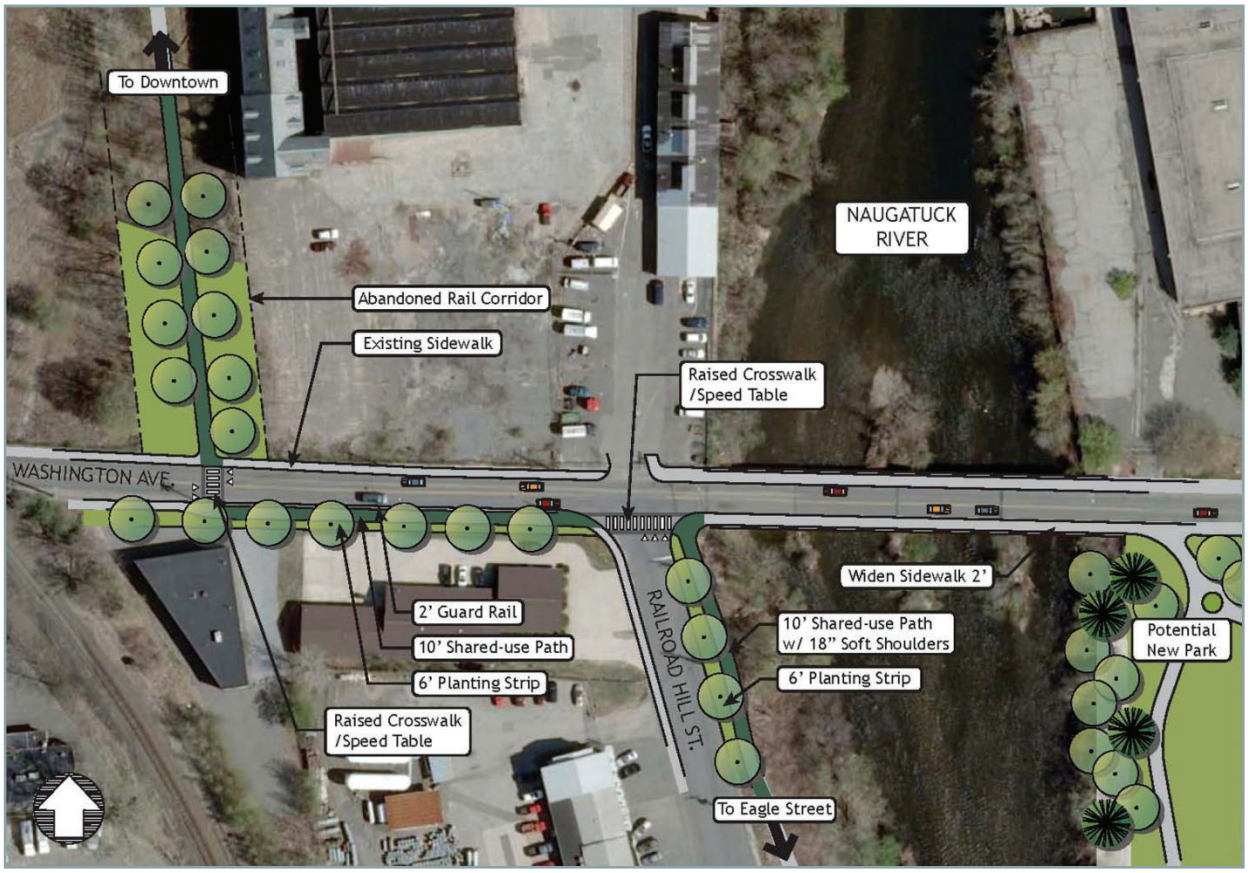
Future view of the Jackson Street underpass which will lead to a riverfront sculpture park and small boat launch.

downtown, the trail will cross the river on a new bridge using the existing abutments from a former railroad trestle and continue south along an abandoned railroad corridor to Washington Avenue. The trail will pass by a power plant facility recently developed by the FirstLight Company. It is utilized intermittently, typically when the power system has reached peak load during hot summer days and demand for power spikes. When activated, the small power plant is loud and a potentially unpleasant facility to pass by on foot or bicycle. To help mitigate this concern, additional landscaping and a minimum 10' sound wall should be built along the east edge of the greenway up to Washington Avenue.

The wall will also provide additional security for FirstLight's facility and ensure greenway users are not trespassing into a potentially hazardous area. The sound wall can be designed to feature interpretative

Railroad Hill Avenue existing conditions

The trail from Washington Avenue will run adjacent to Railroad Hill Avenue before making its way along the river to the Eagle Street bridge.



The greenway trail as it passes from downtown to Washngton Avenue and south alongside Railroad Hill Street.

panels describing the area's role in electrical power generation. After a jog to the east, the greenway will continue south along an at-grade section utilizing the wide portion of riverfront land on the west bank of the river parallel to Railroad Hill Street. On the opposite bank, a new trailhead and small riverside park can be created at the east end of the Washington Avenue bridge.

In the long term, this Study recommends a loop in this area with trails on both banks of the river if additional funding is available. The secondary, east-bank portion of the loop could cross on a cantilevered sidewalk on the south side of the existing Washington Avenue bridge, creating a ten-foot wide path connection across the river. It could utilize an easement through the abandoned Anamet Factory site, potentially supporting a redevelopment of this property in the future. At the north end of the Anamet site, the trail could either divert around the existing industrial building that sits directly atop the river bank, go through the building, or swing out over the river on a cantilevered section. Beyond that, the secondary trail is likely to continue west along Liberty Street and connect with the primary greenway trail near the Liberty and Bank intersection.

The trail will continue south along Railroad Hill Street for a short stretch and then along an easement adjacent to the river, eventually leading to a redevelopment parcel at Eagle Street that could be an ideal location for a brew pub or cafe. A cantilevered section will be required at this point to bypass an existing building very close to the river's edge and connect to the Eagle Street bridge. Because of the very narrow existing sidewalks, the trail will cross the Eagle Street bridge on a widened north sidewalk to connect to South Main Street.

If widening the north sidewalk is not possible structurally, an alternative is to route the trail below the Eagle Street bridge, where there is clearance for the greenway. A new pedestrian/bike bridge could then

be built immediately downriver from the existing bridge to connect to South Main Street on the east bank. Because the river is relatively narrow in this section, the net cost of a new bridge may be similar to the cost of the cantilevered section (though additional funds would be needed for the additional underpass connection).

North of the Eagle Street bridge there is an abandoned rail line and trestle sitting high above the grade of the river's east bank and connecting to a berm on the west bank. Called the Poughkeepsie Rail Spur, its right-of-way connects to the Waterbury train station to the northwest and runs along a tributary of the Naugatuck River northeast to the Brooklyn neighborhood. This corridor has potential to serve as a spur trail from the core greenway route along the river. As such, efforts should be taken to preserve the right-of-way and the existing trestles over the tributary near Washington Avenue, the Naugatuck River, over Railroad Hill Avenue and the adjacent Main Line that carries Metro North commuter trains. This corridor could eventually connect with the proposed spur from the train station south to the Jackson Street greenway underpass. Additionally, the existing lot at the corner of South Leonard Street and Porter Street could be used as a parking area for the future trail.

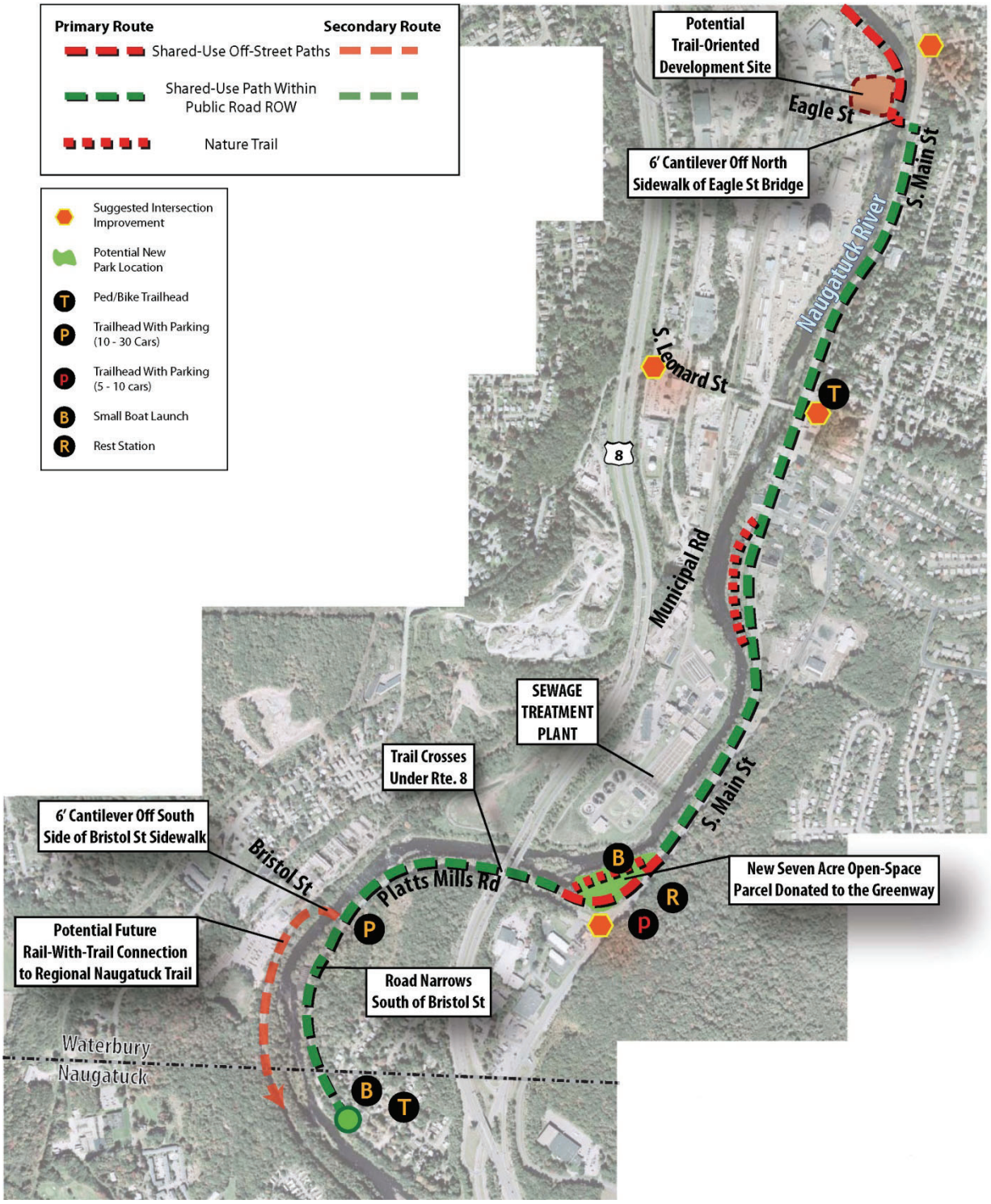
West end of the Eagle Street bridge existing conditions

The redevelopment parcel at the west end of the Eagle Street bridge could be an ideal location for a restaurant or brew pub.

South Main Street Section

Since it was superseded by Route 8, South Main Street carries very little traffic for a roadway that contains four lanes in most areas south of Eagle Street. Because of this, the trail will be created within the existing right-of-way and a 'road diet' plan will reallocate the roadway to maintain two or three travel lanes rather than four. A small nature trail loop can be extended in this section to provide both a quiet experience along the river while keeping the more direct travel route for the trail along the road. Interpretation of active local industry can be provided at viewpoints looking across the river towards the Yankee Gas distribution facility. Intersection improvements at Washington, South Leonard and Piedmont streets will enhance pedestrian and bike connections from nearby neighborhoods.

Map 23. Option E: South Main Street



Map 23 - Option E: South Main Street

Naugatuck River Greenway Routing and Feasibility Study
Waterbury, CT

Source: Aerial photos obtained via Google Earth Pro
Author: Tony Salomone
Date: 1/12/10

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South Main Street offers a prime opportunity to develop a mile-long section of the greenway along a single parcel of land that is currently in public ownership. Traffic volumes are lower than the designed capacity of the roadway, which currently has four travel lanes for most of the stretch in which the greenway trail is planned (see Traffic and Roadway Capacity section of report starting on page 10). Based on preliminary analysis, there is a strong possibility that South Main may not need more than one travel lane in each direction from Platts Mills Road to Eagle Street, provided that left turn lanes are incorporated where necessary to enable access to side streets and frontage properties. "Road Diet" schemes such as this are becoming more common as cities throughout the country aim to provide complete streets with new facilities for pedestrians and cyclists. While the preferred design will require future study and negotiations with ConnDOT, the South Main Street corridor can accommodate a 10-12' wide multi-use path whether a travel lane is removed from the roadway or not. If four lanes must remain, options to retain the trail on the east side of the river include the narrowing of the desired 10-15' landscape buffer, the use of easements through the narrow parcels adjacent to the South Main right of way and possible use of trestle sections of the trail over wetland areas close to the river.

The west bank of the river south of Eagle Street is far less desirable as a location for the greenway because of the following constraints:

- In preliminary meetings with both the Yankee Gas Company and the Waste Water Treatment Plant facility, representatives expressed safety, security and access issues that would make it very difficult to incorporate the trail onto these properties.
- The Yankee Gas site is enclosed on its east edge by a two-layer security fence topped with barbed wire and razor wire (see photo). These security fences are placed directly on the property line and leave no space along the river bank for a shared-use trail.
- A portion of the Waste Water Treatment Plant's open tanks lie very close to the edge of the river and would require a more expensive, engineered treatment to allow the multi-use path to continue past this constraint.

View of Yankee Gas site along the Naugatuck River (source: Kevin R. Zak).

- A new river bridge would need to be built downriver from South Leonard Street to connect to the future seven-acre public park at the corner of South Main and Platts Mills Road. While this bridge could have the potential to be a new signature element for the greenway, it would entail significant additional expense and permitting.
- The land uses on the west side of the river prohibit access to the river from adjacent neighborhoods or streets, and the trail would be located in an area that would present challenges to user safety and security.

With the removal of a travel lane, a portion of South Main Street could accommodate the greenway trail and a landscaped buffer.

South Main Street existing conditions

The Waterbury Naugatuck River Greenway's alignment on South Main Street offers one of the best opportunities for the path to be a highly-visible facility to the thousands who drive by on a daily basis. The narrowing of the road, the row of new trees and the adjacent greenway will become an attractive gateway to the City for people heading downtown from the south. The overall streetscape improvements and the presence of walkers, joggers and cyclists could lead to economic development along the street, especially new businesses looking to serve users of the greenway (convenience stores, cafes, bike shops, etc). These opportunities will be limited if the trail runs along the opposite side of the river.

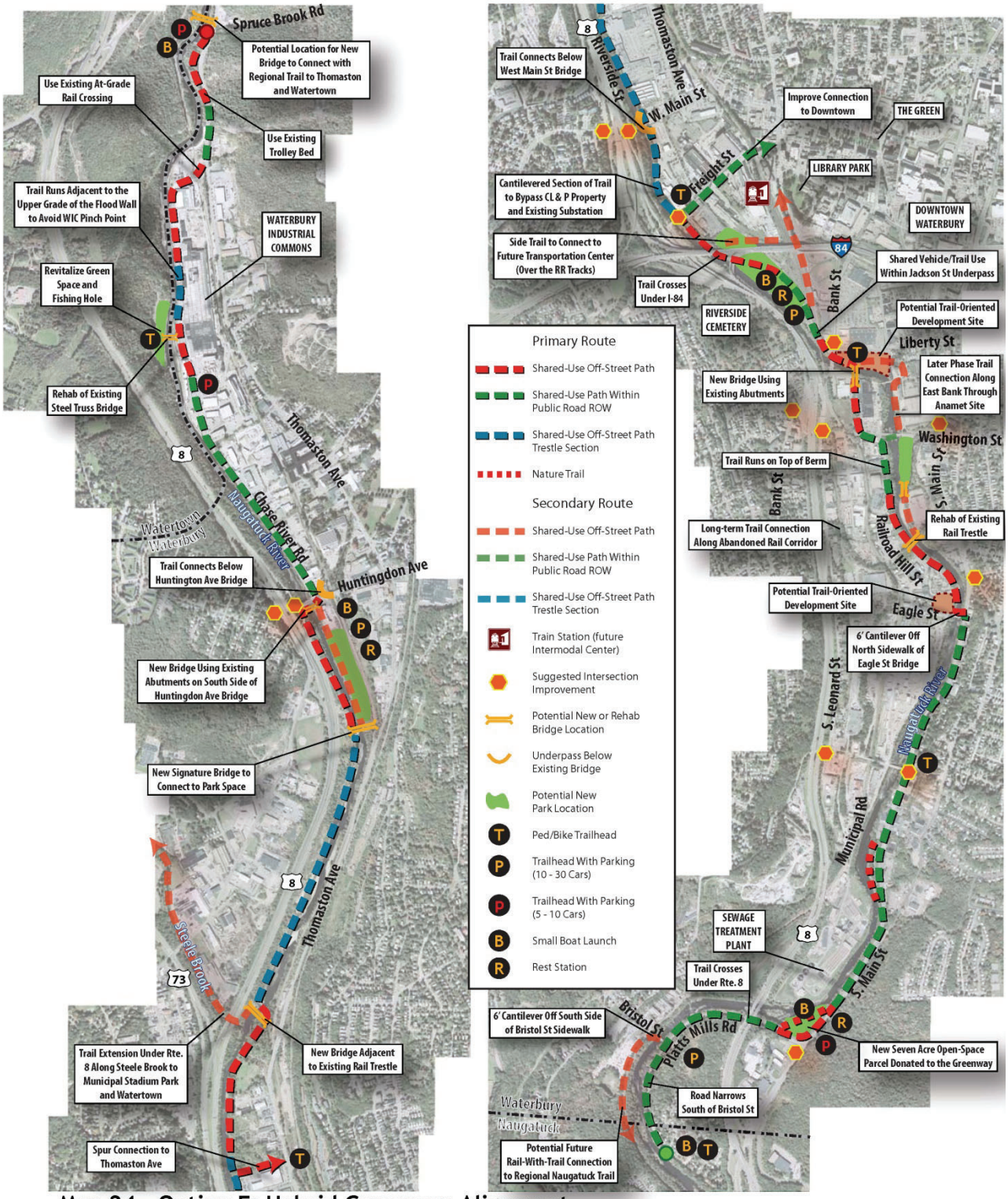
Vehicle access and parking for the existing businesses on South Main Street will need to be carefully considered during subsequent design work for the trail. Consolidation of the long curb cuts along the west side of South Main near South Leonard will ensure safety at greenway crossing points. In this area, space for a wide, tree-lined buffer adjacent to the trail may not be possible in order to preserve parking for the existing businesses. Most of the commercial buildings in this area lie very close to the river's edge, making it very unlikely for the trail to pass behind them along this less-than-quarter-mile stretch of South Main. As the trail is developed, these properties will have new opportunities to create trail-oriented businesses that capitalize on the greenway.

The trail will continue within the South Main Street right-of-way to the intersection with Platts Mills Road. At this point, a new seven-acre nature park will be created, with a small parking area, a trailhead and water trail launching site. This park will be one of the signature natural areas along the trail and was graciously donated to the City by a property owner who supports the Naugatuck River Greenway. Important environmental educational opportunities exist at this site, as well as at the City's water treatment facility across the river from this location. The trail will continue at-grade along the west side of Platts Mills Road and connect to the existing trailhead and small boat launch just beyond the southern city limit. In addition, a future trail spur will cross the river on a cantilevered south sidewalk of the Bristol Street Bridge and continue southward adjacent to the railroad tracks, connecting to the Regional Naugatuck River Greenway, which will eventually run to Naugatuck and Beacon Falls.

Platts Mills Road existing conditions

The travel lanes and shoulders along Platts Mills Road could be narrowed to provide space for the greenway trail.

Map 24. Option E: Preferred Greenway Alignment

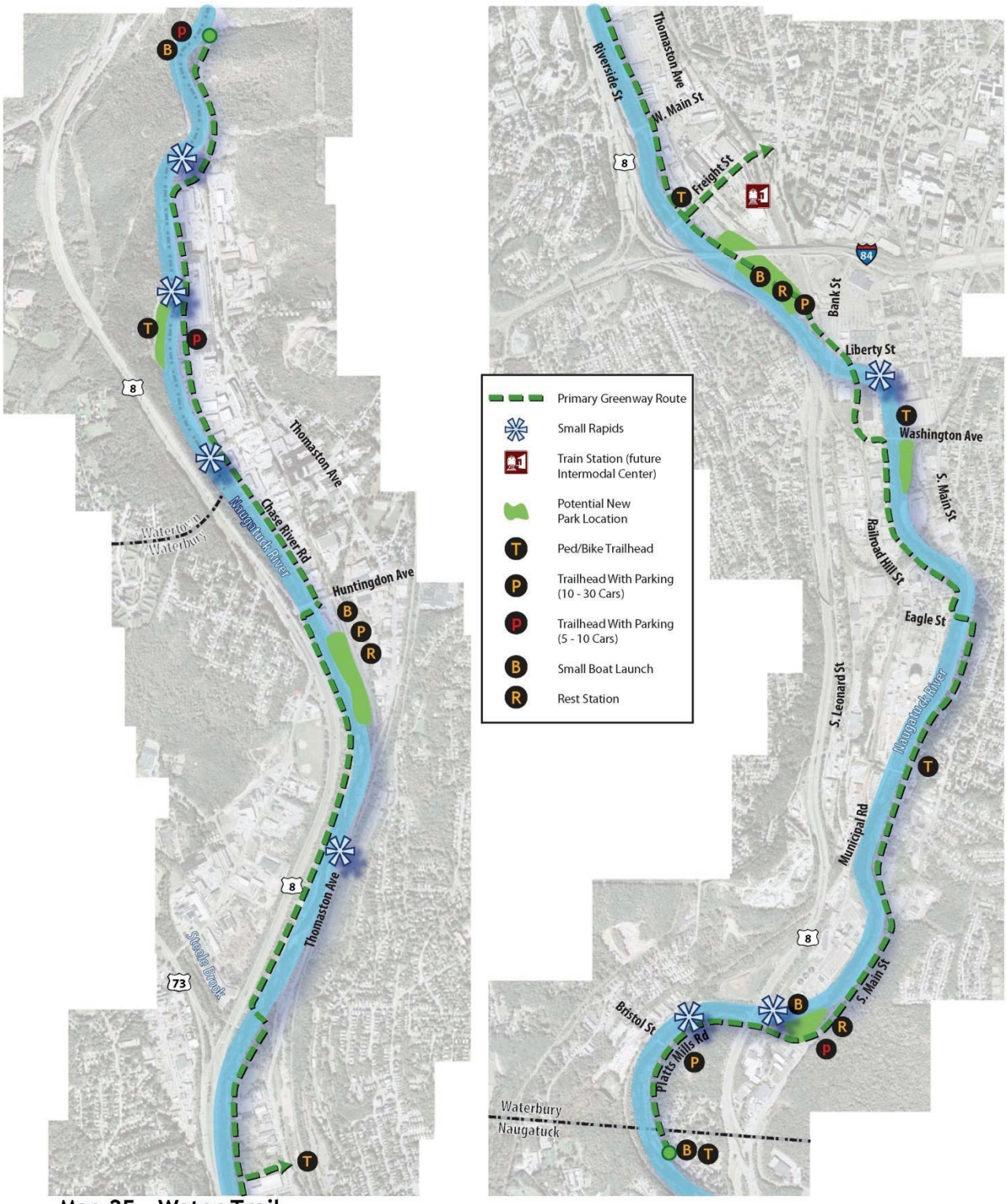


Map 24 - Option E: Hybrid Greenway Alignment

Naugatuck River Greenway Routing and Feasibility Study
Waterbury, CT

Source: Aerial photos obtained via Google Earth Pro
Author: Tony Salomone
Date: 1/12/10

Map 25. Water Trail Diagram



Map 25 - Water Trail

Naugatuck River Greenway Routing and Feasibility Study
Waterbury, CT

Source: Aerial photos obtained via Google Earth Pro
Author: Tony Salomone
Date: 1/12/10

V. Construction

Green Construction

> ***"The achievement of sustainable development requires the integration of its economic, environmental, and social components at all levels."***
>
> - UN Department of Economic and Social Affairs, Division for Sustainable Development

In recent years, interest in environmentally sustainable construction materials and methods has surged. Communities are becoming increasingly aware of the impact their growth and development has on its environment. They are also becoming increasingly aware of the financial, social, environmental and productivity benefits of sustainable design. In many ways the greenway movement is an outgrowth of this growing social consciousness. Greenways play an important part in making communities more sustainable. They provide means of alternative transportation. They can also catalyze the redevelopment of existing urban sites into more productive and sustainable uses.

