



Regional Naugatuck River Greenway Routing Study Borough of Naugatuck, Connecticut



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Council of Governments of the Central Naugatuck Valley



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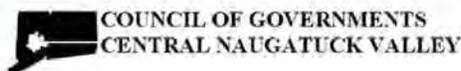
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Cover image: Future greenway spur trail improvements along Water Street

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1. Overview

The Regional Naugatuck River Greenway Routing Study report recommends routing for the Naugatuck River Greenway trail through the Borough of Naugatuck, Connecticut. The routing is the product of a year-long effort to study, analyze and develop routing recommendations for a Naugatuck River Greenway trail along the Naugatuck River in Western Connecticut. As part of this project, greenway routing reports were also created for Thomaston, Watertown and Beacon Falls. A routing report was also created for Waterbury, as part of a separate process. The overall goal of these reports is to identify a route for a 22-mile long regional greenway trail in the Central Naugatuck Valley Region. It is envisioned that this greenway will ultimately extend 44 miles from Torrington in the north to Derby in the south.

The two primary goals of the Naugatuck River Greenway (NRG) are:

- 1) To develop a non-motorized transportation facility for walkers and cyclists.
- 2) To provide public access to the Naugatuck River.

The NRG will provide Naugatuck residents with a safe pedestrian and bicycle path that will connect to neighboring municipalities. The NRG will facilitate river access for fishing and small boat launches. The recommended alignment in Naugatuck remains within viewing distance of the river for almost the entire proposed route. This allows users to appreciate the beauty of the Naugatuck River, even when being directly alongside of it is not possible or practical.

In most areas along the length of the alignment, the preferred greenway route was apparent due to the relative ease of developing a trail along one side of the river versus the opposite bank. In a handful of locations, however, routing options were presented and narrowed down after input from the general public, the Regional Naugatuck River Greenway Committee, town officials and Council of Governments of the Central Naugatuck Valley (COGCNV) staff.

For the 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 future trail’s design will be context sensitive; in some sections it may be a paved, shared-use path for pedestrians and bicyclists, while in others, the trail may be a rustic, natural-surface path more amenable to equestrians. The Study also makes recommendations for the trail and related improvements such as trailheads, parking areas, canoe/