Despite the inherent value of providing access to the natural environment, poorly conceived greenways could pose a potential risk to the very spaces they are intended to celebrate. If not planned and designed properly, greenway construction can cause undesirable and unnecessary consequences, including:

- Damage to fragile ecosystems
- Increase in stormwater flow
- Deterioration of surface water quality
- Inefficient use of energy resources

Luckily, these consequences ***are*** avoidable. Careful planning will allow the City of Waterbury to develop a greenway system that is as environmentally friendly as it is beneficial to the community.

Currently, no broadly accepted system exists for rating or certifying the sustainability of outdoor recreational facilities. Nevertheless, the concepts developed by the various building rating systems are equally applicable to greenways.

Construction Methods

The various permitting programs to which greenways are subject to help limit potentially damaging construction methods. These permits will place strict controls on the areas of ground disturbance, discharge of sediment-laden stormwater, release of harmful substances into the environment, etc. Additional controls may be considered by the design engineer where appropriate. For example, project specifications may require:

- Management and recycling of construction wastes
- More stringent erosion controls
- Limitations on work hours and light pollution
- Limitations on truck idling
- Restoration of disturbed surfaces with specific plant species

- Dust monitoring and mitigation
- Avoiding potentially contaminated soils within designated brownfield sites.

Naturally, these additional restrictions and requirements bear additional cost. The City should discuss the costs and potential environmental benefits of these measures with the design engineer.

Construction Materials

Perhaps the most prevalent material to be used in the construction of the Waterbury Naugatuck Greenway will be pavement. Standard construction would specify bituminous concrete (asphalt) pavement as the surface treatment of choice. This material benefits from its wide availability and straightforward repair methods. Unfortunately, this material also tends to increase stormwater runoff and generate significant “heat island” effects. Alternatives are found in pervious (water permeable) concrete and pervious asphalt pavement. These variations of traditional concrete and asphalt mixes provide for stormwater infiltration and groundwater recharge. “Heat island” effects may be reduced by specifying materials with a high Solar Reflective Index (SRI). Material costs for permeable concrete pavement with a high SRI are approximately twice that of available asphalt. In some locations, granite stone dust may be the preferential treatment for the path. This is especially the case at the locations where a nature trail is recommended or locations where a more natural river environment is the prevailing context. Examples include the north end of the Greenway, adjacent to Thomaston Avenue, sections north of the Colonial Plaza shopping center and along Platts Mills Road. Stone dust also has the advantage of being a less expensive treatment in the short term, though it does require a somewhat higher annual maintenance budget than asphalt.

Timber portions of the trail system will require use of preserved wood. Over the last several years, less toxic wood preservatives have been developed. Copper Chromium Arsenate (CCA) is a common and effective wood preservative. Due to its toxicity, its use is restricted to certain applications with little risk of direct human contact. This preservative should be avoided. Alkaline copper quaternary (ACQ) was developed as a replacement for the more toxic CCA preservative. This should be considered the minimum acceptable preservative technology. Borate pressure treated lumber is generally considered to be the least toxic option, but it is not widely available.

In addition to specific preservative technologies, the City should consider specification of lumber certified by the Forest Stewardship Council (FSC).

The Waterbury Greenway is intended to be primarily a dawn to dusk facility. As such, its construction will not include a continuous underground power line along its entire length. It is possible that solar-powered LED lighting and a linear fiber-optic lighting strip could be integrated into the trail design. In strategic areas (trailheads, parking areas, roadway crossings, etc.), lighting will be necessary for public safety.

VI. Cost Estimate

Right-of-Way Acquisition Costs

Payments to owners for the easements and parcels required to construct the greenway vary widely depending up existing land use, size and utility of the portion of a parcel acquired, development potential of the area, and a host of other factors. Based upon recent greenway projects within Connecticut, these costs are likely to range between $2 million and $5 million. As discussed above, we recommend acquisition of easements rather than outright ownership where possible.

In addition to the payments to property owners, the services of a licensed surveyor will be needed during the ROW process. The survey firm will perform boundary surveys and prepare easement maps that must be recorded in the City's land records. These services typically cost $3,000 to $4,000 per easement. Note: this range assumes that easement maps are prepared after survey base maps of the proposed corridor are developed.

Finally, legal services will be needed to perform the property transactions. A relatively simple easement transaction will typically cost on the order of $1,500 per transaction if performed by outside counsel.

Based on the above, the total cost of right-of-way acquisition is expected to be in the range of $2.25 to $5.3 million.

Engineering Costs

Engineering costs cover a variety of professional services, including:

- Survey (including preparation of easement maps as described above)
- Preliminary, Semi-Final and Final Design
- Public Participation
- Permitting (Local, State and Federal as required)
- Preparation of Construction Documents
- Bid Assistance
- Construction Observation and Contract Administration

Based upon similar project experience and the proposed greenway features, the engineering costs for the greenway are expected to be in the range of $2.2 to $3 million. However, the actual cost of these services will vary widely depending on project phasing. To a large extent, the costs of permitting, preparing bid documents and administering the construction for a single phase is the same as the cost for the entire project. Similarly, survey and design are more cost effective if done at one time. For this reason, significant cost savings can be realized by developing the greenway as a single project.

Construction Costs

We have prepared preliminary estimates of construction costs based upon the recommended greenway alignment described in this report. Important assumptions used to arrive at these estimates include:

- All costs are in 2010 dollars (no adjustments for inflation)

- Costs do not include property acquisition
- Peripheral roadway intersection improvements are not included
- Standard construction methods and materials are used

In developing these cost estimates, we have relied upon our experience with similar greenway projects to select the construction materials with the best life-cycle cost/performance characteristics. Therefore, we have assumed aesthetically pleasing materials with a track record of durability and low maintenance requirements that can be constructed at reasonable cost.

The following table provides a summary of estimated costs for each of the recommended construction sections.

Table 4. Engineer's Order of Magnitude Opinion of Probable Construction Cost

Section #	Description	Total Cost
1	Thomaston Town Line to Huntingdon Avenue Section	$4,192,000
2	Huntingdon Avenue to Steele Brook Section	$3,576,000
3	Steele Brook to West Main Street Section	$4,127,000
4	Downtown Section	$2,174,000
5	Liberty Street to Eagle Street Bridge Section	$2,279,000
6	South Main Street and Platts Mills Road Section	$3,037,000
	Total Construction Cost - Primary Greenway Alignment	**$19,385,000**
	Total Construction Cost - Secondary Loops and Connections	**$3,996,000**

These estimates were prepared using the latest revisions to the Connecticut Department of Transportation's *Preliminary Cost Estimating Guidelines*, dated January, 2009. Where appropriate, adjustments to the typical unit prices were made to reflect current market conditions and our experience with other greenway construction projects. The guidelines were supplemented where necessary for atypical items (e.g., pre-fabricated pedestrian bridges, boat launches, etc.).

Since these preliminary estimates are based on a planning-level understanding of trail components, rather than on a detailed design, they should be considered "Order of Magnitude". ASTM Standard E2620 defines Order of Magnitude as being accurate to within plus 50% or minus 30%. This broad range of potential costs is appropriate given the level of uncertainty in the design at this point in the process. Many factors can affect final construction costs, including:

- Final construction phasing
- Revisions to the design as required by local, state and federal permitting agencies
- Additional requirements imposed by property owners as a condition of granting property rights (e.g., fencing, vegetated buffers, etc.)
- Fluctuations in commodity prices during the design and permitting processes
- Selected construction materials
- Type and quantity of amenities (e.g., benches, lighting, bike racks, etc.)
- Extent of landscaping desired

As the project progresses through preliminary, semi-final and final design phases, these uncertainties begin to diminish. With each round of refinement and range of expected construction costs will become more accurately known.

Table 5. More Detailed Estimated Costs by Section

Section #	Primary Greenway Sections		Unit Price
1	Thomaston Town Line to Huntingdon Avenue Section		
1	Shared-Use Off-Street	(start of Greenway)	$131,000
2	Shared-Use in ROW	(Thomaston Avenue)	$91,700
3	Shared-Use Off-Street	(at grade rail cross)	$903,900
4	Shared-Use in ROW	(Chase River Road)	$2,449,700
5	New Pedestrian Bridge Next to Exist Bridge*	(Huntingdon Avenue)	$458,500
B	Small Boat Launch	(1 required)	$13,100
P(S)	Parking (Small)	(2 required)	$78,600
Park(S)	Park (Small)	(assumed 1 required)	$65,500
		Section 1 sub-total	$4,192,000
2	Huntingdon Avenue to Steele Brook Section		
6	Shared-Use Off-Street	(between River and Route 8)	$196,500
9	Shared-Use Off-Street - path trestle	(south of Huntingdon Avenue between River and Route 8)	$2,502,100
10	New Ped Bridge Over River*	(new pedestrian bridge over river next to exist railroad bridge)	$877,700
		Section 2 sub-total	$3,576,300
3	Steele Brook to West Main Street Section		
12	Shared-Use Off-Street	(east of river)	$209,600
13-1	Shared-Use Off-Street - path trestle	(east of river)	$3,903,800
T	Pedestrian / Bike Trailhead	(one required)	$13,100
		Section 3 sub-total	$4,126,500
4	Downtown Section		
13-2	Shared-Use Off-Street	(heading east towards river off of Thomaston Ave)	$78,600
14	Shared-Use Off-Street - path trestle	(north of CL&P station)	$0
15	Shared-Use Off-Street - path trestle	(bypass of existing CL&P station)	$1,218,000
16	Shared-Use Off-Street	(south of Freight Street)	$681,200
T	Pedestrian / Bike Trailhead	(1 required)	$13,100
B	Small Boat Launch	(1 required)	$13,100
R	Rest Area	(1 required)	$13,100
P(L)	Parking (Large)	(1 required)	$78,600
Park(L)	Park (Large)	(assumed 1 required)	$78,600
		Section 4 sub-total	$2,174,300
5	Liberty Street to Eagle Street Bridge Section		
19	Shared-Use in ROW - vehicle/ trail	(within Jackson St underpass)	$157,200
20	Shared-Use Off-Street	(south of Liberty - approaching rail)	$65,500
21	New Pedestrian Bridge on Exist RR Bridge Abutments*	(south of Liberty - crossing over River)	$550,200
22	Shared-Use Off-Street	(north of Washington Avenue)	$262,000
23	Shared-Use in ROW	(starts at Washington Avenue)	$157,200
24	Shared-Use Off-Street	(along Railroad Hill Street)	$183,400
28	6' Walk - Cantilevered off of Eagle St bridge	(Eagle Street)	$903,900
		Section 5 sub-total	$2,279,400

6	South Main Street and Platts Mills Road Section		
29	Shared-Use in ROW - on ex pavement	(South Main Street)	$2,187,700
30	Unimproved Nature Trail	(between South Main Street and River)	$5,502
31	Shared-Use Off-Street	(towards Platts Mills Road around park)	$104,800
32	Unimproved Nature Trail	(trail adjacent to park and River)	$5,109
33	Shared-Use Off-Street	(Platts Mills Road to end of Greenway)	$379,900
T	Pedestrian / Bike Trailhead	(2 required)	$26,200
B	Small Boat Launch	(2 required)	$26,200
R	Rest Area	(1 required)	$13,100
P(L)	Parking (Large)	(1 required)	$183,400
P(S)	Parking (Small)	(1 required)	$39,300
Park(S)	Park (Small)	(assumed 1 required)	$65,500
		Section 6 sub-total	$3,036,711
	Total Construction Cost - Primary Greenway Alignment (Rounded)		**$19,385,000**

Table 6. Other Estimated Costs

#	Secondary Loops and Connections		Unit Price
7	Unimproved Nature Trail	(south of Huntingdon Avenue)	$13,100
8	New Covered Pedestrian Bridge Over River*	(south of Huntingdon Avenue and proposed park)	$799,100
11	Shared-Use Off-Street -under Rte.8	(toward Route 73)	$157,200
17	Shared-Use Off-Street	(towards east - across park -under Mixmaster)	$366,800
18	Shared-Use Off-Street	(north across park - toward Transportation Center)	$484,700
25	Rehab of Existing Rail Trestle	(heading east towards river off of Railroad Hill Street)	$419,200
26-1	Shared-Use Off-Street	(east side of river toward park)	$65,500
26-2	Shared-Use Off-Street	(east side of river toward park - south of Liberty Street)	$183,400
27-1	New Pedestrian Bridge*	(leads to proposed park - south of Washington Avenue)	$288,200
27-2	6' Walk - Cantilevered off Wash. St. bridge	(leads to proposed park - Washington Avenue)	$851,500
T	Pedestrian / Bike Trailhead	(1 required)	$13,100
B	Small Boat Launch	(1 required)	$13,100
R	Rest Area	(1 required)	$13,100
P(L)	Parking (Large)	(1 required)	$78,600
Park(L)	Park (Large)	(assumed 1 required)	$183,400
Park(S)	Park (Small)	(assumed 1 required)	$65,500
	Total Construction Cost - Secondary Loops and Connections (Rounded)		**$3,996,000**

The construction cost estimates discussed above assume that the trail will be constructed of bituminous concrete pavement. If the City wishes to use pervious pavement, total costs can be expected to increase by approximately $2.0 to $2.6 million.

**New bridge costs are rough estimates and can vary significantly depending on precise river bank conditions, span, materials, and other design considerations.*

Remediation Costs

As discussed under the environmental issues section above, acquisition of properties will likely be complicated by the presence of environmental contamination and the requirements to remediate the sites. Under current environmental law, liability for remediation accrues to the owner of the property and the entities that caused the release of harmful materials. Therefore, it is important to accurately determine and negotiate the remedial costs with current owners prior to acquiring the parcels. This is done through the Phase I/II/III Environmental Site Assessment process. In many cases, the cost of remediating a site will exceed the appraised value of the property. In such a situation, the City may agree to accept the responsibility for remediation costs in lieu of payments to the owner.

Remedial costs vary widely depending upon the nature and extent of the contamination, as well as the proposed development plan for the parcel. A common approach is to cap the contaminated portions of a site with a physical barrier that prevents exposure to the contaminants. A less common, and more costly, approach is to physically remove contaminated soil (i.e., soil, groundwater) and backfill with clean imported material. The range of expected costs for these two extremes is on the order of $350,000 to several million dollars per acre.

As discussed previously, the greenway should utilize easements where possible and should be designed to minimize generation of excess soil.

VII. Funding Sources

Generally, greenways are funded through a combination of local, state and federal sources. Many funding programs require a minimum local match (e.g., 80% federal funds, 20% local). In some instances communities have successfully leveraged grant money from private foundations or state programs as a match for other funding sources. In-kind technical support is also available from federal and state agencies, such as the National Park Service.

Greenway proponents should pursue a variety of funding sources for land acquisition and greenway construction. Reliance on a single funding source can lead to a boom/bust cycle of construction as funding levels shift with the political winds. The following list is an overview of the major funding programs.

Municipal Bonds

Municipalities have access to the commercial financial markets via bonds. Use of this funding mechanism is dependent upon strong community support in order to pass the required bond referendum. This is frequently used to obtain the required local matching funds.

Greenway Trust Fund

A strategy used by some communities is the creation of a trust fund for land acquisition and facility operation. These are typically administered by a nonprofit group or by a local greenway commission. These trusts can perform a variety of functions such as property acquisition, fund raising, volunteer organization, community outreach and advocacy. Money may be contributed to the trust fund from a variety of sources, including municipal funds, private grants and gifts.

Adopt-A-Trail Programs

These programs are often administered by a local greenway commission and are used to fund new construction, renovation, trail brochures, informational kiosks and other amenities. These programs can also be extended to include sponsorship of trail segments for maintenance needs.

Federal Transportation Funding

This federal transportation funding program currently known as SAFETEA-LU has been the primary source for recent greenway construction money. Various funding programs within the legislation relate to greenway development, including the High Priority Projects, Recreational Trails and Safe Routes to Schools programs. These funds are administered through the Connecticut DEP. In addition, Federal Transportation Enhancement Program (TEP) funds are administered locally by the Council of Governments of the Central Naugatuck Valley (COGCNV). COGCNV also develops the region's Transportation Improvements Program (TIP) and can provide technical assistance as the Greenway plan moves forward.

The existing SAFETEA-LU legislation expired on October 1, 2009 and a new transportation authorization bill is currently being considered by Congress. There is significant support to continue the existing bike/pedestrian/trail funding programs in the new bill. The legislative process presents an opportunity for Connecticut's congressional delegation to designate funds for the Waterbury Naugatuck River Greenway based upon the recommendations of this Routing and Feasibility Study.

Recreational Trails Program

These grants are available to government and non-profit agencies, for amounts ranging from $5,000 to $50,000, or more, for the building of a trail or piece of a trail. It is a reimbursement grant program (sponsor must fund 100% of the project up front) and requires a 20% local match, which can include an in-kind match. This is an annual program, with an application deadline at the end of January. The National Recreational Trails Grant Program requires a 20% local match, however, these funds themselves cannot be considered the "local match" for other potential grants mentioned above. In Connecticut these grants are administered by the Department of Environmental Protection.

State Funding

Other miscellaneous sources of funding are possible through the state of Connecticut. This includes state bonding, grants or funds through the Connecticut Community Foundation.

Design Arts Program

The National Endowment for the Arts provides grants to states and local agencies, individuals and nonprofit organizations for projects that incorporate urban design, historic preservation, planning, architecture, landscape architecture and other community improvement activities, including greenway development. Grants to organizations and agencies must be matched by a 50% local contribution. Agencies can receive up to $50,000.

Greenways Small Grant Program

This small grant program is funded by the state Greenway License Plate Fund. Awards of up to $5,000 are made annually to municipalities, regional planning agencies and non-governmental organizations. Eligible costs include the planning, design and implementing (not constructing) a greenway. Due to insufficient funding, no awards were made in 2009. This year's awards will be announced in June 2010.

Donations and In-Kind Matches

Donations of property, construction materials and labor can be a valuable source of greenway funding. The value of these resources is magnified when they are used as a local match for the Federal funding programs described above. The Federal Highway Administration has in the past approved "innovative financing plans" that include donation or in-kind labor performed by the greenway proponent or community organization. It should be noted that the approval of an innovative financing plan is done on a case-by-case basis by ConnDOT and FHWA, in light of community circumstances, and is not guaranteed.

Other Funding Sources

Other potential funding sources include donations of cash from private foundations and philanthropic organizations, such as the Connecticut Community Foundation and the United Way of Greater Waterbury's Emerging Needs Fund. Typically, these organizations have limited resources to share. However, these funds can be used to match Federal funds as described above.

VIII. Implementation

This section discusses aspects of the greenway routing study related to property acquisition for the proposed trail and describes the legal feasibility of the greenway in general terms. The proposed route will require a significant effort during the design development phase to create public access along the corridor, including the permitting processes required by multiple agencies and working cooperatively with landowners at a parcel-by-parcel level to create a publicly accessible right-of-way along the corridor. The framework for this process is outlined in the sections below.

Ownership Status

Parcels falling within the Waterbury Naugatuck River Greenway study area include a variety of ownership status and land uses, including:

- State, municipal and private ownership
- Industrial, commercial, residential, governmental and recreational use
- Highly developed urban environments and undeveloped open space
- Utilities

To assist with the visualization of the trail corridor and facilitate future outreach efforts, Appendix B of this report includes a table of properties affected by the greenway alignment and accompanying maps. Each map depicts a portion of the study area corridor proceeding from north to south with parcel labels that correspond to the property owners' table. The table presents map/block/lot numbers, land use, acreage and primary and secondary property owners' names and addresses.

Property Owners

The parcels directly affected by or adjacent to the recommended greenway alignment have been identified and listed in an electronic database provided as Appendix B in this report. The purpose of the database is to facilitate direct mailings to interested property owners and the Microsoft® Office Excel format will help to facilitate this.

It should be noted that the parcel database received from the City of Waterbury GIS staff was missing property owner data for several parcels. In addition, some of the parcels appear to have been assigned to an incorrect land use (e.g., the Waterbury Pollution Control Facility, parcel #782, is listed as "vacant land"). Where possible, the municipal GIS records have been supplemented with a cursory search of city assessor records. In some instances, however, this review did not reveal the current property owner. If more accurate data is required for these parcels, a systematic, lot-by-lot search of the City's land records will be required.

A total of 56 parcels have been identified as being affected by the recommended alignment. Of these, 15 lack a clear record of current property ownership. One of the parcels was donated to the City during the course or our study.

Title Search & Property Survey

As discussed below, future greenway development is likely to require acquisition of property rights to certain parcels of privately owned land. When properties are acquired by purchase or donation, the proponent agency will need to perform a title search in conjunction with the transaction. If the

proponent chooses to acquire property rights via easement or subdivision of an existing parcel, a boundary survey may also be required. In some cases, a permanent physical demarcation of the corners of the property (called “monumentation”) may also need to be established.

Property Acquisition

The following is a summary of the various ways which property can be obtained or utilized for the project. It is likely that all of these methods will be required in order to obtain contiguous access throughout the proposed corridor. Although all options may not be possible for each lot, the methods are listed below in order of most to least desirable.

The land acquisition phase of the project normally takes 18 to 24 months to complete (assuming that some partial takings will be required to complete the corridor).

Temporary vs. Permanent Property Rights

Construction of the proposed greenway will require the acquisition of both temporary and permanent property rights. Temporary rights provide a legal mechanism to enter upon private property for the purpose of design investigation, construction access, material staging, etc. Permanent rights are legally binding agreements, typically recorded on the municipality’s land records, which allow construction, maintenance, operation, and access to a facility such as a greenway.

A temporary right-of-entry release should be secured prior to visiting privately-owned properties along the proposed greenway alignment. Once executed, this document would give specific parties access to a certain parcel of land for a designated period of time. The document will be necessary for the design engineer to perform site investigations on privately-owned properties along the proposed greenway alignment.

Means of Acquiring Permanent Property Rights

Donations of Land

Donations of land can be given from a private property owner to the project proponent. Under this scenario, the private owner donates land to the project proponent for the project. Title to the property transfers from the owner to the project proponent. The property owner must be informed of their right to receive a written appraisal and just compensation for their property. The property owner must sign a statement waiving their right to compensation, in accordance with Connecticut DOT’s Rights-of-Way guidelines. As a contingency to the donation, a property owner may require that an appraisal be prepared, even if they waive their right to compensation. This is typically done for tax planning purposes.

If portions of property are donated, rather than complete lots of record, then care must be taken to avoid creation of a non-conforming lot. This may be accomplished through lot line revisions in most cases but sometimes requires subdivision, or re-subdivision of the parcel.

Fee Acquisition

Ownership in “fee simply” means the proponent agency (i.e., the City of Waterbury) owns the land and the greenway thereon. To use this option, the project proponent purchases the land from a private owner for an agreed-upon price. Fee acquisitions can be for entire parcels or portions thereof. If only a portion of a property is acquired, care must be taken to avoid creation of a non-conforming lot. This may

be accomplished through lot line revisions in most cases but sometimes requires subdivision, or re-subdivision of the parcel.

It's important to note that when the proponent acquires a parcel through either a purchase or donation, it also acquires potential environmental liability. Given the industrial heritage through much of the greenway corridor, this is an important consideration.

Easements

Another common form of acquiring property rights are easements. An easement is the right to use a defined portion of another party's land for a specific purpose. Usually easements are obtained by compensating the owner of the property in exchange for the easement. The original owner still owns the property, but it would now be subject to the rights of the grantee unto which the easement was conveyed. The specific terms of the easement rights would be defined in a legal document permanently recorded in the local land records for each property that would be affected along the proposed greenway alignment. In this case, the greenway could be built within an easement (or a series of easements from multiple owners), which would give the owner of the greenway the right to build, maintain, and operate the greenway through another party's land for a specified period of time. Compensation is typically a one-time payment. Easements are recorded on municipal land records and are normally transferable.

Lease Agreements

For sections of the greenway route that can utilize existing, publicly-owned properties (i.e., municipal, state or federal lands), the acquisition of rights or easements by a mutual agreement, "Memorandum of Understanding" or long-term lease may be negotiated.

Condemnation of Property

Condemnation of property is typically a last resort for obtaining property for a project. Under this process, property is appropriated for public use under the right of eminent domain. This is typically done if it is determined that it is a public necessity. Condemnation can be of an entire lot (i.e., a full taking), or a portion thereof (i.e., a partial taking). The owner is compensated for the property condemned based on a fair valuation.

Rights of Way Acquisition Process

The funding source of the construction project also affects the procedures utilized to secure property rights. The acquisition of rights-of-way for projects funded through Federal Highway Administration (FHWA) transportation enhancement monies are subject to the requirements of the Uniform Relocation and Real Property Acquisition Policies Act of 1970 (Uniform Act), as amended. In addition, specific procedures contained in a manual entitled "Information Guide for Rights of Way Acquisition Activities Bureau of Engineering and Highway Operations Office of Rights of Way Division of Administration", prepared in 2005 by the Connecticut Department of Transportation (ConnDOT), must be adhered to in the process of property acquisition if the project is state or federally funded. The Connecticut DOT provides specific procedures to be used for a variety of particular situations.

In cases where the City is able to acquire clear title to a property, (through donation or purchase) without using state or federal monies, it is not strictly required to follow the requirements of the Uniform Act. However, if these requirements are not followed and a property acquisition is later challenged, the Federal Highway Administration will hold funding until the matter is resolved. For this reason, it is advisable to use Uniform Act procedures in all purchases. Acquisition through condemnation

involves additional legal requirements. Competent legal council should be consulted if this method is used.

Permitting Process

The construction of this project will require permits from various agencies. A brief description of each anticipated permit is provided below. It should be noted that each permit may not be required for each phase of construction.

City of Waterbury Inland Wetlands and Watercourses Permit for Regulated Activities

Basis: Delegated authority from the state based on Connecticut General Statutes.

Threshold: Any regulated activity within a state regulated wetland, or upland review area. Can also be required if the activity is in an upland area, drains to a regulated wetland area, and/or is deemed to have a potential impact on the wetland.

Process: Application must be made to the City and most include a Connecticut Department of Environmental Protection (CTDEP) Reporting Form. At the first meeting after application is received, it is formally accepted by the Commission. This begins the time periods as defined in the State Statues. There must be a finding of potential significance. If the proposed activity is deemed to be a potentially significant activity, then a public hearing must be held before a decision can be made by the Commission. If the activity is found to have no significant impact, then the Commission may hold a public hearing, if it is found to be in the public good, or may render a decision without holding a hearing. Following the formal publication of the decision, there is a 15-day appeal period.

Time Line: Normally takes three to six months, depending on whether a public hearing is required. Application must be submitted not later than the day of the Planning and Zoning Permit, if required.

City of Waterbury Planning and Zoning Site Permit

Basis: Local authority granted under Connecticut General Statutes, but based on local bylaws and regulations.

Threshold: Any significant earthwork or work requiring a building permit. A zoning permit may not be required for this project. This should be discussed with City staff once the corridor and proposed construction methods are sufficiently defined.

Process: Application is made to the City of Waterbury. At the first meeting after the application is received, it is formally accepted by the Commission. This begins the time periods as defined in the State Statues and local bylaws. Certain activities require a special permit which requires a public hearing and must be held before a decision can be made by the Commission. Also, the Commission cannot make a decision until the Inland Wetlands Commission has made a decision. Following the formal publication of the decision, there is a 15-day appeal period. Plans must normally be approximately 70% construction document level in order to contain sufficient information to gain approvals.

Time Line: Normally takes three to six months, following submission, depending on whether a public hearing is required. Cannot be submitted prior to the application for inland wetlands, although they can be submitted on the same day.

FEMA Conditional Letter of Map Revision (CLOMR)

Basis: Federal law with some review authority delegated to the City.

Threshold: Any earthwork or construction within a designated flood plain; work over, or in a designated floodway.

Process: Application is made to FEMA with the concurrence of the City. The application must demonstrate that the water surface elevation is not increased by proposed activities through modeling using HEC-RAS software. Following construction, application must be made for a Letter of Map Revision (LOMR) depicting actual "as-built" conditions and modeling demonstrating that no increase in water surface elevations will result.

Time Line: Normally takes 12 to 18 months for CLOMR.

Stream Channel Encroachment Permit

Basis: State regulation of specific stream channels as defined by Connecticut General Statutes and CTDEP Regulations.

Threshold: Any earthwork within the stream channel encroachment line.

Process: Application is made to CTDEP. Application must include hydrologic analysis proving that activity does not negatively impact flood water or impede flow within the channel.

Time Line: Normally takes six to 12 months depending upon the nature of the proposed construction.

Connecticut Department of Environmental Protection (CTDEP) General Permit for the Discharge of Stormwater and Dewatering Wastewater from Construction Activities

Basis: Connecticut General Statutes and CTDEP Regulations.

Threshold: Compliance with the General Permit is required for all projects that disturb one or more acres of total land area. Projects with five or more total acres of disturbance, regardless of phase must also file a registration with the CTDEP. Projects exceeding 10 acres of total disturbance must obtain an approval of registration, including a detailed review of the required Stormwater Pollution Control Plan. The current re-authorization of the General Permit expires on April 1, 2010. The CTDEP has discussed lowering the threshold for registration to one acre as part of the next re-authorization.

Process: Application is made to DEP.

Time Line: Must be submitted at least 60 days prior to the start of construction.

Army Corps of Engineers (ACOE) Permit

Basis: Federal statutes.

Threshold: There are three categories of ACOE permits based on the total area of disturbance of federally regulated wetlands. The federal definition of wetland is different from the Connecticut definition. Although the limits of both federal and state wetland tend to be the same, there are sometimes differences. ACOE jurisdiction is triggered by any fill-in, or secondary impact to, a federally regulated wetland. If the ACOE has jurisdiction, then the category of permit is decided based on the total direct and secondary impacts to

wetlands. Direct impacts include earthwork operations. Secondary impacts can include changes in drainage patterns or groundwater hydrology, clearing/cutting of vegetation, or alteration of shade patterns.

Category I — General Permit (less than 5,000 square feet of disturbance)

Category II — Programmatic General Permit (PGP) (5,000 square feet to one acre of disturbance)

Category III — Individual Permit (one acre, or more, of disturbance)

Process: For Category I, there is no application required. For Category II and III permits, application is made to the ACOE. Review is conducted jointly by the ACOE and CTDEP (see CT 401 Water Quality Permit). Additional review by the U.S. Fish and Wildlife and other federal agencies is conducted for Category II and III permits. Category II permits can be changed to Category III if requested by reviewing agencies based on potential impacts of the wetlands or wildlife habitat.

Time Line: Category II permits normally take six to nine months depending on complexity, quality/function of wetlands, and surrounding habitats. Category III can take one year or more. Category II and III permits cannot be granted until the CT DEP issues a 401 Water Quality Permit.

Connecticut 401 Water Quality Permit

Basis: Federal authority, under the Clean Waters Act, delegated to the State of Connecticut.

Threshold: Category II or III ACOE Permit, or any State of Connecticut Project.

Process: Application to ACOE is jointly reviewed by the Connecticut Department of Environmental Protection. The CTDEP often requires additional information to be submitted which is not required by the ACOE.

Time Line: Normally takes four to six months. Must be granted before the ACOE can issue a Category II or III permit.

National Environmental Policy Act (NEPA) Review

Upon receipt of federal funding for the project through FHWA, the Connecticut DOT's Office of Environmental Planning will review the project for applicability of a "Categorical Exclusion" to the requirements of the National Environmental Policy Act (NEPA). This review will include an analysis of the project's impacts in the following areas:

- Noise
- Air Quality
- Biological Diversity
- Endangered Species
- Wetlands
- Floodplains
- Prime Farmland
- Land Use
- Surface & Groundwater Resources
- Hazardous Materials
- Section 4(f) & 6(f)
- Visual/Aesthetics
- Environmental Justice
- Socio-economic
- Historic & Archaeological (Section 106)
- Indirect & Cumulative Impacts

- Energy Impacts
- Construction Impact
- Scenic Roads

The review is initiated automatically by the Connecticut DOT and the City will be notified of the results. The Categorical Exclusion report will indicate which specific items covered by NEPA require additional evaluation. Greenways typically qualify for a categorical exclusion and only limited additional evaluation may be needed.

Project Implementation

The recommended alignment of the Waterbury Naugatuck River Greenway should be viewed as one complete project. The desired outcomes of the greenway development will not be fully realized until the project is complete. In addition, significant cost savings can be realized by designing, permitting and constructing the greenway as a single project. For these reasons we recommend the trail be developed, if possible, as a single phase.

However, it is possible that financial constraints will require the Greenway to be completed in several sections, as funding becomes available. If this is the case, the criteria below can be used to evaluate the six defined sections of the Greenway in order to create an implementation strategy.

Connectivity – Individual sections should serve a logical purpose. For example, a residential neighborhood connection to an employment center is preferable to a segment that terminates in a wooded area or undeveloped land.

Funding Availability – The complete greenway program can be developed as a series of reasonably-sized projects likely to attract funding.

Momentum Building – Construction sections likely to generate the greatest excitement and enthusiasm in the community should be built first.

Logical Termini – Since several years may pass between the completion of one section and the beginning of the next, each section should have a logical terminus.

If a phasing strategy is ultimately developed, the Greenway corridor will need to be built in manageable sections that can be implemented with more modest budgets. The cost estimates for each of the six sections range from $2.1 million to $4.1 million and are shown in Table 7 at the end of this section in the report.

For the length of the Greenway, running from the Thomaston line downriver, the six sections include:

Thomaston Town Line to Huntingdon Avenue Section

This section includes the trail component from the Thomaston Town Line to the underpass below Huntingdon Avenue. In addition, rehabilitation of an existing steel truss bridge adjacent to the WIC site and revitalization of a public access fishing area will be undertaken. The rehabilitated bridge will also provide access to public lands and an unimproved trail network on the western side of the river.

Huntingdon Avenue to Steele Brook Section

A large portion of the trail implementation will include an elevated portion raised up on piles in this section. It also includes a potential new open space on the scrap yard site on the east bank as well as a new signature bridge to connect the primary trail with the new park space.

Steele Brook to West Main Street Section

This section will resume the Greenway's progression and provide a link to Watertown's proposed Steele Brook Greenway. Prominent components also include the proposed West Main Street Underpass and a new pedestrian/bike bridge adjacent to an existing rail trestle.

Downtown Section

The downtown section extends from West Main Street to the proposed Jackson Street park space and the Bank Street crossing. It also includes improved connections to downtown and the Green along Freight Street, as well as new connections to the potential future Waterbury Transportation Center. We anticipate that the proposed future reconstruction of the I-84/Route 8 interchange will include additional cross-connections between the Transportation Center and the Greenway. However, given the uncertain schedule of that project, we have recommended interim connections via a short "Rails with Trails" segment between Liberty Street and the train station. At Liberty Street and Bank, the greenway will connect through a parcel recommended for trail-oriented redevelopment.

Extension of the greenway north of West Main Street will involve developing a trail underpass of this congested roadway. However, an interim at-grade connection is recommended if the Downtown Section is developed on a different timeline than the section immediately to the north.

Liberty Street to Eagle Street Bridge Section

Although this section is a relatively short segment of the Greenway, it will provide a key connection for residential neighborhoods in southeastern Waterbury to the downtown area. The section also includes development of a side trail and neighborhood park south of Washington Avenue, but not the loop on the east bank through the Anamet site which could be funded separately and is considered a "secondary loop" for the purposes of the cost estimate.

South Main Street and Platts Mills Road Section

This section will involve lane reductions along the South Main Street right-of-way. At Platts Mills Road, the greenway will terminate at the Naugatuck Borough Line and two short segments of nature trails and a proposed park are included. In addition to providing the connection point for the regional trail system, this section will improve connections to the residential neighborhoods in southern Waterbury.

Project Section Cost Estimate

Table 7. Engineer's Order of Magnitude Opinion of Probable Construction Cost

Section #	Description	Total Cost
1	Thomaston Town Line to Huntingdon Avenue Section	$4,192,000
2	Huntingdon Avenue to Steele Brook Section	$3,576,000
3	Steele Brook to West Main Street Section	$4,127,000
4	Downtown Section	$2,174,000
5	Liberty Street to Eagle Street Bridge Section	$2,279,000
6	South Main Street and Platts Mills Road Section	$3,037,000
	Total Construction Cost - Primary Greenway Alignment	**$19,385,000**
	Total Construction Cost - Secondary Loops and Connections	**$3,996,000**

Project Schedule

Every greenway project is unique. However, in the event that the Waterbury Greenway project is not able to be funded as a single construction project and must be phased by section, a general schedule for the implementation of a single phase/section can be seen by looking at "typical" timeframes for the various processes that the projects must go through. These timeframes are generally consistent, regardless of the size of a particular project. Therefore, significant streamlining occurs when various phases of construction are consolidated into larger projects. The general schedule presented below is based on experience with similar greenway projects. Since some of these processes occur simultaneously, the times listed are not cumulative. Items considered to be on the "critical path" are shown in the second column from the right.

Table 8. Project TImeline

Process	Description	Critical Path Tasks (months)	Concurrent Tasks (months)
RFQ	Request for Qualifications and Consultant Selection	3	
Contracting	Contracting between the City and the Consultant	2	
Survey	Detailed survey of the project area	2	
PD	Preliminary Design of the Project	3	
PD Review	Review of Preliminary Designs by ConnDOT and City	3	
Permits	Application for local, state and federal permits		18
ROW	Rights of Way Acquisition	18	
FD	Final Design of the Project		2
FD Review	Review of Preliminary Designs by ConnDOT and City		1
CD	Preparation of Construction Documents	2	
Bid	Soliciting public Bids for the project	2	
Contracting	Contracting between the City and the Construction contractor	1	
Construction	Construction of the greenway	8-18	
Total time for one phase/section of construction:		**44-54 Months**	

Operations and Maintenance

The operations of the Waterbury Naugatuck River Greenway Trail should be integrated and operated as seamlessly as possible, offering citizens and visitors a first-class system. Coordination and cost-effective management and function are essential. To help achieve a sustainable operations program, the following actions are suggested:

- Local agencies should work together with a written "Owner's Manual" including a specific listing of all functions, frequency of tasks, and quality standards. This should be translated into an annual budget that anticipates build-out in five-year increments.
- The program must be cost-effective with sustainable funding sources identified.
- The community should continue the Greenway Advisory Committee to serve as long term liaison/advocate for the greenway.
- The program should have a discrete and adequate funding allocation for the trail system based on the program manual and annual budget.
- A lead person, with trails development and management skills should be designated who will have management authority over the trail. A "contract" should be established with the appropriate departments and/or outside private contractors as appropriate to carry out the various operations, management, and programming functions.
- The lead person should also work cooperatively with other department heads, non-profit and private-sector partners, and agency staff to assure a coordinated effort amongst all of the alternative modes including: shared-use paths, sidewalks, on-street bicycling, and transit services.

Guiding Principles for an Effective Operations Program

The following guiding principles will help assure the preservation of a first class system:

- Good maintenance begins with sound planning and design.
- Foremost, protect life, property, and the environment.
- Promote and maintain a quality transportation and recreation experience.
- Develop a management plan that is reviewed and updated annually with tasks, operational policies, standards, and routine and remedial maintenance goals.
- Maintain quality control and conduct regular inspections.
- Include field crews, police, and fire/rescue personnel in both the design review and on-going management process.
- Maintain an effective, responsive public feedback system and promote public participation.

With the full build-out of the trail, annual operations and programming could include the following responsibilities and tasks:

- Special events planning
- Volunteer coordination
- Environmental education/stewardship
- Outreach programming
- Program development
- Safe Routes to Schools coordination
- Health and fitness coordination

- Trail patrol coordination
- Trail patrol staff/volunteers
- System engineering/planning

The quality and condition of a shared-use path is essential to the long-term success of the project. *System Maintenance* refers to the care, upkeep, and smooth functioning of shared-use paths. If the facility is well maintained and cared for, it will assure both the safety and enjoyment of the residents and visitors who use it. A proper maintenance program will reduce long-term costs by extending the life of the components and it will also win the continued support of residents, homeowners and businesses.

Typical annual maintenance includes:

- Sweeping of the path after the spring snow pack melts
- Shoulder mowing and sweeping operations
- Periodic maintenance and repairs -including seal coating of path surfaces (approximately every four to five years on a rotating basis) striping, signage, benches, bike racks, and installation of safety fencing, safety signage, and devices, etc.
- Bridge maintenance
- Trash removal
- Tree and vegetation trimming
- Crack sealing and repair

Facilities Maintenance

The trail maintenance program should maintain the following elements:

- Off-Street Shared-Use Pathways
- Natural Surface / Single Track Mountain Bike Trails (part of a future integrated system)
- Trail-Related Landscapes (landscaped and open space areas associated with trails and greenways including streams and conservation areas)
- On-Street Bicycle Facilities (bike lanes, bike routes, and streets used for bicycling)
- Trailheads
- Sidewalks
- Wayfinding Signage, Fixtures and Furnishings (on-street and off-street)
- Regulatory and Safety Signage
- Tunnels, Pedestrian Bridges, Underpasses, and At-Grade Street Crossings
- Trail-Related Parks and Features
- Access Parking and Maintenance Roads
- Rest Areas

It should be noted that the greenway trail will not be plowed, groomed or maintained for cross-country skiing during the winter season unless specific maintenance funding is provided beyond currently available municipal resources. During mild winters, there is likely to be significant use of the trail when conditions allow.

IX. Design Guidelines

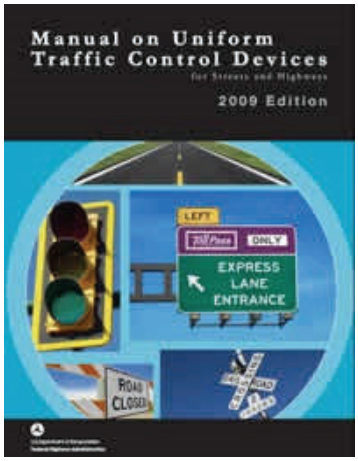
At the State and National levels, there are existing guidelines that apply to shared-use paths, and pedestrian and bicycle facilities. While these documents are not absolute standards, many public agencies require projects to meet the guidelines as a minimum condition for key dimensions including slope, horizontal and vertical clearances, and surface condition, signage, and pavement markings. In addition, all applicable local design and construction standards will be followed. The key documents published by The American Association of State Highway and Transportation Officials (AASHTO), the U.S. Department of Transportation (USDOT), and others include:

AASHTO Guidelines for the Development of Bicycle Facilities

The most recent version of this nationally recognized document is the 3rd Edition, dated 1999. The update is due to be released in 2010. The guide is described by AASHTO as follows:

"The guide is designed to provide information on the development of facilities to enhance and encourage safe bicycle travel. The majority of bicycling will take place on ordinary roads with no dedicated space for bicyclists. Bicyclists can be expected to ride on almost all roadways as well as separated shared-use paths and even sidewalks, where permitted to meet special conditions. This guide provides information to help accommodate bicycle traffic in most riding environments. It is not intended to set forth strict standards, but, rather, to present sound guidelines that will be valuable in attaining good design sensitive to the needs of both bicyclists and other highway users."

Manual on Uniform Traffic Control Devices (MUTCD)



The 2009 Federal MUTCD includes Part 9: Traffic Controls for Bicycle Facilities, along with detailed guidelines for pedestrian facilities crossings available, and is available on-line at: http://mutcd.fhwa.dot.gov/kno_2009.htm.

Connecticut State Department of Transportation (ConnDOT)

In Connecticut, the new Bicycle and Pedestrian Master Plan is in draft form and pending release by ConnDOT. Design guidelines required by the state in addition to the AASHTO guide and MUTCD will be integrated into the design of the Waterbury Naugatuck River Greenway.

Universal Design/ADA Access

Good universal design for the Waterbury Greenway trail will ensure access for everyone no matter their physical abilities. In addition, all greenway paths and other trails that receive funding from state or federal sources must conform to Americans with Disabilities Act (ADA) guidelines. The Federal Highway Administration publishes a guidebook entitled *Designing Sidewalks and Trails for Access*. Chapter 5, Trail Design for Access is the most relevant portion of the report and is available on-line at: http://www.fhwa.dot.gov/environment/sidewalks/chap5a.htm

Water Trail Design Guidelines

The Waterbury Greenway will include a designated Water Trail to accommodate the growing interest in the use of small paddlecraft—kayaks and canoes—to experience the Naugatuck River. To assist with designing this important element within the greenway, the *Water Trail Toolbox: How to Plan, Build and Manage a Water Trail*, published by the non-profit, Chesapeake Bay Gateways Network should be consulted. This report offers step-by-step guidelines for planning, building and managing water trails and can be found on-line at:

http://www.baygateways.net/watertrailtools.cfm

Context Sensitive Design Elements

The following list illustrates the key elements that will make the Waterbury Naugatuck River Greenway an integral part of the Waterbury community:

Interpretive Installations

Interpretive installations and signs enhance the trail experience by providing information about the history of the community. Installations can also discuss local ecology, environmental concerns and other educational information. Public health can be integrated with 'calorie counter' maps that encourage physical activity along the trail.

Drinking Fountains and Bicycle Parking

Water fountains provide water for people (and pets, in some cases) and bicycle racks allow trail users to safely park their bikes if they wish to stop along the way, particularly at parks and other desirable destinations.

Pedestrian-Scale Lighting and Furniture

Pedestrian-scale lighting improves safety and enables the trail to be used year-round. It also enhances the aesthetic of the trail. Lighting fixtures should be consistent with other design elements, possibly emulating a historic or cultural theme.

Providing benches and seating at key rest areas and viewpoints encourages people of all ages to use the trail by ensuring that they have a place to rest along the way. Benches can be simple (e.g., wood timbers) or more ornate (e.g., stone, wrought iron, concrete, or Adirondack chairs).

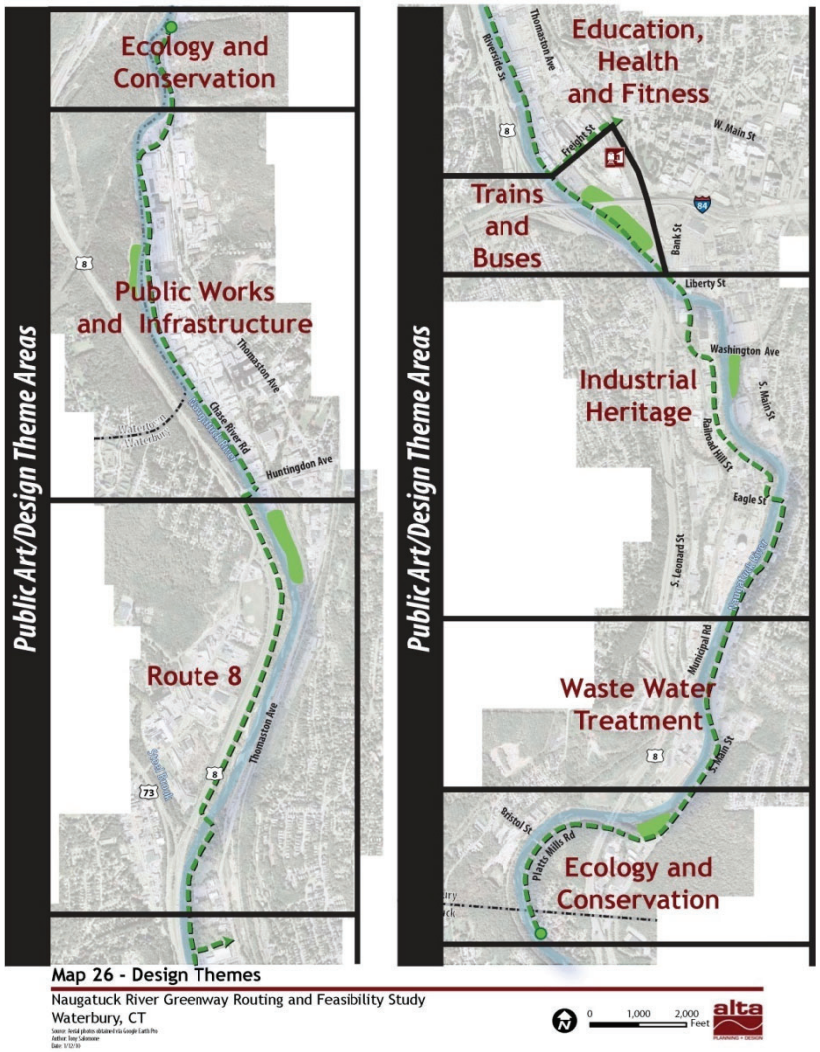
Maps and Signage

A comprehensive signing system makes a trail network easy to use. Informational kiosks with maps at trailheads and other destinations can provide enough information for someone to use the trail system with little introduction – perfect for both tourists and local citizens.

Public Art

Local artists can be commissioned to provide art for the trail system, making the trail unique to its community. Many trail art installations are functional as well as aesthetic, as they may serve as mile markers and places to sit and play. Public art installations along the greenway should be consistent with a design theme, based on the surrounding context. The map below illustrates the theme areas recommended for the entire seven-mile alignment.

Map 26. Design Themes Diagram

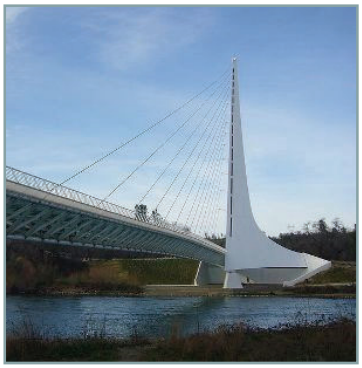


Design Innovation

Design Principles

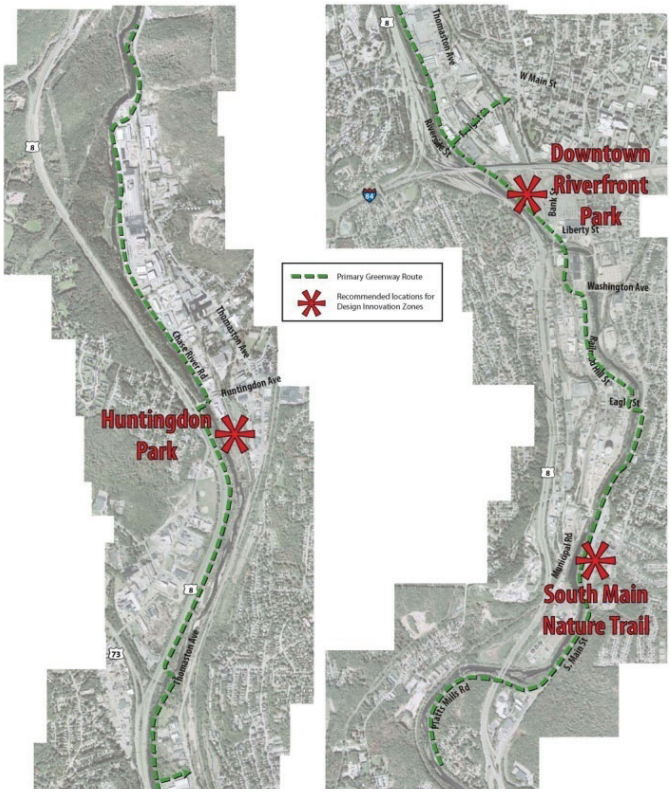
The Waterbury Naugatuck River Greenway will be a seven mile long signature feature that re-defines the City's landscape. The Greenway will have an innovative design that symbolizes Waterbury's future and it will move through clearly defined context-sensitive design zones that are themed to represent the City's culture, heritage and environment. This vision can be thought of in a similar way to Christo's linear sculpture The Gates, which created an iconic visual experience through the landscape of Central Park, or Calatrava's Sundial Bridge that became a new symbol for the Sacramento River in Redding, CA.

The Gates project in Central Park in 2005



Sundial Bridge in Reading California (from the University of California Berkeley website, class syllabus for Architecture 140 course)

Map 27. Design Innovation Zones



Key elements of these Design Principles will include:

The Trail: the trail surface will be designed with best practices for bike/pedestrian design, incorporating appropriate features for safety and quality of experience. The trail surface will be 'green' through the use of recycled / environmentally friendly materials, surface color and texture. The trail will be clearly visible as a linear ribbon through the community.

A ribbon-like seating element follows one of the trails in Tanghe River Park in China (source: www.Turenscape.com).

The Tanghe River Park Ribbon in Winter (source: www.Turenscape.com)

The High Line project in Manhattan uses sustainably-harvested wood planks and native grasses and other plants to create a highly textured pathway.

Structural Elements: in cantilevered and pier-supported sections, structural elements of the trail will be visually unique, representative of the City's industrial heritage and capable of pre-fabrication / replication along the corridor.

The High Line incorporates old railroad ties and rails (bottom right) to connect the project to its industrial heritage.

In San Mateo, California, a wetland area is spanned with an intricately detailed structure (source: http://mishalov.com/mill-union-bike-16may05/)

Bridges: each bridge will have both a unique design and common elements that relate to the Greenway as a whole, with variations on the themes for each zone within the corridor. The bridges are a key design opportunity to create symbolic visual icons that are functional elements of the project.

The proposed signature pedestrian-bike bridge connecting the primary greenway trail with the potential new park just south of Huntingdon Avenue can include a variety of options, including:

a more innovative covered bridge;

a unique sculptural structure;

an arch bridge;

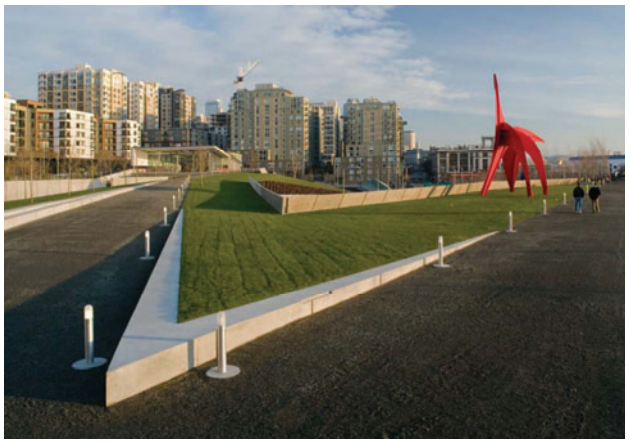
a suspension bridge.

The Vlaardingse Vaart Bridge in Holland offers a unique crossing experience for those on bike or foot (source: www.west8.nl).

Amenities: mile markers, railings, wayfinding signage, benches, lighting, public art, bike racks, recycling bins and other furnishings will all be integrated elements of the design. Solar and wind energy, sustainability and human power will be utilized in these elements.

Jackson Street railroad trestle existing conditions

Unique lighting will be incorporated into the trail design at the Design Innovation Zones such as at the Jackson Street underpass.



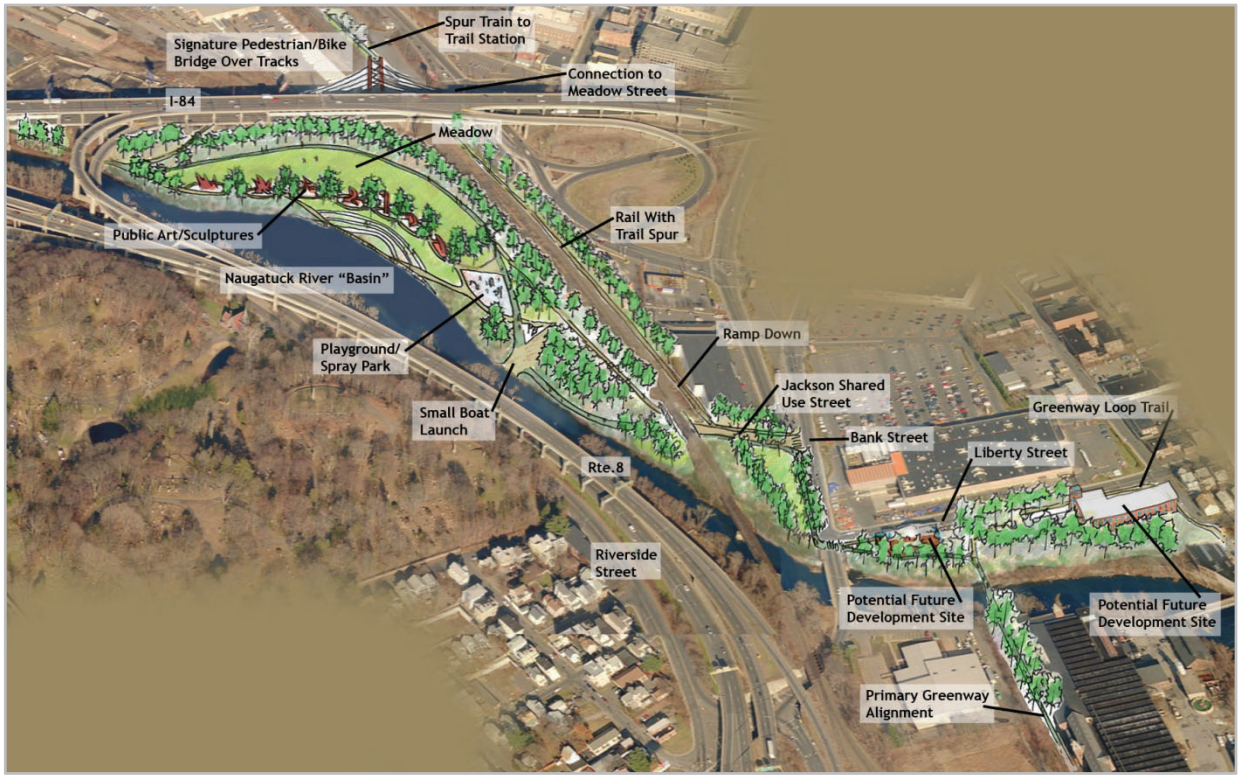
Large-scale public art has been used extensively at Olympic Sculpture Park in Seattle (source: www.topboxdesign.com).

Amenities along the Waterbury Greenway will include unique seating kiosks such as those along Promenade Samuel de-Champlain in Quebec City (source: http://archrecord.construction.com/projects/portfolio/archives/0907promenade-1.asp).

Landscape: the human, urban and river habitats will be connected through the landscape architecture of the greenway as a sustainable model of the relationships between the built and natural environments.

The undulating path enhances the shoreline at Promenade Samuel de-Champlain in Quebec City (source: http://archrecord.construction.com/projects/portfolio/archives/0907promenade-1.asp).

At the Buffalo Bayou Promenade in Houston, the path meanders below and through the structural columns of the interstate highway above (source: www.swagroup.com).



Aerial view of the new downtown riverfront park adjacent to the Mixmaster and the "trail-oriented development" projects on the other side of Bank Street

X. Action Plan and Next Steps

Creating the Waterbury Naugatuck River Greenway project will take sustained effort with many partners. In order to advance the project, the following 'next steps' are recommended:

- **Initiate the Design Phase:** The Waterbury Naugatuck River Greenway has been approved for federal funding. Upon approval of this Study, the project is ready to be advanced to the next phase, which will be the development of detailed design and contract documents that will lead to bidding and construction. The key will be to get this process to happen quickly to maintain the momentum created by this Study.
- **Create the Right-of-Way:** This will ensure that the proposed alignment for the trail is assembled and is made available for public access. This will involve keeping an eye open for opportunities, such as the upcoming Route 8/I-84 interchange project, integration of a greenway Overlay District for redevelopment opportunities, or acquisition of riverfront lands by the city (such as the WIC property). The Overlay District in particular can be a powerful tool for the City to require that trail facilities are integrated into redevelopment projects and also to help shape the quality of the development by ensuring that compatible uses are provided along the Greenway. The majority of the formal right-of-way acquisition process will take place during the design development phase of the project, but that process will be more effective if there is an ongoing effort throughout the corridor.
- **"Early Win" Projects:** Support and action at the local level will grow out of small successes that move the project forward. Neighborhood cleanups and 'adoption' of future trail sections can help build long-term support. Frequent ribbon cuttings, festivals and events create long term visibility for the project. Celebrating every opportunity, no matter how small, can be just as important as a major ribbon cutting for the finished project. Local organizations and agencies can be involved in creating sections of the trail that can be linked over time into the overall concept.
- **Fundraising and Grant Writing:** There are a variety of funding sources available for projects like the Waterbury Naugatuck River Greenway, and all available opportunities should be pursued, including federal transportation funds, regional TIP funding (via COGCNV), active living/health initiatives, energy grants, economic stimulus funding, environmental restoration funds and other sources. Engaging the region's state and federal elected officials is an ongoing process that is essential for success.
- **Create a Maintenance Endowment:** Many successful trails establish a fund for ongoing operation and maintenance. Starting this effort at the beginning of a trail project will help sustain the effort in the future. This is also an item that a local philanthropy, corporation or individuals can contribute to.
- **Public-Private-Non-Profit Partnership:** Establish a "Friends of the NRG" non-profit organization to advocate for the project, and keep the Greenway Advisory Committee and other agencies involved in advancing the project. This non-profit organization can coordinate volunteers, develop an 'adopt-a-mile' program and raise funds through the sale of trail elements including benches, bridges, trailheads, public art, bike racks and trees.

With these actions moving forward, the Waterbury Naugatuck River Greenway will be a significant asset for the City's residents, businesses and visitors and bring a tremendous element of recreational and transportation infrastructure to the entire community.

Appendix A – Detailed Cost Estimate

Section #	Primary Greenway Sections		Unit Price
1	Thomaston Town Line to Huntingdon Avenue Section		
1	Shared-Use Off-Street	(start of Greenway)	$131,000
2	Shared-Use in ROW	(Thomaston Avenue)	$91,700
3	Shared-Use Off-Street	(at grade rail cross)	$903,900
4	Shared-Use in ROW	(Chase River Road)	$2,449,700
5	New Pedestrian Bridge Next to Exist Bridge*	(Huntingdon Avenue)	$458,500
B	Small Boat Launch	(1 required)	$13,100
P(S)	Parking (Small)	(2 required)	$78,600
Park(S)	Park (Small)	(assumed 1 required)	$65,500
		Section 1 sub-total	$4,192,000
2	Huntingdon Avenue to Steele Brook Section		
6	Shared-Use Off-Street	(between River and Route 8)	$196,500
9	Shared-Use Off-Street - path trestle	(south of Huntingdon Avenue between River and Route 8)	$2,502,100
10	New Ped Bridge Over River*	(new pedestrian bridge over river next to exist railroad bridge)	$877,700
		Section 2 sub-total	$3,576,300
3	Steele Brook to West Main Street Section		
12	Shared-Use Off-Street	(east of river)	$209,600
13-1	Shared-Use Off-Street - path trestle	(east of river)	$3,903,800
T	Pedestrian / Bike Trailhead	(one required)	$13,100
		Section 3 sub-total	$4,126,500
4	Downtown Section		
13-2	Shared-Use Off-Street	(heading east towards river off of Thomaston Ave)	$78,600
14	Shared-Use Off-Street - path trestle	(north of CL&P station)	$0
15	Shared-Use Off-Street - path trestle	(bypass of existing CL&P station)	$1,218,000
16	Shared-Use Off-Street	(south of Freight Street)	$681,200
T	Pedestrian / Bike Trailhead	(1 required)	$13,100
B	Small Boat Launch	(1 required)	$13,100
R	Rest Area	(1 required)	$13,100
P(L)	Parking (Large)	(1 required)	$78,600
Park(L)	Park (Large)	(assumed 1 required)	$78,600
		Section 4 sub-total	$2,174,300
5	Liberty Street to Eagle Street Bridge Section		
19	Shared-Use in ROW - vehicle/ trail	(within Jackson St underpass)	$157,200
20	Shared-Use Off-Street	(south of Liberty - approaching rail)	$65,500
21	New Pedestrian Bridge on Exist RR Bridge Abutments*	(south of Liberty - crossing over River)	$550,200
22	Shared-Use Off-Street	(north of Washington Avenue)	$262,000
23	Shared-Use in ROW	(starts at Washington Avenue)	$157,200
24	Shared-Use Off-Street	(along Railroad Hill Street)	$183,400
28	6' Walk - Cantilevered off of Eagle St bridge	(Eagle Street)	$903,900
		Section 5 sub-total	$2,279,400
6	South Main Street and Platts Mills Road Section		
29	Shared-Use in ROW - on ex pavement	(South Main Street)	$2,187,700

30	Unimproved Nature Trail	(between South Main Street and River)	$5,502
31	Shared-Use Off-Street	(towards Platts Mills Road around park)	$104,800
32	Unimproved Nature Trail	(trail adjacent to park and River)	$5,109
33	Shared-Use Off-Street	(Platts Mills Road to end of Greenway)	$379,900
T	Pedestrian / Bike Trailhead	(2 required)	$26,200
B	Small Boat Launch	(2 required)	$26,200
R	Rest Area	(1 required)	$13,100
P(L)	Parking (Large)	(1 required)	$183,400
P(S)	Parking (Small)	(1 required)	$39,300
Park(S)	Park (Small)	(assumed 1 required)	$65,500
		Section 6 sub-total	$3,036,711
		Total Construction Cost – Primary Greenway Alignment (Rounded)	**$19,385,000**

#	Secondary Loops and Connections		Unit Price
7	Unimproved Nature Trail	(south of Huntingdon Avenue)	$13,100
8	New Covered Pedestrian Bridge Over River*	(south of Huntingdon Avenue and proposed park)	$799,100
11	Shared-Use Off-Street -under Rte.8	(toward Route 73)	$157,200
17	Shared-Use Off-Street	(towards east - across park -under Mixmaster)	$366,800
18	Shared-Use Off-Street	(north across park - toward Transportation Center)	$484,700
25	Rehab of Existing Rail Trestle	(heading east towards river off of Railroad Hill Street)	$419,200
26-1	Shared-Use Off-Street	(east side of river toward park)	$65,500
26-2	Shared-Use Off-Street	(east side of river toward park - south of Liberty Street)	$183,400
27-1	New Pedestrian Bridge*	(leads to proposed park - south of Washington Avenue)	$288,200
27-2	6' Walk - Cantilevered off Wash. St. bridge	(leads to proposed park - Washington Avenue)	$851,500
T	Pedestrian / Bike Trailhead	(1 required)	$13,100
B	Small Boat Launch	(1 required)	$13,100
R	Rest Area	(1 required)	$13,100
P(L)	Parking (Large)	(1 required)	$78,600
Park(L)	Park (Large)	(assumed 1 required)	$183,400
Park(S)	Park (Small)	(assumed 1 required)	$65,500
	Total Construction Cost – Secondary Loops and Connections (Rounded)		**$3,996,000**

The construction cost estimates discussed above assume that the trail will be constructed of bituminous concrete pavement. If the City wishes to use pervious pavement, total costs can be expected to increase by approximately $2.0 to $2.6 million.

**New bridge costs are rough estimates and can vary significantly depending on precise river bank conditions, span, materials, and other misc. design considerations*

Primary and Secondary Greenway Element Details			
#	Segment	Approx. Length	Description
START OF GREENWAY (North)			
1	Shared-Use Off-Street	1,490	10' width - paved walk between Thomaston Ave and River - no support required
2	Shared-Use in ROW	1,080	10' width - along Thomaston Avenue
3	Shared-Use Off-Street	3,240	10' width -no rail - at grade crossing over rail near DPW complex - train warning lights/gates required
4	Shared-Use in ROW	4,980	10' width - no rail - Chase River Rd - 20 utility poles Includes cost of Huntingdon Avenue greenway underpass
5	New Pedestrian Bridge Next to Exist Bridge	250	10' wide walk along south side of bridge - use existing bridge abutments which have extra width enough to support new pedestrian bridge (no piers/abutments required)
6	Shared-Use Off-Street	2,230	10' wide paved path along river adjacent to proposed park - south of Huntingdon Avenue
7	Unimproved Nature Trail	2,370	10' wide clearing and grubbing along proposed park (parallel to #6)
8	New Covered Pedestrian Bridge Over River	400	10' wide covered pedestrian bridge next to existing old railroad bridge - new abutment and piers
9	Shared-Use Off-Street - path trestle	4,860	10' wide paved path along river - will need support on river bank for walk - possible retaining wall - no pile supports
10	New Pedestrian Bridge Next to Exist RR Bridge	540	12' wide new prefabricated pedestrian bridge adjacent to existing old railroad bridge
11	Shared-Use Off-Street -under Rt.8	1,800	10' wide paved path under Route 8 - along Steele Brook
12	Shared-Use Off-Street	2,490	10' width - no rail - along river - between river and Thomaston Avenue
13-1	Shared-Use Off-Street – Path Trestle	2,820	10' wide - adjacent to service alley behind businesses - opposite side of guard rail over embankment - needs support - possible pile support with cantilever section - 8 utility poles Includes cost of West Main Street Greenway underpass
13-2	Shared-Use Off-Street	950	10' wide - no rail - path extension off of #13-1 to the east towards river
14	Shared-Use Off-Street – Path Trestle	970	10' wide paved path - along river embankment - no support required
15	Shared-Use Off-Street	290	10' wide - adjacent to CL&P complex - needs support to get around complex building - possible pile support with cantilever section
16	Shared-Use Off-Street	4,550	10' wide - paved along river - no support required - adjacent to proposed park - under Mixmaster Includes 1,500 LF of on-street trail along Freight Street.
17	Shared-Use Off-Street	1,020	10' wide - paved section off of #15 - across park - under Mixmaster Includes elevated timber rail crossing
18	Shared-Use Off-Street	1,220	10' wide - paved section off of #15 - across park towards proposed Intermodal Transportation Center - under Mixmaster Includes elevated timber rail crossing
19	Shared-Use in ROW - vehicle/ trail	550	Shared vehicle / trail use within Liberty Underpass
20	Shared-Use Off-Street	750	10' wide - paved along river - no support required - adjacent to proposed park - south of Liberty Street - under Bank Street
21	New Pedestrian Bridge on Exist RR Bridge Abutments	190	12' wide - new prefab pedestrian bridge- use existing piers and abutments

22	Shared-Use Off-Street	930	10' wide - paved walk adjacent to existing rail
23	Shared-Use in ROW	1,360	10' wide paved - adjacent to road - begins along Washington Avenue - 6 utility poles
24	Shared-Use Off-Street	2,130	10' wide - paved along river - no support required - east of Railroad Hill Street (may need support as approaches Eagle Street - approx 70 ft)
25	Rehab of Existing Rail Trestle	300	10' Width - existing deck and structures to remain (use ex piers and abutment) - requires maintenance and rehab of deck - use deck for walk - add rails - across the river off of #24
26	Shared-Use Off-Street	740	10' wide - paved along river - no support required - east of Railroad Hill Street - opposite side of river as #24
27	New Pedestrian Bridge	200	10' wide pedestrian bridge - new structure with cover - new abutment and piers - #26 to proposed park
28	6' Walk - Cantilevered off of Eagle St bridge	210	6' wide - cantilevered walk off of existing structure - may need new pile support off extended deck - located north of walk on Eagle Street Bridge
29	Shared-Use in ROW - on existing pavement	7,080	10' wide walk - on existing pavement - along South Main Street - fast traveling road - remove traffic lane (road diet) consideration for pedestrian protection - 32 utility poles
30	Unimproved Nature Trail	1,110	10' wide clearing and grubbing - located between river and South Main - off of #29
31	Shared-Use Off-Street	1,150	10' wide - paved adjacent to proposed park - off of South Main
32	Unimproved Nature Trail	1,020	10' wide clearing and grubbing - located between proposed park and river and South Main - nature trail connecting #29 to #33
33	Shared-Use Off-Street	4,130	10' wide - paved along river - no support required - between Platts Mills Road and river - crosses under Route 8 - 3 utility poles
END OF GREENWAY (South)			
	TOTAL LENGTH:	63,180	feet
		12	miles

	Misc Items	Number Required	Description
T	Pedestrian / Bike Trailhead	4	Informational Kiosk with maps/branding
B	Small Boat Launch	3	Walk-in / Walk-out launch for canoes and kayaks
P(L)	Parking (Large)	2	20 stalls - 8000 SF
P(S)	Parking (Small)	1	10 stalls - 4200 SF
TC	Transportation Center	1	Various connections to Transportation Center
Park(L)	Park / Open Space (Large)	2	Includes existing auto salvage yard and I-84/Route 8 Interchange area
Park(S)	Park / Open Space (Small)	3	Includes WIC area, Washington Avenue and corner of South Main and Platts Mills property

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **1,490** Feet as shown on the plans

#1

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	1,490	LF	$14.00	$20,860
processed aggregate	1,490	LF	$17.00	$25,330
superpave	1,490	LF	$20.00	$29,800
Contract Items			**SUBTOTAL**	$76,000
Clearing and Grubbing Roadway		5.0%		$3,800
M & P of Traffic		1.5%		$1,100
Mobilization		7.5%		$5,700
Construction Staking		1.0%		$800
Minor Items (Applied to Roadway Items only)		20.0%		$11,000
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$100,000
INCIDENTALS		21.0%		$21,000
CONTINGENCIES		10%		$10,000
			TOTAL ESTIMATED COST	**$131,000**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **.**
Depth: **12"**
Type: **Shared-Use in ROW**
From Sta:
To Sta:
A length of **1,080** Feet as shown on the plans

#2

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	1,080	LF	$14.00	$15,120
processed aggregate	1,080	LF	$17.00	$18,360
superpave	1,080	LF	$20.00	$21,600
Contract Items			**SUBTOTAL**	$55,100
Clearing and Grubbing Roadway		5.0%		$2,800
M & P of Traffic		1.5%		$800
Mobilization		7.5%		$4,100
Construction Staking		1.0%		$600
Minor Items (Applied to Roadway Items only)		20.0%		$8,000
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$70,000
INCIDENTALS		21.0%		$14,700
CONTINGENCIES		10%		$7,000
			TOTAL ESTIMATED COST	**$91,700**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **3,240** Feet as shown on the plans

#3
Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	3,240	LF	$14.00	$45,360
processed aggregate	3,240	LF	$17.00	$55,080
superpave	3,240	LF	$20.00	$64,800
modular block retaining walls (750 LF x 4' average height)	3,000	SF	$60.00	$180,000
granular fill (for ret wall support)	1,600	CY	$55.00	$88,000
Railroad/pedestrian warning devices	1	EA	$100,000.00	$100,000
Contract Items			**SUBTOTAL**	$533,200
Clearing and Grubbing Roadway		5.0%		$26,700
M & P of Traffic		1.5%		$8,000
Mobilization		7.5%		$40,000
Construction Staking		1.0%		$5,300
Minor Items (Applied to Roadway Items only)		20.0%		$77,600
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$690,000
INCIDENTALS		21.0%		$144,900
CONTINGENCIES		10%		$69,000
			CURRENT COST TOTAL	**$903,900**
Inflation				
Inflation Factor (6% per year)		0	YR	$0
			TOTAL ESTIMATED COST	**$903,900**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use in ROW**
From Sta:
To Sta:
A length of **4,980** Feet as shown on the plans

#4
Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	4,980	LF	$14.00	$69,720
processed aggregate	4,980	LF	$17.00	$84,660
superpave	4,980	LF	$20.00	$99,600
utility pole relocation	20	EA	$5,000.00	$100,000
Crane	1	LS	$25,000.00	$25,000
underpass deck	650	LF	$1,500.00	$975,000
underpass conc (for pier / abutt)	1	LS	$25,000.00	$25,000
underpass rail	1,300	LF	$125.00	$162,500
Driving Steel Piles	2,000	LF	$25.00	$50,000
Contract Items			**SUBTOTAL**	$1,591,500
Clearing and Grubbing Roadway		5.0%		$79,600
M & P of Traffic		1.5%		$23,900
Mobilization		7.5%		$119,400
Construction Staking		1.0%		$15,900
Minor Items (Applied to Roadway Items only)		20.0%		$36,900
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$1,870,000
INCIDENTALS		21.0%		$392,700
CONTINGENCIES		10%		$187,000
			TOTAL ESTIMATED COST	**$2,449,700**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **12'**
Depth:
Type: **New Ped Bridge Next to Exist Bridge**
From Sta:
To Sta:
A length of **160** Feet as shown on the plans

#5

Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Concrete for attaching to Pier / Abuttment	4	EA	$5,000.00	$20,000
steel bearings	4	EA	$500.00	$2,000
pre-fabricated ped steel truss bridge [1]	160	LF	$1,800.00	$288,000
Timber Boardwalk	0	LF	$0.00	$0
Crane	1	LS	$8,000.00	$8,000
Contract Items			**SUBTOTAL**	$318,000
Clearing and Grubbing Roadway		0.0%		$0
M & P of Traffic		1.5%		$4,800
Mobilization		7.5%		$23,900
Construction Staking		1.0%		$3,200
Minor Items (Applied to Roadway Items only)		0.0%		$0
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$350,000
INCIDENTALS		21.0%		$73,500
CONTINGENCIES		10%		$35,000
			TOTAL ESTIMATED COST	**$458,500**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

Notes

1) Cost for bridge may vary widely based on selected materials, structure width, span between supports, etc. This estimate assumes a 10' clear width pre-fabricated steel truss bridge, with synthetic lumber decking and a clear span of 160 feet.

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **2,230** Feet as shown on the plans

#6

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	2,230	LF	$14.00	$31,220
processed aggregate	2,230	LF	$17.00	$37,910
superpave	2,230	LF	$20.00	$44,600
Contract Items			**SUBTOTAL**	$113,700
Clearing and Grubbing Roadway		5.0%		$5,700
M & P of Traffic		1.5%		$1,700
Mobilization		7.5%		$8,500
Construction Staking		1.0%		$1,100
Minor Items (Applied to Roadway Items only)		20.0%		$16,500
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$150,000
INCIDENTALS		21.0%		$31,500
CONTINGENCIES		10%		$15,000
			TOTAL ESTIMATED COST	**$196,500**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth:
Type: **Unimproved Nature Trail**
From Sta:
To Sta:
A length of **2,370** Feet as shown on the plans

#7

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
clearing and grubbing	2,370	LF	$3.00	$7,110
Contract Items			**SUBTOTAL**	$7,100
M & P of Traffic		1.5%		$100
Mobilization		7.5%		$500
Construction Staking		1.0%		$100
Minor Items (Applied to Roadway Items only)		20.0%		$1,400
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$10,000
INCIDENTALS		21.0%		$2,100
CONTINGENCIES		10%		$1,000
			TOTAL ESTIMATED COST	**$13,100**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **12'**
Depth:
Type: **New Covered Ped Bridge Over River**
From Sta:
To Sta:
A length of **140** Feet as shown on the plans

#8

Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Class A Conc (piers / abutt)	4	EA	$25,000.00	$100,000
steel bearings	0	EA	$0.00	$0
Covered Timber Truss Bridge [1]	140	LF	$2,800.00	$392,000
water handling	1	LS	$20,000.00	$20,000
Deformed Steel Bars	0	LF	$0.00	$0
Timber Boardwalk	0	LF	$0.00	$0
earth excavation	0	LF	$0.00	$0
granular fill (for bridge pier/abutt)	0	EA	$0.00	$0
pervious structural backfill	0	EA	$0.00	$0
Driving Steel Piles	0	LF	$0.00	$0
Crane	1	LS	$50,000.00	$50,000
Contract Items			**SUBTOTAL**	$562,000
Clearing and Grubbing Roadway		0.0%		$0
M & P of Traffic		0.0%		$0
Mobilization		7.5%		$42,200
Construction Staking		1.0%		$5,600
Minor Items (Applied to Roadway Items only)		0.0%		$0
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$610,000
INCIDENTALS		21.0%		$128,100
CONTINGENCIES		10%		$61,000
			TOTAL ESTIMATED COST	**$799,100**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

Notes

1) Cost for bridge may vary widely based on selected materials, structure width, span between supports, etc. This estimate assumes a 10' clear width, pre-fabricated timber truss covered bridge, with timber decking and a clear span of 140 feet.

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street - path trestle**
From Sta:
To Sta:
A length of **4,860** Feet as shown on the plans

#9

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	4,860	LF	$14.00	$68,040
processed aggregate	4,860	LF	$17.00	$82,620
superpave	4,860	LF	$20.00	$97,200
granular fill (for ret wall support)	4,860	LF	$66.00	$320,760
pervious backfill (for wall)	4,860	LF	$4.00	$19,440
retaining wall earth excavation	4,860	LF	$5.00	$24,300
modular retaining wall	4,860	LF	$210.00	$1,020,600
Contract Items			**SUBTOTAL**	$1,633,000
Clearing and Grubbing Roadway		5.0%		$81,700
M & P of Traffic		1.5%		$24,500
Mobilization		7.5%		$122,500
Construction Staking		1.0%		$16,300
Minor Items (Applied to Roadway Items only)		20.0%		$36,000
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$1,910,000
INCIDENTALS		21.0%		$401,100
CONTINGENCIES		10%		$191,000
		TOTAL ESTIMATED COST		**$2,502,100**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **20' and walk**
Depth:
Type: **New Ped Bridge Next to Exist RR Brid**
From Sta:
To Sta:
A length of **540** Feet as shown on the plans

#10

Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Class A Conc (piers / abutt)	5	EA	$25,000.00	$125,000
steel bearings	0	EA	$0.00	$0
Prestressed Beams	0	LF	$0.00	$0
water handling	1	LS	$20,000.00	$20,000
Deformed Steel Bars	0	LF	$0.00	$0
Timber Rails (20')	0	LF	$0.00	$0
pre-fabricated ped steel truss bridge [1]	270	LF	$1,500.00	$405,000
Driving Steel Piles	800	LF	$25.00	$20,000
Crane	1	LS	$50,000.00	$50,000
Contract Items			**SUBTOTAL**	$620,000
Clearing and Grubbing Roadway		0.0%		$0
M & P of Traffic		0.0%		$0
Mobilization		7.5%		$46,500
Construction Staking		1.0%		$6,200
Minor Items (Applied to Roadway Items only)		0.0%		$0
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$670,000
INCIDENTALS		21.0%		$140,700
CONTINGENCIES		10%		$67,000
		TOTAL ESTIMATED COST		**$877,700**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

Notes

1) Cost for bridge may vary widely based on selected materials, structure width, span between supports, etc. This estimate assumes a 10' clear width pre-fabricated steel truss bridge, with synthetic lumber decking and a maximum clear span of 80 feet. A total of 4 seperate spans comprise the 270' overall length.

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street -under Rt.8**
From Sta:
To Sta:
A length of **1,800** Feet as shown on the plans

#11
Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	1,800	LF	$14.00	$25,200
processed aggregate	1,800	LF	$17.00	$30,600
superpave	1,800	LF	$20.00	$36,000
Contract Items			**SUBTOTAL**	$91,800
Clearing and Grubbing Roadway		5.0%		$4,600
M & P of Traffic		1.5%		$1,400
Mobilization		7.5%		$6,900
Construction Staking		1.0%		$900
Minor Items (Applied to Roadway Items only)		20.0%		$13,300
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$120,000
INCIDENTALS		21.0%		$25,200
CONTINGENCIES		10%		$12,000
			TOTAL ESTIMATED COST	**$157,200**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **2,490** Feet as shown on the plans

#12
Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	2,490	LF	$14.00	$34,860
processed aggregate	2,490	LF	$17.00	$42,330
superpave	2,490	LF	$20.00	$49,800
Contract Items			**SUBTOTAL**	$127,000
Clearing and Grubbing Roadway		5.0%		$6,400
M & P of Traffic		1.5%		$1,900
Mobilization		7.5%		$9,500
Construction Staking		1.0%		$1,300
Minor Items (Applied to Roadway Items only)		20.0%		$18,400
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$160,000
INCIDENTALS		21.0%		$33,600
CONTINGENCIES		10%		$16,000
			TOTAL ESTIMATED COST	**$209,600**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **2,820** Feet as shown on the plans

#13-1

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	800	LF	$14.00	$11,200
processed aggregate	800	LF	$17.00	$13,600
superpave	800	LF	$20.00	$16,000
Class A Conc Slab	2,000	LF	$400.00	$800,000
Class A Conc (piers / abutt)	400	EA	$1,000.00	$400,000
Crane	1	LS	$25,000.00	$25,000
underpass deck	650	LF	$1,500.00	$975,000
underpass conc (for pier / abutt)	1	LS	$25,000.00	$25,000
underpass rail	1,300	LF	$125.00	$162,500
Driving Steel Piles	2,000	LF	$25.00	$50,000
Contract Items			**SUBTOTAL**	$2,478,300
Clearing and Grubbing Roadway		5.0%		$123,900
M & P of Traffic		1.5%		$37,200
Mobilization		7.5%		$185,900
Construction Staking		1.0%		$24,800
Minor Items (Applied to Roadway Items only)		10.0%		$126,580
		CURRENT COST TOTAL		**$3,903,800**
Inflation				
Inflation Factor (6% per year)		0	YR	$0
		TOTAL ESTIMATED COST		**$3,903,800**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **950** Feet as shown on the plans

#13-2

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	950	LF	$14.00	$13,300
processed aggregate	950	LF	$17.00	$16,150
superpave	950	LF	$20.00	$19,000
Contract Items			**SUBTOTAL**	$48,500
Clearing and Grubbing Roadway		5.0%		$2,400
M & P of Traffic		1.5%		$700
Mobilization		7.5%		$3,600
Construction Staking		1.0%		$500
Minor Items (Applied to Roadway Items only)		20.0%		$7,000
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$60,000
INCIDENTALS		21.0%		$12,600
CONTINGENCIES		10%		$6,000
		TOTAL ESTIMATED COST		**$78,600**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **970** Feet as shown on the plans

#14

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	970	LF	$14.00	$13,580
processed aggregate	970	LF	$17.00	$16,490
superpave	970	LF	$20.00	$19,400
Contract Items			**SUBTOTAL**	$49,500
Clearing and Grubbing Roadway		5.0%		$2,500
M & P of Traffic		1.5%		$700
Mobilization		7.5%		$3,700
Construction Staking		1.0%		$500
Minor Items (Applied to Roadway Items only)		20.0%		$7,200
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$60,000
INCIDENTALS		21.0%		$12,600
CONTINGENCIES		10%		$6,000
			TOTAL ESTIMATED COST	**$78,600**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **1,510** Feet as shown on the plans

#15

Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation		LF	$14.00	$0
processed aggregate		LF	$17.00	$0
superpave		LF	$20.00	$0
Class A Conc Slab	1,510	LF	$400.00	$604,000
Class A Conc (piers / abutt)	150	EA	$1,000.00	$150,000
water handling	1	LS	$20,000.00	$20,000
Crane	1	LS	$20,000.00	$20,000
Contract Items			**SUBTOTAL**	$794,000
Clearing and Grubbing Roadway		5.0%		$39,700
M & P of Traffic		1.5%		$11,900
Mobilization		7.5%		$59,600
Construction Staking		1.0%		$7,900
Minor Items (Applied to Roadway Items only)		10.0%		$20,000
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$930,000
INCIDENTALS		21.0%		$195,300
CONTINGENCIES		10%		$93,000
			TOTAL ESTIMATED COST	**$1,218,300**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **4,300** Feet as shown on the plans

#16

Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	4,300	LF	$14.00	$60,200
processed aggregate	4,300	LF	$17.00	$73,100
superpave	4,300	LF	$20.00	$86,000
pedestrian warning signal	1	EA	$100,000.00	$100,000
utility pole relocation	15	EA	$5,000.00	$75,000
Contract Items			**SUBTOTAL**	$394,300
Clearing and Grubbing Roadway		5.0%		$19,700
M & P of Traffic		1.5%		$5,900
Mobilization		7.5%		$29,600
Construction Staking		1.0%		$3,900
Minor Items (Applied to Roadway Items only)		20.0%		$66,800
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$520,000
INCIDENTALS		21.0%		$109,200
CONTINGENCIES		10%		$52,000
			TOTAL ESTIMATED COST	**$681,200**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

Notes
1) Assumes this cost paid out of construction funds and is not completed at the expense of the Utility.

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **1,200** Feet as shown on the plans

#17

Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	1,200	LF	$14.00	$16,800
processed aggregate	1,200	LF	$17.00	$20,400
superpave	1,200	LF	$20.00	$24,000
Elevated timber rail crossing, including approach ramps	1	LS	$150,000.00	$150,000
Contract Items			**SUBTOTAL**	$211,200
Clearing and Grubbing Roadway		5.0%		$10,600
M & P of Traffic		1.5%		$3,200
Mobilization		7.5%		$15,800
Construction Staking		1.0%		$2,100
Minor Items (Applied to Roadway Items only)		20.0%		$38,900
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$280,000
INCIDENTALS		21.0%		$58,800
CONTINGENCIES		10%		$28,000
			TOTAL ESTIMATED COST	**$366,800**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Rails with Trails**
From Sta:
To Sta:
A length of **1,500** Feet as shown on the plans

#18
Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	1,500	LF	$14.00	$21,000
processed aggregate	1,500	LF	$17.00	$25,500
superpave	1,500	LF	$20.00	$30,000
Railroad security fencing	1,500	LF	$35.00	$52,500
Ramp from Jackson Street to Rail elevation, including overpass	1	LS	$150,000.00	$150,000
Contract Items			**SUBTOTAL**	$279,000
Clearing and Grubbing Roadway		5.0%		$14,000
M & P of Traffic		1.5%		$4,200
Mobilization		7.5%		$20,900
Construction Staking		1.0%		$2,800
Minor Items (Applied to Roadway Items only)		20.0%		$51,600
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$370,000
INCIDENTALS		21.0%		$77,700
CONTINGENCIES		10%		$37,000
		TOTAL ESTIMATED COST		**$484,700**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use in ROW - vehicle/ trail**
From Sta:
To Sta:
A length of **550** Feet as shown on the plans

#19
Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	550	LF	$14.00	$7,700
Steel-Backed Timber Guide Rail	550	LF	$125.00	$68,750
processed aggregate	550	LF	$17.00	$9,350
superpave	550	LF	$20.00	$11,000
Contract Items			**SUBTOTAL**	$96,800
Clearing and Grubbing Roadway		5.0%		$4,800
M & P of Traffic		1.5%		$1,500
Mobilization		7.5%		$7,300
Construction Staking		1.0%		$1,000
Minor Items (Applied to Roadway Items only)		20.0%		$4,100
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$120,000
INCIDENTALS		21.0%		$25,200
CONTINGENCIES		10%		$12,000
		TOTAL ESTIMATED COST		**$157,200**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **750** Feet as shown on the plans

#20

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	750	LF	$14.00	$10,500
processed aggregate	750	LF	$17.00	$12,750
superpave	750	LF	$20.00	$15,000
Contract Items			**SUBTOTAL**	$38,300
Clearing and Grubbing Roadway		5.0%		$1,900
M & P of Traffic		1.5%		$600
Mobilization		7.5%		$2,900
Construction Staking		1.0%		$400
Minor Items (Applied to Roadway Items only)		20.0%		$5,600
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$50,000
INCIDENTALS		21.0%		$10,500
CONTINGENCIES		10%		$5,000
		TOTAL ESTIMATED COST		**$65,500**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **12'**
Depth:
Type: **New Ped Bridge on Exist RR Bridge Al**
From Sta:
To Sta:
A length of **160** Feet as shown on the plans

#21

Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Concrete for attaching to Pier / Abuttment	4	EA	$5,000.00	$20,000
steel bearings	4	EA	$500.00	$2,000
pre-fabricated ped steel truss bridge	160	LF	$1,500.00	$240,000
Timber Boardwalk		LF		$0
Crane	1	LS	$50,000.00	$50,000
Contract Items			**SUBTOTAL**	$312,000
Clearing and Grubbing Roadway		5.0%		$15,600
M & P of Traffic		1.5%		$4,700
Mobilization		7.5%		$23,400
Construction Staking		1.0%		$3,100
Minor Items (Applied to Roadway Items only)		20.0%		$62,400
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$420,000
INCIDENTALS		21.0%		$88,200
CONTINGENCIES		10%		$42,000
		TOTAL ESTIMATED COST		**$550,200**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

Notes

1) Cost for bridge may vary widely based on selected materials, structure width, span between supports, etc. This estimate assumes a 10' clear width pre-fabricated steel truss bridge, with synthetic lumber decking and a maximum clear span of 60 feet. A total of 3 seperate spans comprise the 160' overall length.

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **930** Feet as shown on the plans

#22

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	930	LF	$14.00	$13,020
Steel-Backed Timber Guide Rail	930	LF	$125.00	$116,250
processed aggregate	930	LF	$17.00	$15,810
superpave	930	LF	$20.00	$18,600
Contract Items			**SUBTOTAL**	$163,700
Clearing and Grubbing Roadway		5.0%		$8,200
M & P of Traffic		1.5%		$2,500
Mobilization		7.5%		$12,300
Construction Staking		1.0%		$1,600
Minor Items (Applied to Roadway Items only)		20.0%		$6,900
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$200,000
INCIDENTALS		21.0%		$42,000
CONTINGENCIES		10%		$20,000
			TOTAL ESTIMATED COST	**$262,000**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use in ROW**
From Sta:
To Sta:
A length of **1,360** Feet as shown on the plans

#23

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	1,360	LF	$14.00	$19,040
processed aggregate	1,360	LF	$17.00	$23,120
superpave	1,360	LF	$20.00	$27,200
utility pole relocation	6	EA	$5,000.00	$30,000
Contract Items			**SUBTOTAL**	$99,400
Clearing and Grubbing Roadway		5.0%		$5,000
M & P of Traffic		1.5%		$1,500
Mobilization		7.5%		$7,500
Construction Staking		1.0%		$1,000
Minor Items (Applied to Roadway Items only)		20.0%		$10,100
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$120,000
INCIDENTALS		21.0%		$25,200
CONTINGENCIES		10%		$12,000
			TOTAL ESTIMATED COST	**$157,200**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **2,130** Feet as shown on the plans

#24
Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	2,130	LF	$14.00	$29,820
processed aggregate	2,130	LF	$17.00	$36,210
superpave	2,130	LF	$20.00	$42,600
Contract Items			**SUBTOTAL**	$108,600
Clearing and Grubbing Roadway		5.0%		$5,400
M & P of Traffic		1.5%		$1,600
Mobilization		7.5%		$8,100
Construction Staking		1.0%		$1,100
Minor Items (Applied to Roadway Items only)		20.0%		$15,800
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$140,000
INCIDENTALS		21.0%		$29,400
CONTINGENCIES		10%		$14,000
		TOTAL ESTIMATED COST		**$183,400**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **12'**
Depth:
Type: **Rehab of Existing Rail Trestle**
From Sta:
To Sta:
A length of **300** Feet as shown on the plans

#25
Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Steel-Backed Timber Guide Rail	0	LS	$0.00	$0
Bridge Rehab	300	LF	$960.00	$288,000
Crane	1	LS	$8,000.00	$8,000
Contract Items			**SUBTOTAL**	$296,000
Clearing and Grubbing Roadway		0.0%		$0
M & P of Traffic		0.0%		$0
Mobilization		7.5%		$22,200
Construction Staking		1.0%		$3,000
Minor Items (Applied to Roadway Items only)		0.0%		$0
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$320,000
INCIDENTALS		21.0%		$67,200
CONTINGENCIES		10%		$32,000
		TOTAL ESTIMATED COST		**$419,200**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **740** Feet as shown on the plans

#26-1
Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	740	LF	$14.00	$10,360
processed aggregate	740	LF	$17.00	$12,580
superpave	740	LF	$20.00	$14,800
Contract Items			**SUBTOTAL**	$37,700
Clearing and Grubbing Roadway		5.0%		$1,900
M & P of Traffic		1.5%		$600
Mobilization		7.5%		$2,800
Construction Staking		1.0%		$400
Minor Items (Applied to Roadway Items only)		20.0%		$5,500
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$50,000
INCIDENTALS		21.0%		$10,500
CONTINGENCIES		10%		$5,000
		TOTAL ESTIMATED COST		**$65,500**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **2,180** Feet as shown on the plans

#26-2
Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	2,180	LF	$14.00	$30,520
processed aggregate	2,180	LF	$17.00	$37,060
superpave	2,180	LF	$20.00	$43,600
Contract Items			**SUBTOTAL**	$111,200
Clearing and Grubbing Roadway		5.0%		$5,600
M & P of Traffic		1.5%		$1,700
Mobilization		7.5%		$8,300
Construction Staking		1.0%		$1,100
Minor Items (Applied to Roadway Items only)		20.0%		$16,100
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$140,000
INCIDENTALS		21.0%		$29,400
CONTINGENCIES		10%		$14,000
		TOTAL ESTIMATED COST		**$183,400**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **12'**
Depth:
Type: **New Ped Bridge**
From Sta:
To Sta:
A length of **80** Feet as shown on the plans

#27-1

Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Class A Conc (piers / abutt)	3	EA	$15,000.00	$45,000
steel bearings		EA	$500.00	$0
pre-fabricated ped steel truss bridge	80	LF	$1,500.00	$120,000
water handling	1	LS	$20,000.00	$20,000
Deformed Steel Bars		LF	$100.00	$0
Timber Boardwalk		LF	$560.00	$0
earth excavation		LF	$7.00	$0
granular fill (for bridge pier/abutt)		EA	$330.00	$0
pervious structural backfill		EA	$448.00	$0
Driving Steel Piles		LF	$25.00	$0
Crane	1	LS	$10,000.00	$10,000
Contract Items			**SUBTOTAL**	$195,000
Clearing and Grubbing Roadway		5.0%		$9,800
M & P of Traffic		0.0%		$0
Mobilization		7.5%		$14,600
Construction Staking		1.0%		$2,000
Minor Items (Applied to Roadway Items only)		0.0%		$0
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$220,000
INCIDENTALS		21.0%		$46,200
CONTINGENCIES		10%		$22,000
		TOTAL ESTIMATED COST		**$288,200**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

Notes

1) Cost for bridge may vary widely based on selected materials, structure width, span between supports, etc. This estimate assumes a 10' clear width pre-fabricated steel truss bridge, with synthetic lumber decking and a single clear span of 80 feet.

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **6'walk**
Depth:
Type: **6' Walk - Cantileverd off of Washingto**
From Sta:
To Sta:
A length of **250** Feet as shown on the plans

#27-2

Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Concrete for attaching to Pier / Abuttment	4	EA	$5,000.00	$20,000
steel bearings	4	EA	$500.00	$2,000
Structural Concrete decking and Parapet	250	LF	$1,800.00	$450,000
Crane	1	LS	$8,000.00	$8,000
Contract Items			**SUBTOTAL**	$480,000
Clearing and Grubbing Roadway		5.0%		$24,000
M & P of Traffic		1.5%		$7,200
Mobilization		7.5%		$36,000
Construction Staking		1.0%		$4,800
Minor Items (Applied to Roadway Items only)		20.0%		$96,000
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$650,000
INCIDENTALS		21.0%		$136,500
CONTINGENCIES		10%		$65,000
		TOTAL ESTIMATED COST		**$851,500**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **6'walk**
Depth:
Type: **6' Walk - Cantileverd off of Eagle St br**
From Sta:
To Sta:
A length of **210** Feet as shown on the plans

#28
Price Base Yr **2010**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Concrete for attaching to Pier / Abuttment	4	EA	$5,000.00	$20,000
steel bearings	4	EA	$500.00	$2,000
Structural Concrete decking and Parapet	210	LF	$1,800.00	$378,000
pedestrian warning signal	1	EA	$100,000.00	$100,000
Crane	1	LS	$8,000.00	$8,000
Contract Items			**SUBTOTAL**	$508,000
Clearing and Grubbing Roadway		5.0%		$25,400
M & P of Traffic		1.5%		$7,600
Mobilization		7.5%		$38,100
Construction Staking		1.0%		$5,100
Minor Items (Applied to Roadway Items only)		20.0%		$101,600
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$690,000
INCIDENTALS		21.0%		$144,900
CONTINGENCIES		10%		$69,000
		TOTAL ESTIMATED COST		**$903,900**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use in ROW - on ex pavement**
From Sta:
To Sta:
A length of **7,080** Feet as shown on the plans

#29
Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	7,080	LF	$14.00	$99,120
Steel-Backed Timber Guide Rail	7,080	LF	$125.00	$885,000
processed aggregate	7,080	LF	$17.00	$120,360
superpave	7,080	LF	$20.00	$141,600
utility pole relocation	32	EA	$5,000.00	$160,000
Contract Items			**SUBTOTAL**	$1,406,100
Clearing and Grubbing Roadway		5.0%		$70,300
M & P of Traffic		1.5%		$21,100
Mobilization		7.5%		$105,500
Construction Staking		1.0%		$14,100
Minor Items (Applied to Roadway Items only)		20.0%		$52,400
Contingencies & Incidentals		**CONSTRUCTION TOTAL**		$1,670,000
INCIDENTALS		21.0%		$350,700
CONTINGENCIES		10%		$167,000
		TOTAL ESTIMATED COST		**$2,187,700**

Estimated By:VC
Checked By:TJG

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth:
Type: **Unimproved Nature Trail**
From Sta:
To Sta:
A length of **1,110** Feet as shown on the plans

#30

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
clearing and grubbing	1,110	LF	$3.00	$3,330
Contract Items			**SUBTOTAL**	$3,300
M & P of Traffic		1.5%		$0
Mobilization		7.5%		$200
Construction Staking		1.0%		$0
Minor Items (Applied to Roadway Items only)		20.0%		$700
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$4,200
INCIDENTALS		21.0%		$882
CONTINGENCIES		10%		$420
			TOTAL ESTIMATED COST	**$5,502**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **1,150** Feet as shown on the plans

#31

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	1,150	LF	$14.00	$16,100
processed aggregate	1,150	LF	$17.00	$19,550
superpave	1,150	LF	$20.00	$23,000
Contract Items			**SUBTOTAL**	$58,700
Clearing and Grubbing Roadway		5.0%		$2,900
M & P of Traffic		1.5%		$900
Mobilization		7.5%		$4,400
Construction Staking		1.0%		$600
Minor Items (Applied to Roadway Items only)		20.0%		$8,500
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$80,000
INCIDENTALS		21.0%		$16,800
CONTINGENCIES		10%		$8,000
			TOTAL ESTIMATED COST	**$104,800**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth:
Type: **Unimproved Nature Trail**
From Sta:
To Sta:
A length of **1,020** Feet as shown on the plans

#32

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
clearing and grubbing	1,020	LF	$3.00	$3,060
Contract Items			**SUBTOTAL**	$3,100
M & P of Traffic		1.5%		$0
Mobilization		7.5%		$200
Construction Staking		1.0%		$0
Minor Items (Applied to Roadway Items only)		20.0%		$600
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$3,900
INCIDENTALS		21.0%		$819
CONTINGENCIES		10%		$390
			TOTAL ESTIMATED COST	**$5,109**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width: **10'**
Depth: **12"**
Type: **Shared-Use Off-Street**
From Sta:
To Sta:
A length of **4,130** Feet as shown on the plans

#33

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
earth excavation	4,130	LF	$14.00	$57,820
processed aggregate	4,130	LF	$17.00	$70,210
superpave	4,130	LF	$20.00	$82,600
utility pole relocation	3	EA	$5,000.00	$15,000
Contract Items			**SUBTOTAL**	$225,600
Clearing and Grubbing Roadway		5.0%		$11,300
M & P of Traffic		1.5%		$3,400
Mobilization		7.5%		$16,900
Construction Staking		1.0%		$2,300
Minor Items (Applied to Roadway Items only)		20.0%		$30,600
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$290,000
INCIDENTALS		21.0%		$60,900
CONTINGENCIES		10%		$29,000
			TOTAL ESTIMATED COST	**$379,900**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width:
Depth:
Type: **Ped / Bike Trailhead**
From Sta:
To Sta:
A length of

T

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Ped / Bike Trailhead	1	EA	$8,000.00	$8,000
Contract Items			**SUBTOTAL**	$8,000
Clearing and Grubbing Roadway		5.0%		$400
M & P of Traffic		1.5%		$100
Mobilization		7.5%		$600
Construction Staking		1.0%		$100
Minor Items (Applied to Roadway Items only)		20.0%		$0
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$10,000
INCIDENTALS		21.0%		$2,100
CONTINGENCIES		10%		$1,000
			TOTAL ESTIMATED COST	**$13,100**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width:
Depth:
Type: **Small Boat Launch**
From Sta:
To Sta:
A length of

B

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Small Boat Launch	1	EA	$5,000.00	$5,000
Contract Items			**SUBTOTAL**	$5,000
Clearing and Grubbing Roadway		5.0%		$300
M & P of Traffic		1.5%		$100
Mobilization		7.5%		$400
Construction Staking		1.0%		$100
Minor Items (Applied to Roadway Items only)		20.0%		$0
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$10,000
INCIDENTALS		21.0%		$2,100
CONTINGENCIES		10%		$1,000
			TOTAL ESTIMATED COST	**$13,100**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width:
Depth:
Type: **Trailhead with Parking (Large)**
From Sta:
To Sta:
A length of

P(L)

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Ped / Bike Trailhead	1	EA	$8,000.00	$8,000
Parking Lot	8,000	SF	$7.00	$56,000
Contract Items			**SUBTOTAL**	$64,000
Clearing and Grubbing Roadway		5.0%		$3,200
M & P of Traffic		1.5%		$1,000
Mobilization		7.5%		$4,800
Construction Staking		1.0%		$600
Minor Items (Applied to Roadway Items only)		20.0%		$0
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$70,000
INCIDENTALS		21.0%		$14,700
CONTINGENCIES		10%		$7,000
			TOTAL ESTIMATED COST	**$91,700**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width:
Depth:
Type: **Trailhead with Parking (Small)**
From Sta:
To Sta:
A length of

P(S)

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Ped / Bike Trailhead	1	EA	$8,000.00	$8,000
Parking Lot	4,200	SF	$7.00	$29,400
Contract Items			**SUBTOTAL**	$37,400
Clearing and Grubbing Roadway		5.0%		$1,900
M & P of Traffic		1.5%		$600
Mobilization		7.5%		$2,800
Construction Staking		1.0%		$400
Minor Items (Applied to Roadway Items only)		20.0%		$0
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$40,000
INCIDENTALS		21.0%		$8,400
CONTINGENCIES		10%		$4,000
			TOTAL ESTIMATED COST	**$52,400**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width:
Depth:
Type: **Transit Center**
From Sta:
To Sta:
A length of

TC

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Transit Center	1	EA	$75,000.00	$75,000
Contract Items			**SUBTOTAL**	$75,000
Clearing and Grubbing Roadway		5.0%		$3,800
M & P of Traffic		1.5%		$1,100
Mobilization		7.5%		$5,600
Construction Staking		1.0%		$800
Minor Items (Applied to Roadway Items only)		20.0%		$0
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$90,000
INCIDENTALS		21.0%		$18,900
CONTINGENCIES		10%		$9,000
			TOTAL ESTIMATED COST	**$117,900**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width:
Depth:
Type: **Trailhead with Parking (Large)**
From Sta:
To Sta:
A length of

Park (L)

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Ped / Bike Trailhead	1	EA	$8,000.00	$8,000
Large Park Development	1	LS	$120,000.00	$120,000
Contract Items			**SUBTOTAL**	$128,000
Clearing and Grubbing Roadway		5.0%		$6,400
M & P of Traffic		1.5%		$1,900
Mobilization		7.5%		$9,600
Construction Staking		1.0%		$1,300
Minor Items (Applied to Roadway Items only)		20.0%		$0
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$150,000
INCIDENTALS		21.0%		$31,500
CONTINGENCIES		10%		$15,000
			TOTAL ESTIMATED COST	**$196,500**

Estimated By:VC
Checked By:

Date of Estimate: 10/07/2009

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION
BUREAU OF ENGINEERING & HIGHWAY OPERATIONS
FUSS & O'NEILL
PRELIMINARY COST ESTIMATE

City of: **Waterbury**
Funding:
Project #: **20081553.A10**
Width:
Depth:
Type: **Trailhead with Parking (Large)**
From Sta:
To Sta:
A length of

Park (L)

Price Base Yr **2008**

Roadway Items	Est. Quant.	Unit	Unit Price	Total
Ped / Bike Trailhead	1	EA	$8,000.00	$8,000
Small Park Development	1	LS	$40,000.00	$40,000
Contract Items			**SUBTOTAL**	$48,000
Clearing and Grubbing Roadway		5.0%		$2,400
M & P of Traffic		1.5%		$700
Mobilization		7.5%		$3,600
Construction Staking		1.0%		$500
Minor Items (Applied to Roadway Items only)		20.0%		$0
Contingencies & Incidentals			**CONSTRUCTION TOTAL**	$60,000
INCIDENTALS		21.0%		$12,600
CONTINGENCIES		10%		$6,000
			TOTAL ESTIMATED COST	**$78,600**

Estimated By:VC
Checked By:

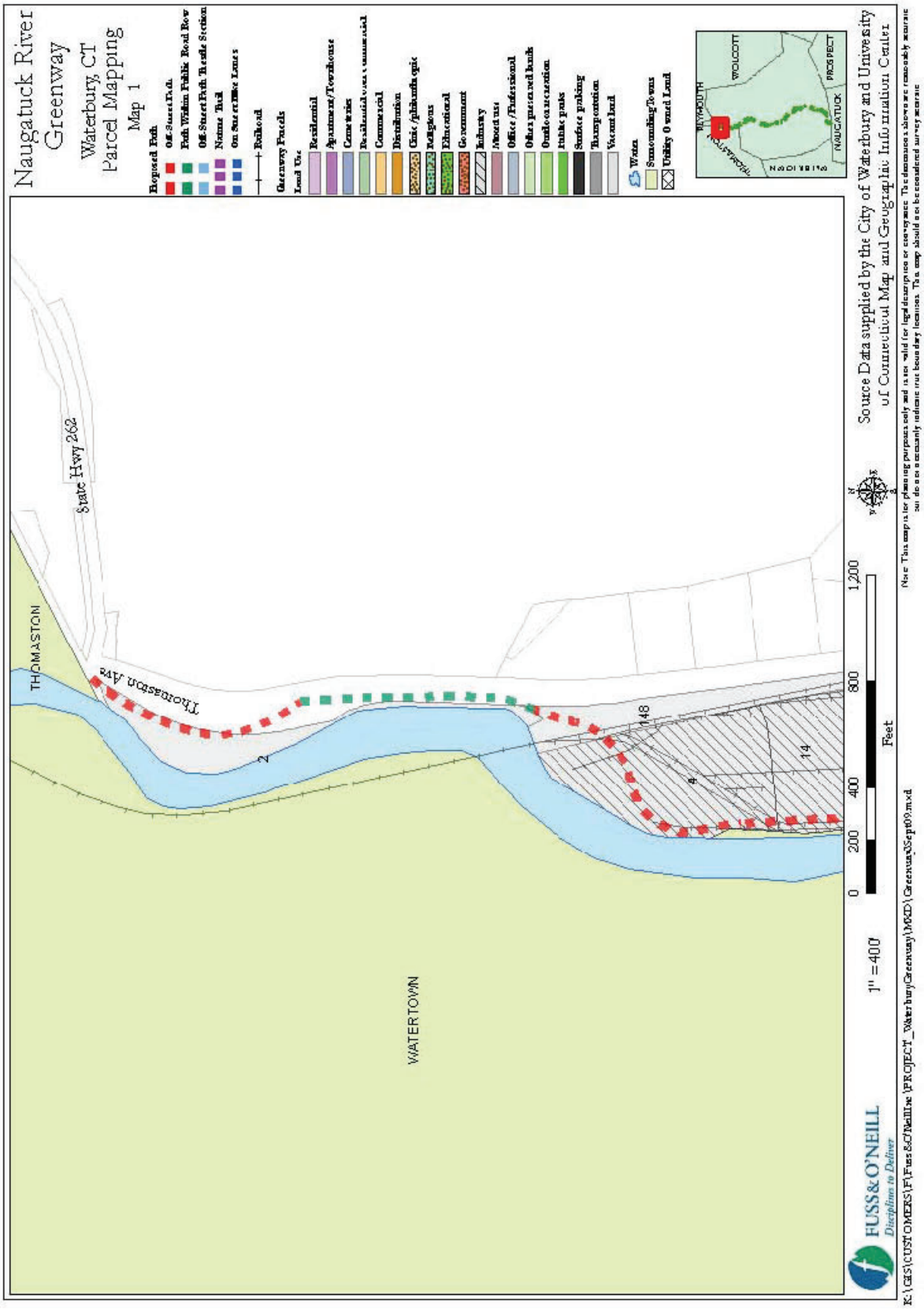
Date of Estimate: 10/07/2009

Appendix B – Parcels Along Proposed Greenway Alignment

PARCEL LABEL	MAP-BLOCK-LOT	LAND USE	APPROXIMATE ACREAGE	PROPERTY ADDRESS	PRIMARY OWNER	SECONDARY OWNER	OWNER ADDRESS	CITY	STATE	ZIP CODE	POTENTIAL AVAILABILITY	GREENWAY NOTES & COMMENTS
2	U019-0973-0001	Vacant land	5.24	THOMASTON AVE	CITY OF WATERBURY							
4	0036-0973-0011	Light industry	7.74	2223 THOMASTON AVE	MR REAL LLC		1883 THOMASTON AVE	WATERBURY	CT	06704-1034		
14	0036-0973-0001	Light industry	30.27	1375 THOMASTON AVE	WATERBURY INDUSTRIAL COMMONS		1875 THOMASTON AVE	WATERBURY	CT	06704-0000		
119	0100-0024-0271	Commercial -convenience	44.61	990 HUNTINGDON AVE	JON-MAR LLC		832 WATERVILLE ST	WATERBURY	CT	06710-0000		Owner Expressed interest at Public Meeting
148	0036-0973-0000	Vacant land / Railroad	6.07									Railroad (assume to be CDOT) further research required
177	0073-0973-0000		1.76									Research required to clarify ownership
186	0170-0024-0001	Vacant land	0.90	THOMASTON AVE	AMERICAN BRASS CO		P O BOX 1540	WATERVILLE	IL	60555-0000		
188	U196-0024-0002	Vacant land	8.83	THOMASTON AVE	VLEISIS PETER JR		370 WATERTOWN RD	MIDDLEBURY	CT	06762-0000		
190	0196-0024-0023	Distribution	4.54	THOMASTON AVE	RICKEY BROADCASTING	CORPORATION OF CONNECTIC	166 W PUTNAM AVE	GREENWICH	CT	06830-0000		
194	0213-0024-0043	Distribution	2.38	335 THOMASTON AVE	BURGER & BURGER ASSOCIATES		P O BOX 2584 365 THOMAST	WATERBURY	CT	06723-0000		
197	0214-0024-0007	Distribution	1.46	325 THOMASTON AVE	KELLY THOMAS L		325 THOMASTON AVE	WATERBURY	CT	06702-1010		
198	0214-0024-0008	Light industry	2.74	311 THOMASTON AVE	WATERBURY SCREW MACH PROD		311 THOMASTON AVE	WATERBURY	CT	06702-1010		
200	0214-0024-0112	Government	6.46									City owned? / Research required to clarify ownership
202	0000-0000-0000	Railroad	4.95									Railroad (assume to be CDOT) further research required
204	0233-0024-0002	Professional/medical office	5.93	245 THOMASTON AVE	TIGER REALTY LLC		145 SCENIC COURT	CHESHIRE	CT	06410-2315		
205	0252-0024-0411	Commercial -convenience	20.12	95 THOMASTON AVE	R&B THOMASTON LLC		2100 RJRR ST	FAIRFIELD	CT	06824-0000		
210	0252-0024-0011	Commercial -convenience	1.62	WEST MAIN ST	THOMASTON AVENUE CENTER LLC		1720 POST RD	FAIRFIELD	CT	06824-0000		
212	0252-0024-0001	Light industry	3.97	770 WEST MAIN ST	MMD GROUP IV LLC		31805 HIGHWAY 79S	TEMECULA	CA	91592-0000		
246	0272-0022-0001	Vacant land	6.58	751 WEST MAIN ST	CONN LIGHT & POWER CO		P.O. BOX 270	HARTFORD	CT	0614?-0000		
260	0273-0018-0031	Light industry	8.82	385 MEADOW ST	AMERICAN REPUBLICAN INC		389 MEADOW ST	WATERBURY	CT	06702-1998		
262	0273-0018-0062	Distribution	8.39	45 FREIGHT ST	ADP REALTY LLC		271 QUASSAPAUG RD	WOODBURY	CT	06798-0000		
266	0292-0018-0012	Distribution	7.77	175 FREIGHT ST	BRASS CITY LUMBER CO		28 DEER PARK CIRCLE	WATERBURY	CT	06708-0000		
273	0000-0000-0000		3.88									Research required to clarify ownership
286	0292-0022-0001	Other office	6.02	250 FREIGHT ST	CONN LIGHT & POWER CO		BOX 270	HARTFORD	CT	0610?-0000		
287	0292-0018-0002	Professional/medical office	5.89	245 FREIGHT ST	MACDERMID INC		245 FREIGHT ST	WATERBURY	CT	06702-1815		
290	0318-0018-0003	Professional/medical office	2.24	JACKSON ST	JRC PROPERTIES LLC		17 DINUNZIO RD	OAKVILLE	CT	06779-0000		
291	0318-0018-0001	Distribution	9.90	JACKSON ST	YANKEE GAS SERVICES COMPANY		P.O. BOX 270	HARTFORD	CT	0614?-0000		
299	0343-0018-0014	Professional/medical office	1.26	99 JACKSON ST	LAIDLAW TRANSIT INC		61 INTERSTATE LANE	WATERBURY	CT	06705-0000		
301	0343-0018-0013	Vacant land	1.00	JACKSON ST	LAIDLAW TRANSIT INC		61 INTERSTATE LANE	WATERBURY	CT	06705-0000		
325	0344-0018-0003	Commercial -convenience	0.03	536 BANK ST	SCIABICA JOSEPH N & GEMMA SANITA SCIABICA TRUSTEES		2150 YOSEMITE BLVD	MODESTO	CA	95354-0000		
330	0344-0018-0004	Vacant land	0.33	600 BANK ST	WESSON INC		165 RAILROAD HILL ST	WATERBURY	CT	06708-4306		
331	0344-0018-0041	Vacant land	0.17	634 BANK ST	WESSON INC		634 BANK ST	WATERBURY	CT	06708-3530		
346	U344-U018-U042	Vacant land	U.20	631 BANK ST	WESSON INC		634 BANK ST	WATERBURY	CT	U6/U8-3530		
379	0344-0282-0006	Light industry	0.97	125 WEST LIBERTY ST	RIVERBANK CHRISTIAN WORSHIP CENTER INC		PO BOX 7087	PROSPECT	CT	06712-0000		
461	0415-0300-0032	Light industry	13.23									Research required to clarify ownership
463	0000-0000-0000		0.16									Research required to clarify ownership
466	0318-0018-0000	Railroad	5.37									Railroad (assume to be CDOT) further research required
468	0368-0282-0000	Railroad	1.59									Railroad (assume to be CDOT) further research required
543	0414-0300-0019	Distribution	5.07	140 RAILROAD HILL ST	WESSON INC	P O BOX 2127	165 RAILROAD HILL ST	WATERBURY	CT	06722-2127		
587	U438-U300-UU01	Distribution	1.16	BREWERY ST	FRANCIS PETER		71 HAMILTON AVE	WATERTOWN	CT	U6/95-UUUU		
595	0438-0300-0002	Commercial - recreation/entertn	1.93	36 BREWERY ST	FRANCIS PETER		36 BREWERY ST	WATERBURY	CT	06708-4301		
607	0438 0300 0007	Commercial - recreation/entertn	1.16	23 EAGLE ST	A & R REALTY CORP		15 ALLERTON FARM RD	MIDDLEBURY	CT	06762-0000		
660	0437-0300-0024	Commercial - recreation/entertn	12.17									Research required to clarify ownership
666	0000-0000-0000	Light industry	0.68									Research required to clarify ownership
667	0000-0000-0000	Light industry	0.50									Research required to clarify ownership
669	0000-0000-0000	Light industry	0.62									Research required to clarify ownership
674	UUUU-UUUU-UUUU	Transportation / Railroad	U.97									Railroad (assume to be CDOT) further research required
692	0519-0333-0411	Commercial - recreation/entertn	0.60	2180 SOUTH MAIN ST	FRANCISCO ASSOCIATES		1663 SOUTH MAIN ST	WATERBURY	CT	06706-2000		
695	0519 0333 0042	Commercial - recreation/entertn	2.29	SOUTH MAIN ST	FRANCISCO & ASSOCIATES		1663 SOUTH MAIN ST	WATERBURY	CT	06706 2000		
705	0548-0333-0001	Vacant land	0.75	SOUTH MAIN ST	CANYON SIGNS & GRAPHICS INC		119 WATER ST	NEW HAVEN	CT	0651?-0000		
739	U1UU-UU24-UU27	Vacant land	1.22	981 HUNTINGDON AVE	HYCHKO MARIE J		832 WATERVILLE STREET	WATERBURY	CT	U6/10-1014		
782	0519-0333-0002	Vacant land	54.94									City of Waterbury WPCA property
000	0540-0333-0002	Industrial Vacant land	7.10	SOUTH MAIN ST	NEDERMAN MIRIAM C	NANCY T CAMP, ETAL	429 SPERRY RD	BETHANY	CT	0524		Donated to City during course of the Study
801	0213-0024-0041	Vacant land	0.00	325 THOMASTON AVE	KELLY THOMAS L		325 THOMASTON AVE	WATERBURY	CT	06702-1010		
802	0391-0322-0281	Distribution	0.55	141 WASHINGTON ST	BEARINGS, INC.		P.O. BOX 3525	McKINNEY	TX	75070-0000		
805	0369 0282 C002	Heavy Industry	22.18									Research required to clarify ownership

Legend

- Donated Parcel
- Utility-Owned Properties
- City Owned Properties (Now or Future)


Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 1
Proposed Path
Off-Street Path
Path Within Public Road Row
Off-Street Path Trestle Section
Nature Trail
On-Street Bike Lanes
Railroad
Greenway Parcels
Land Use
Residential
Apartment/Townhouse
Cemeteries
Residential/Commercial
Commercial
Distribution
Civic/Philanthropic
Religious
Educational
Government
Industry
Mixed Use
Office/Professional
Other parcel with bank
Outdoor recreation
Public parks
Surface parking
Transportation
Vacant land
Water
Surrounding Towns
Utility Owned Land
WOLCOTT
PROSPECT
NAUGATUCK
WATERTOWN
THOMASTON
State Hwy 262
Thomaston Ave
148
14
4
2
0
200
400
800
1,200
Feet
1" = 400
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
FUSS&O'NEILL
Disciplines to Deliver
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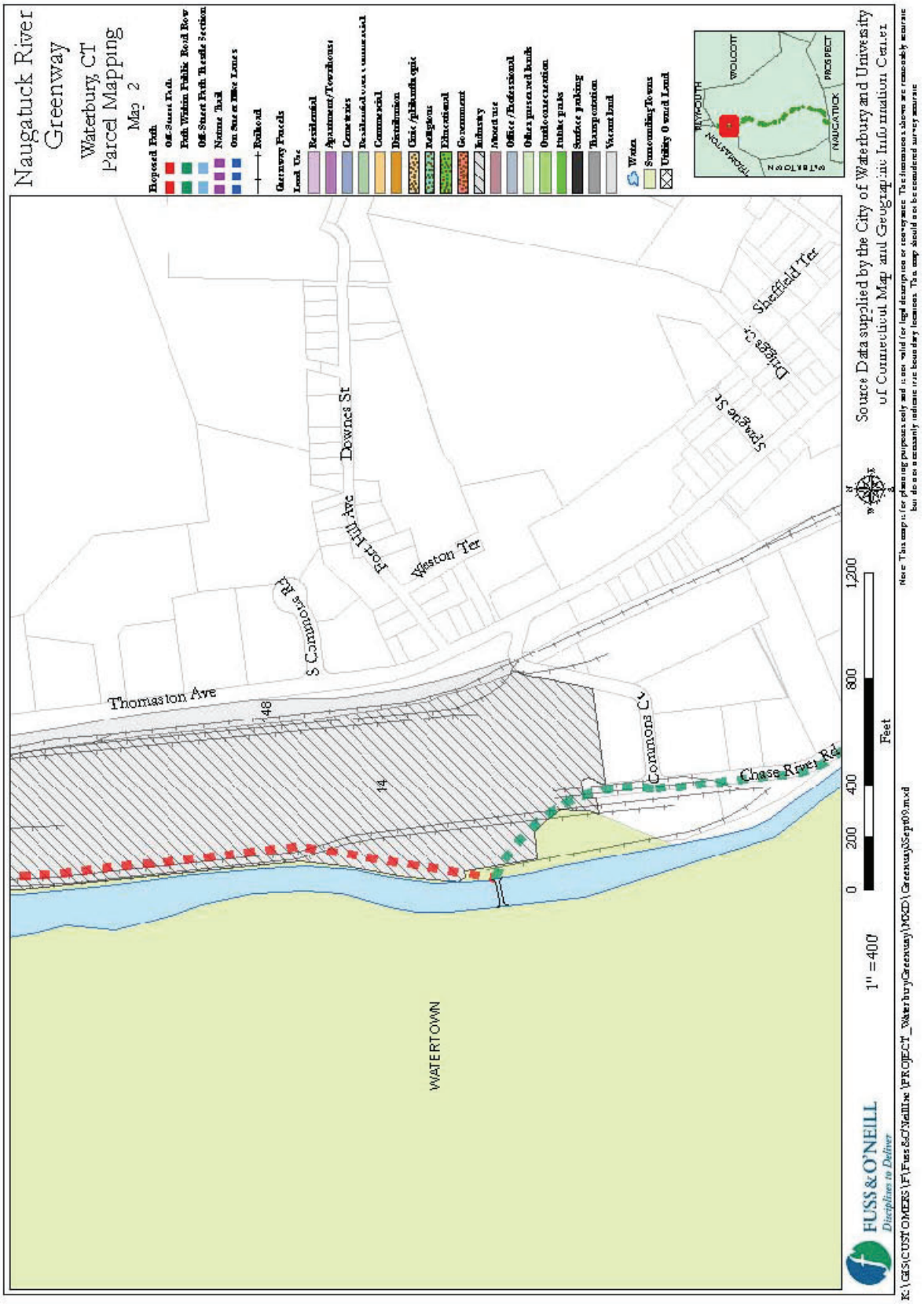
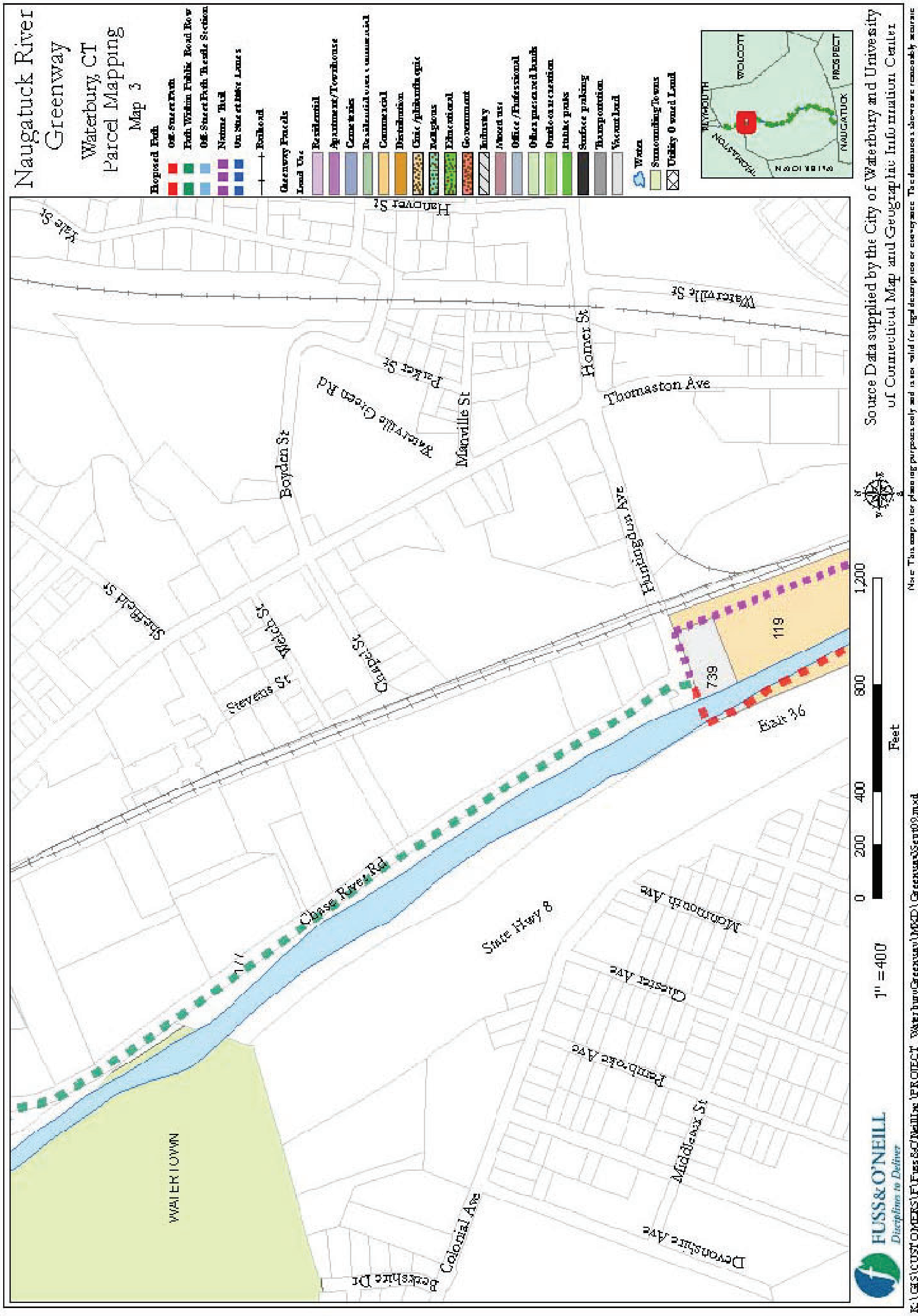
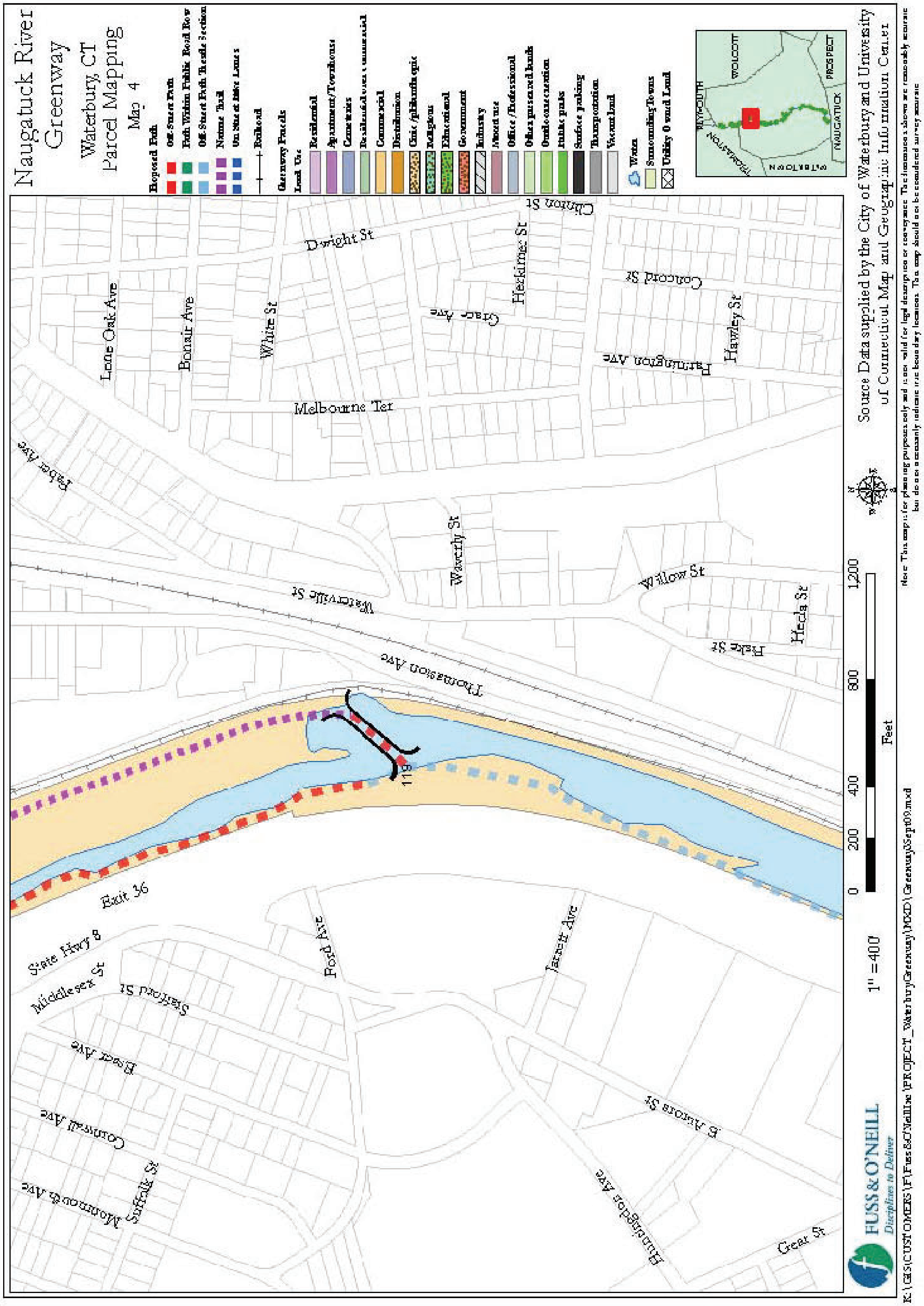
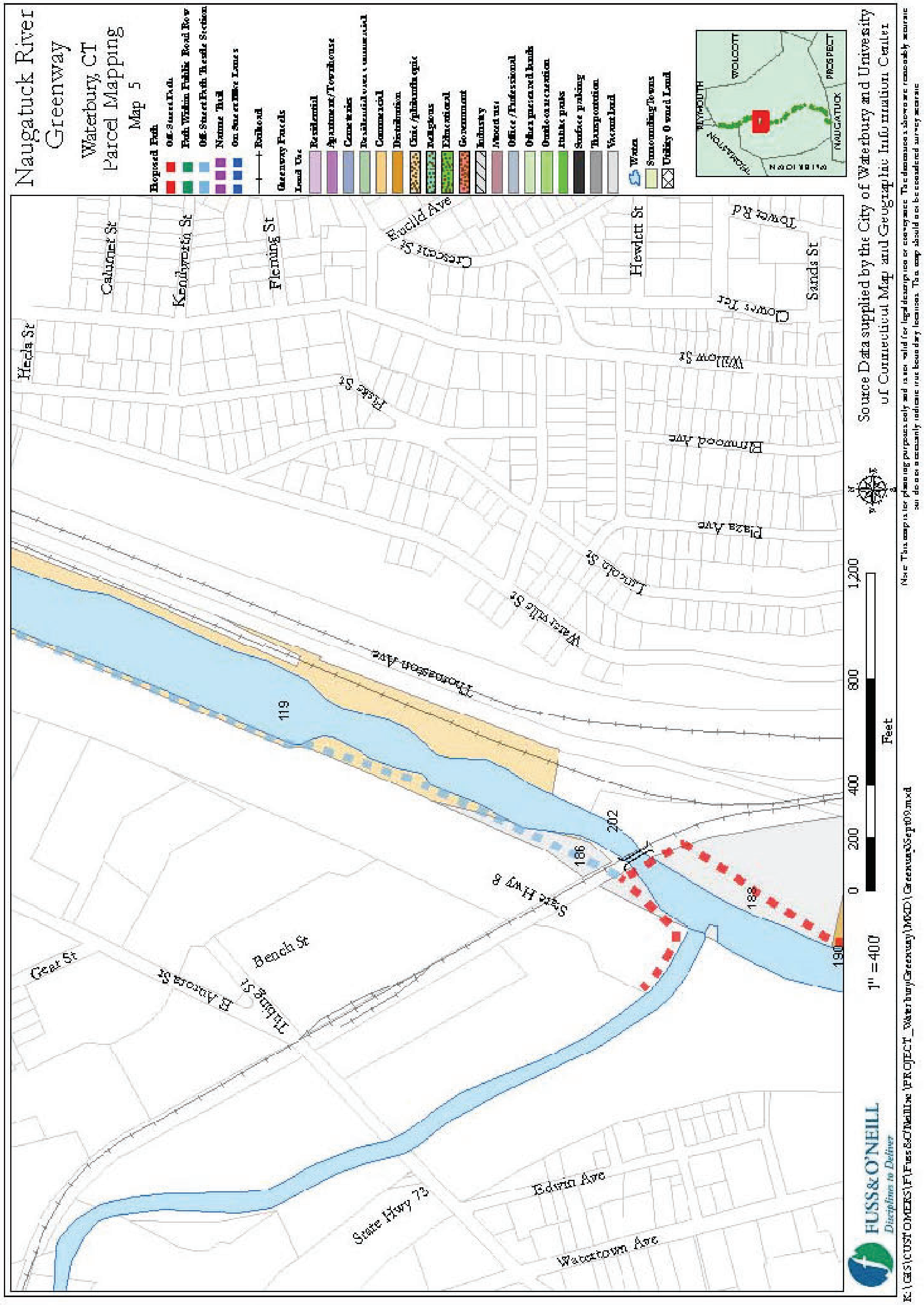
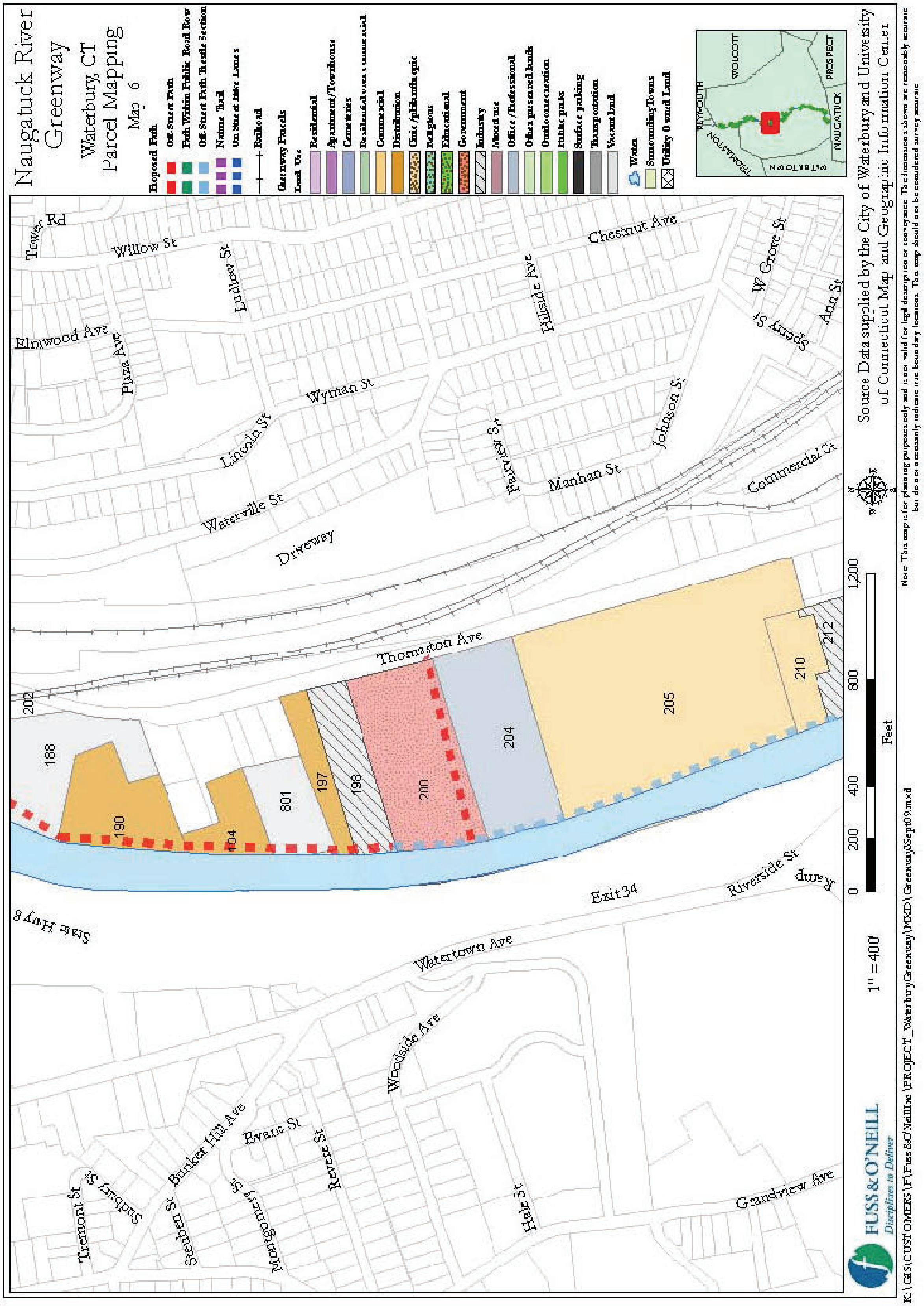
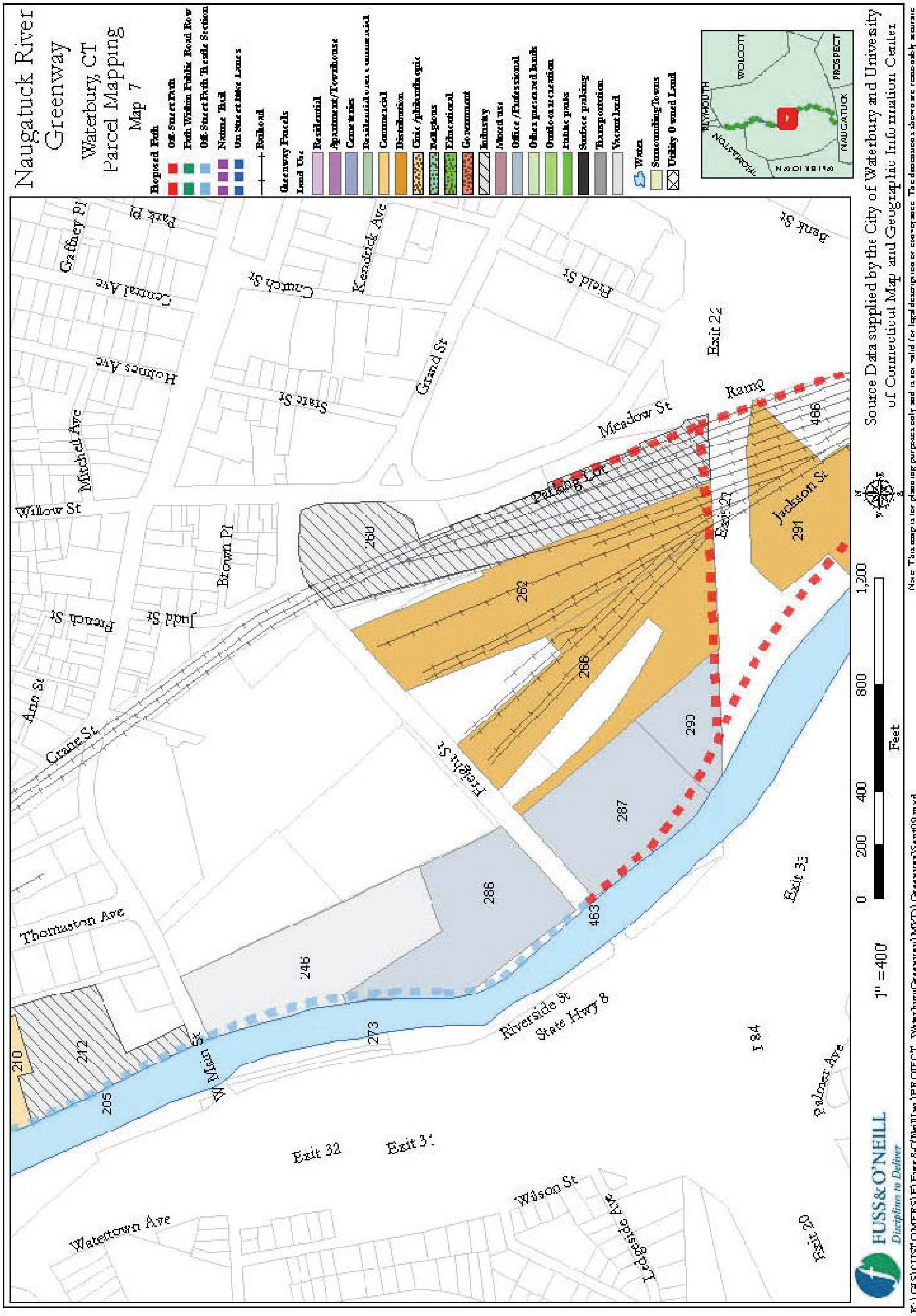

Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 2
Proposed Path
Off-Street Path
Path Within Public Road Row
Off-Street Path Transfer Section
Nature Trail
On-Street Bike Lanes
Railroad
Greenway Parcels
Land Use
Residential
Apartment/Townhouse
Cemeteries
Residential/Business Commercial
Commercial
Distribution
Civic/Philanthropic
Religious
Educational
Government
Industry
Miscellaneous
Office/Professional
Other preserved lands
Outdoor recreation
Public parks
Surface parking
Transportation
Vacant land
Water
Surrounding Towns
Utility & vacant Land
Thomaston Ave
S Commons Rd
Downs St
Hart Hill Ave
Weston Ter
Sheffield Ter
Dibble Ct
Sprague St
Commons Ct
Chase River Rd
WATERTOWN
48
14
0
200
400
800
1200
Feet
1" = 400'
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
FUSS&O'NEILL
Disciplines to Deliver

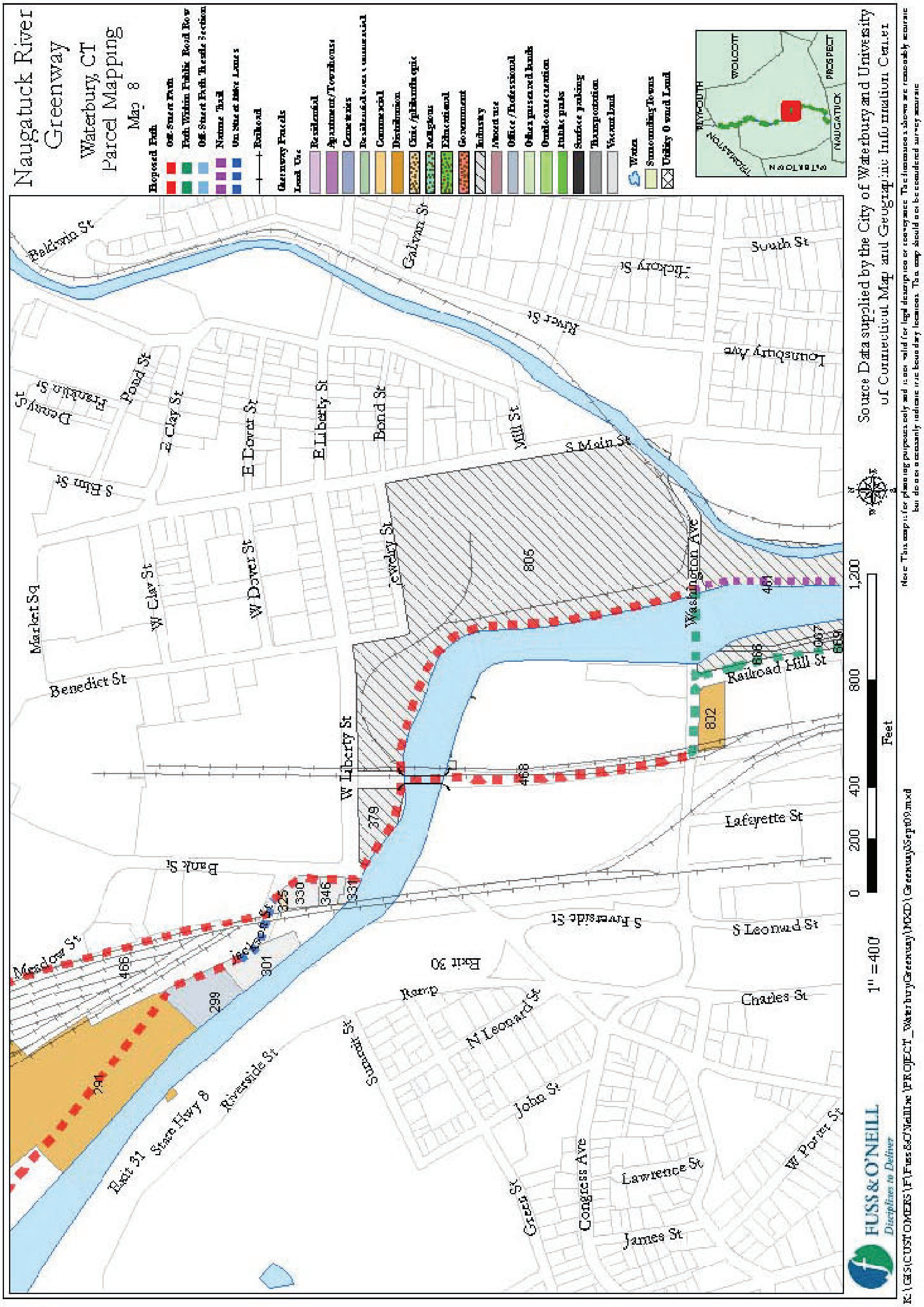

Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 3
Proposed Path
Off-Street Path
Path Within Public Road Row
Off-Street Path Trestle Section
Nature Trail
On-Street Bike Lanes
Railroad
Greenway Parcels
Land Use
Residential
Apartment/Townhouse
Cemeteries
Commercial
Distribution
Religious
Educational
Government
Industry
Office / Professional
Public parks
Surface parking
Transportation
Vacant land
Water
Surrounding Towns
Utility Owned Land
WOLCOTT
PROSPECT
NAUGATUCK
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
1" = 400'
0
200
400
800
1,200
Feet
FUSS&O'NEILL
Disciplines to Deliver
WATERTOWN
Chase River Rd
State Hwy 8
Exit 36
739
119
Huntingdon Ave
Thomaston Ave
Homer St
Waterville St
Hanover St
Yale St
Sheffield St
Stevens St
Welch St
Chapel St
Boyden St
Waterville Green Rd
Parker St
Manville St
Monmouth Ave
Chester Ave
Pembroke Ave
Middlesex St
Devonshire Ave
Colonial Ave
Berkshire Dr


Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 4
Proposed Path
Off-Street Path
Railroad
Greenway Parcels
Land Use
Residential
Commercial
Industry
Vacant land
Water
Surrounding Towns
WOLCOTT
PROSPECT
NAUGATUCK
Lone Oak Ave
Bonair Ave
White St
Dwight St
Melbourne Ter
Clinton St
Herkimer St
Grace Ave
Concord St
Farmington Ave
Hawley St
Faber Ave
Waverly St
Watertown St
Willow St
Hecla St
Thomaston Ave
Exit 36
State Hwy 8
Middlesex St
Stafford St
Ford Ave
Jarrett Ave
Essex Ave
Cornwall Ave
Suffolk St
Monmouth Ave
Huntingdon Ave
Gear St
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
1" = 400'
0
200
400
800
1,200
Feet
FUSS & O'NEILL
Disciplines to Deliver

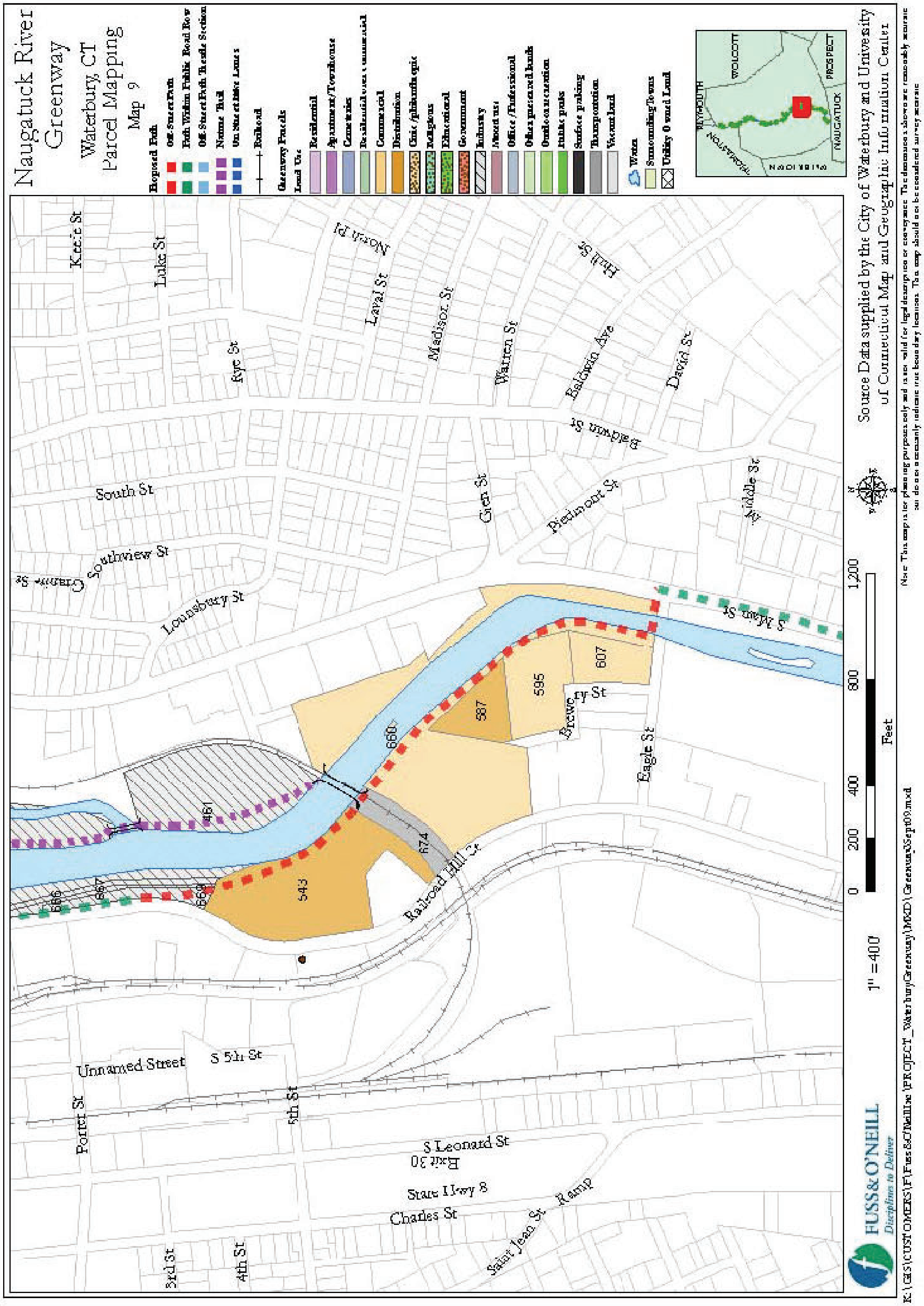

Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 5
Proposed Path
Off-Street Path
Path Within Public Road Row
Off-Street Path Trestle Section
Nature Trail
On Street Bike Lanes
Railroad
Greenway Parcels
Land Use
Residential
Apartment/Townhouse
Cemeteries
Commercial
Distribution
Religious
Educational
Government
Industry
Office/Professional
Public parks
Surface parking
Transportation
Vacant land
Water
Surrounding Towns
Utility Owned Land
WOLCOTT
PROSPECT
NAUGATUCK
Hecla St
Calumet St
Kenilworth St
Fleming St
Euclid Ave
Crescent St
Hewlett St
Tower Rd
Sands St
Clowes Ter
Willow St
Pike St
Elmwood Ave
Plaza Ave
Lincoln St
Waterville St
Thomaston Ave
State Hwy 8
Gear St
E Aurora St
Bench St
Tubing St
State Hwy 73
Edwin Ave
Watertown Ave
119
202
186
188
190
0
200
400
800
1,200
Feet
1" = 400'
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
FUSS&O'NEILL
Disciplines to Deliver

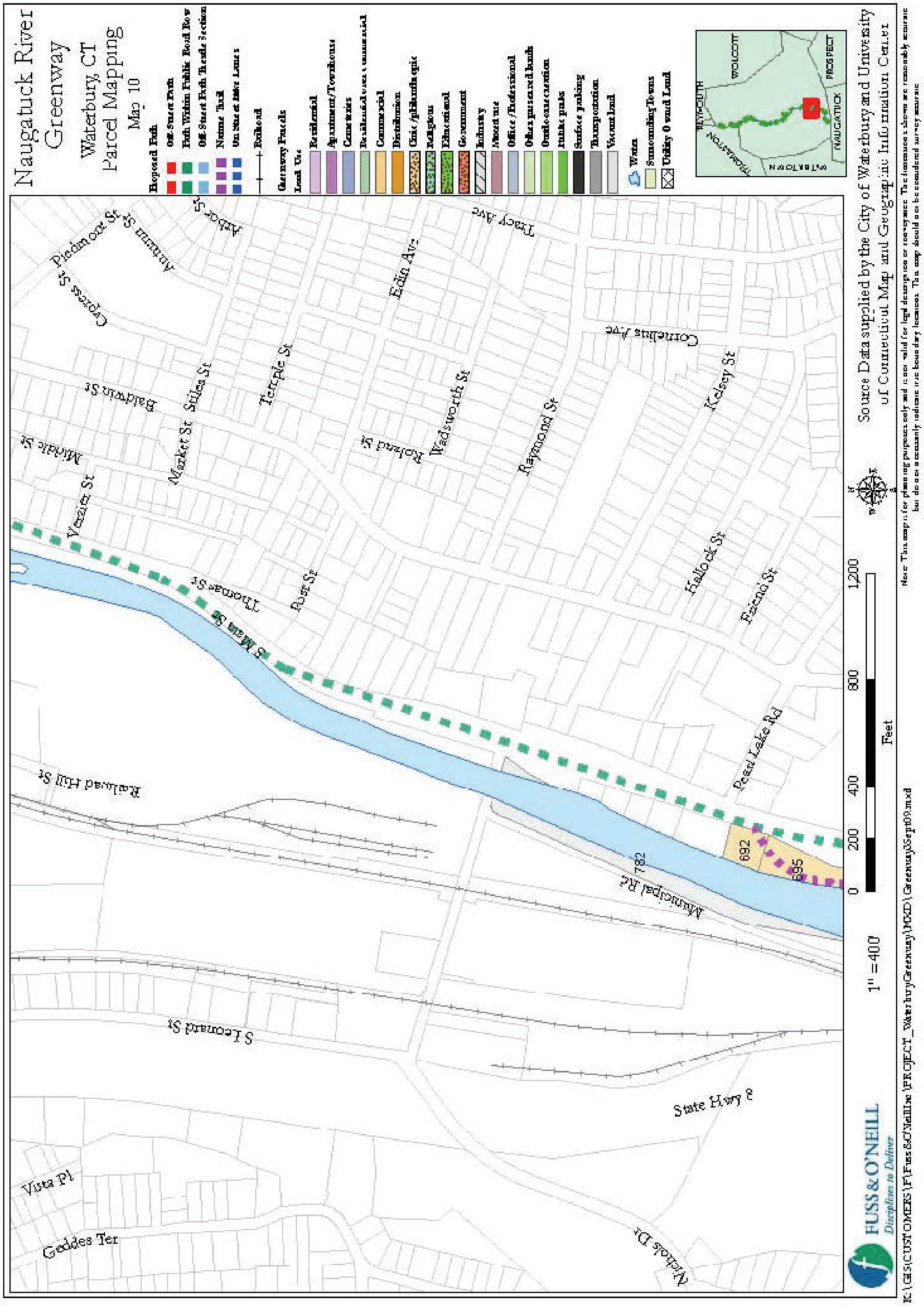

Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 6
Proposed Path
Off-Street Path
Path Within Public Road Row
Off-Street Path Trestle Section
Nature Trail
On-Street Bike Lanes
Railroad
Greenway Parcels
Land Use
Residential
Apartment/Townhouse
Cemeteries
Commercial
Distribution
Religious
Educational
Government
Industry
Office/Professional
Public parks
Surface parking
Transportation
Vacant land
Water
Surrounding Towns
Utility Owned Land
WOLCOTT
PROSPECT
NAUGATUCK
Tower Rd
Willow St
Ludlow St
Chestnut Ave
Elmwood Ave
Plaza Ave
Hillside Ave
W Grove St
Sperry St
Ann St
Wyman St
Lincoln St
Johnson St
Fairview St
Manhan St
Waterville St
Driveway
Commercial St
Thomaston Ave
State Hwy 8
Exit 34
Riverside St
Ramp
Watertown Ave
Woodside Ave
Bunker Hill Ave
Evans St
Revere St
Tremont St
Sudbury St
Steuben St
Montgomery St
Hale St
Grandview Ave
188
190
194
801
197
198
200
202
204
205
210
212
1" = 400'
0
200
400
800
1,200
Feet
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
FUSS & O'NEILL
Disciplines to Deliver

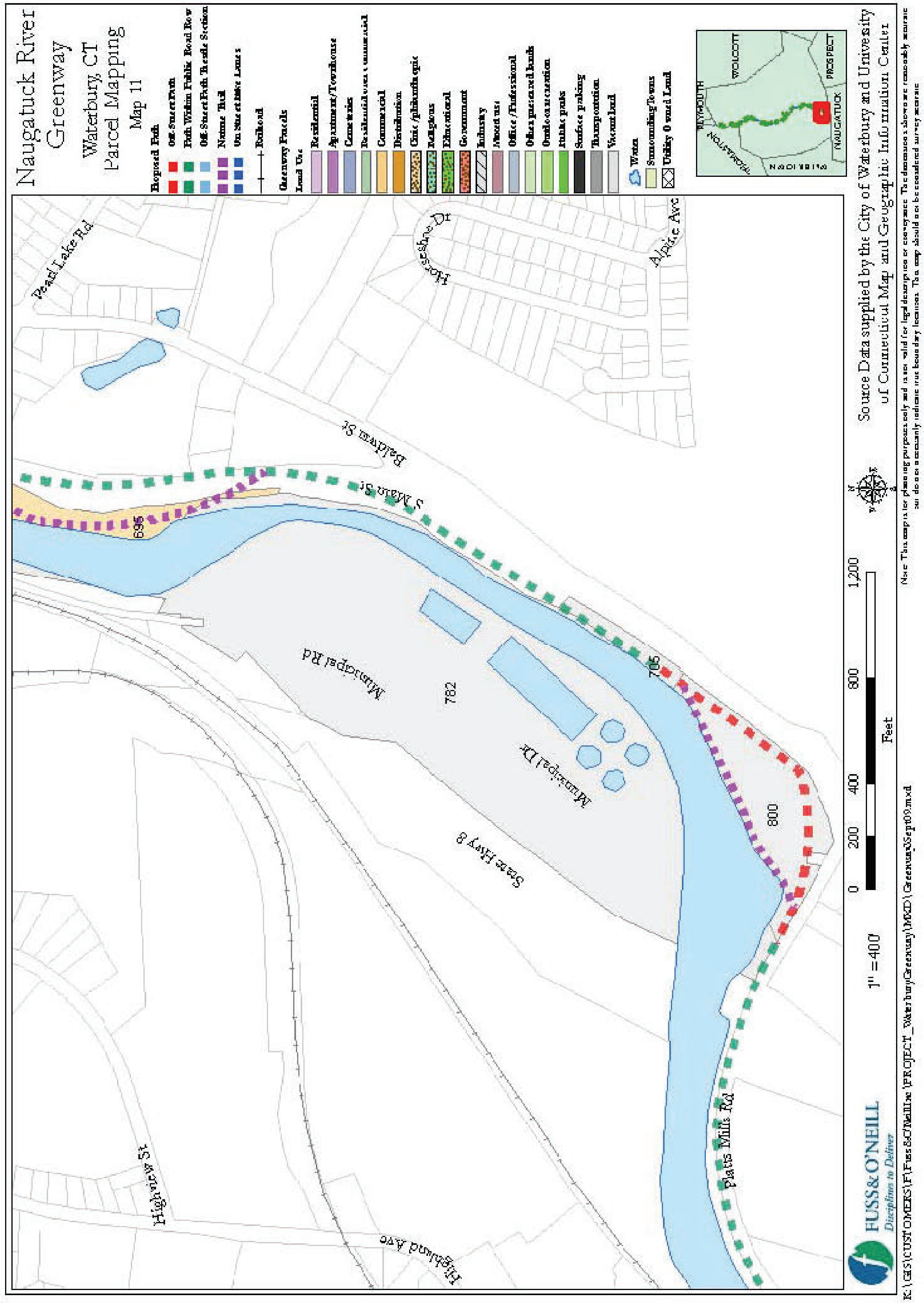

Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 7
Proposed Path
Off-Street Path
Greenway Parcels
Land Use
Residential
Apartment/Townhouse
Cemeteries
Commercial
Distribution
Religious
Educational
Government
Industry
Office / Professional
Public parks
Surface parking
Transportation
Vacant land
Water
Surrounding Towns
Utility Owned Land
WOLCOTT
PROSPECT
NAUGATUCK
MIDDLEBURY
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
1" = 400'
0 200 400 800 1,200
Feet
FUSS&O'NEILL
Disciplines to Deliver
Naugatuck River Greenway
Willow St
Mitchell Ave
Holmes Ave
Central Ave
Gaffney Pl
Park Pl
Church St
Kendrick Ave
State St
Grand St
Field St
Bank St
Exit 22
Ramp
Meadow St
Parking Lot
Jackson St
Exit 21
Brown Pl
Judd St
French St
Ann St
Crane St
Freight St
Thomaston Ave
W Main St
Riverside St
State Hwy 8
Exit 33
I 84
Palmer Ave
Exit 32
Exit 31
Wilson St
Ledgeside Ave
Watertown Ave
Exit 20
210
212
205
273
246
286
463
287
293
266
262
260
291
466

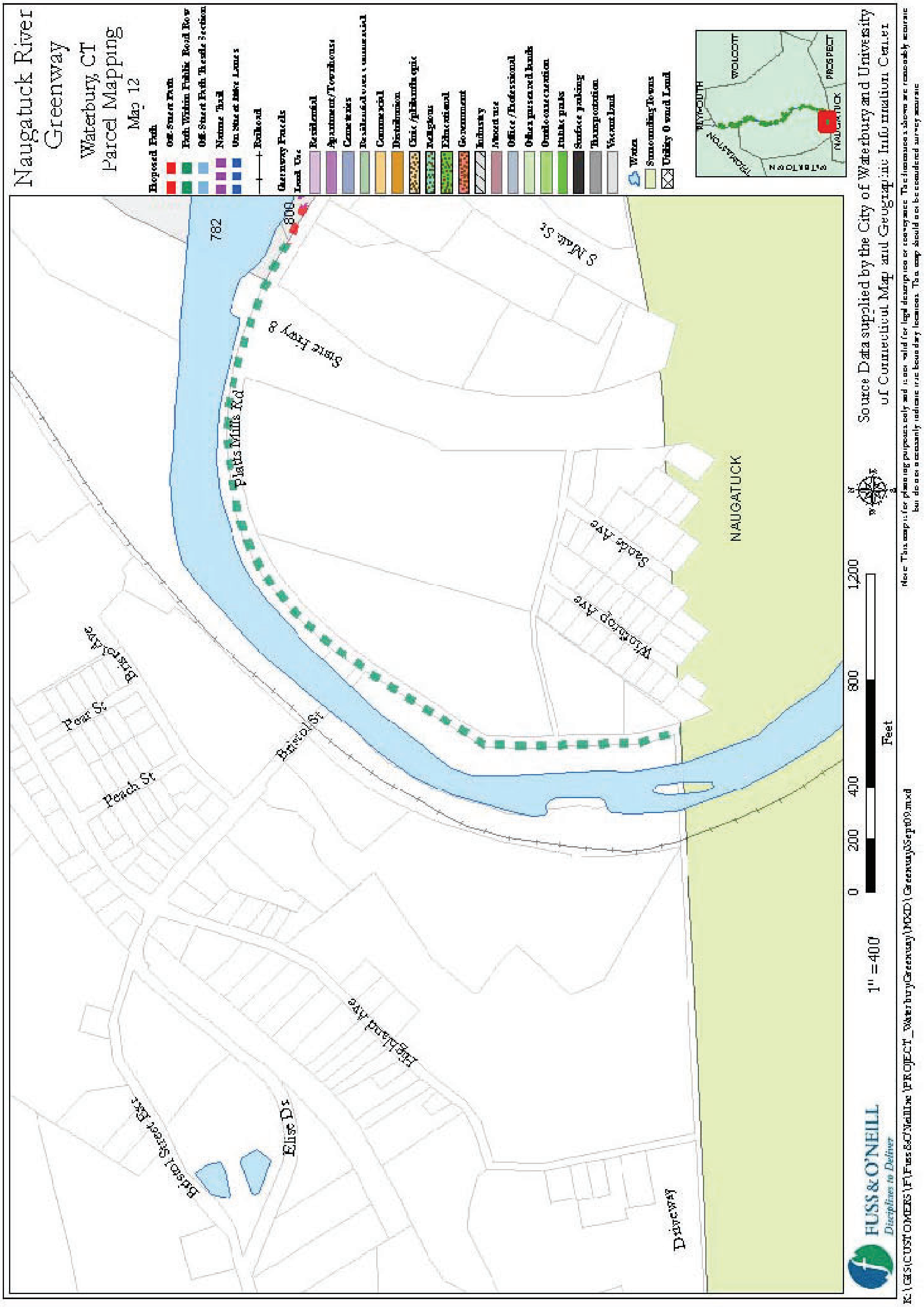


Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 8
Proposed Path
Off-Street Path
Path Within Public Road Row
Off-Street Path Trestle Section
Nature Trail
On-Street Bike Lanes
Railroad
Greenway Parcels
Land Use
Residential
Apartment/Townhouse
Cemetery
Commercial
Distribution
Religious
Educational
Government
Industry
Mixed use
Office / Professional
Outdoor recreation
Public parks
Surface parking
Transportation
Vacant land
Water
Surrounding Towns
Utility Owned Land
WOLCOTT
PROSPECT
NAUGATUCK
WATERTOWN
MIDDLEBURY
PLYMOUTH
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
Baldwin St
Galvin St
South St
Hickory St
River St
Lounsbury Ave
Pond St
Franklin St
Denny St
E Clay St
E Dover St
E Liberty St
Bond St
Mill St
S Main St
S Elm St
Market Sq
W Clay St
W Dover St
Jewelry St
Washington Ave
Benedict St
Railroad Hill St
W Liberty St
Bank St
Lafayette St
S Riverside St
S Leonard St
Meadow St
Exit 30
Ramp
Charles St
N Leonard St
Summit St
Riverside St
John St
State Hwy 8
Exit 31
Congress Ave
Lawrence St
Green St
James St
W Porter St
805
481
832
468
379
325
330
346
331
301
466
299
394
0
200
400
800
1,200
Feet
1" = 400'
FUSS & O'NEILL


Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 9
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
1" = 400'
Feet
0 200 400 800 1,200
FUSS&O'NEILL
South St
Southview St
Lounsbury St
Luke St
Laval St
Madison St
Warren St
Baldwin Ave
Baldwin St
Piedmont St
Eagle St
S Main St
Railroad Hill St
Unnamed Street
Porter St
5th St
S Leonard St
State Hwy 8
Charles St
3rd St
4th St
543
587
595
607
660
674
461


Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 10
Proposed Path
Off-Street Path
Nature Trail
Railroad
Greenway Parcels
Land Use
Residential
Apartment/Townhouse
Cemeteries
Commercial
Distribution
Religious
Educational
Government
Industry
Mixed use
Office / Professional
Public parks
Surface parking
Transportation
Vacant land
Water
Surrounding Towns
Utility Owned Land
WOLCOTT
PROSPECT
NAUGATUCK
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
Cypress St
Piedmont St
Auburn St
Arbor St
Tracy Ave
Edin Ave
Cornelius Ave
Baldwin St
Stiles St
Temple St
Wadsworth St
Kelsey St
Middle St
Market St
Roland St
Raymond St
Vernier St
Thomas St
Rust St
Kellock St
Friend St
S Main St
Pearl Lake Rd
Railroad Hill St
Municipal Rd
692
695
782
S Leonard St
State Hwy 8
Vista Pl
Geddes Ter
Nichols Dr
0
200
400
800
1,200
Feet
1" = 400'
FUSS & O'NEILL
Disciplines to Deliver


Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 11
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
1" = 400'
0 200 400 800 1,200
Feet
FUSS&O'NEILL
Disciplines to Deliver
Pearl Lake Rd
Horseshoe Dr
Alpine Ave
Baldwin St
S Main St
Municipal Rd
Municipal Dr
State Hwy 8
Platts Mills Rd
Highview St
Highland Ave
695
705
782
800


Naugatuck River Greenway
Waterbury, CT
Parcel Mapping
Map 12
Proposed Path
Off-Street Path
Path Within Public Road Row
Nature Trail
Railroad
Greenway Parcels
Land Use
Residential
Apartment/Townhouse
Cemeteries
Commercial
Distribution
Religious
Educational
Government
Industry
Mixed use
Office /Professional
Outdoor recreation
Public parks
Surface parking
Transportation
Vacant land
Water
Surrounding Towns
Utility Owned Land
WOLCOTT
PROSPECT
NAUGATUCK
782
800
S Main St
State Hwy 8
Platts Mills Rd
Sands Ave
Winthrop Ave
Bristol St
Bristol Ave
Pear St
Peach St
Highland Ave
Elise Dr
Bristol Street Ext
Driveway
NAUGATUCK
1" = 400'
0 200 400 800 1,200
Feet
Source Data supplied by the City of Waterbury and University of Connecticut Map and Geographic Information Center
FUSS & O'NEILL
Disciplines to Deliver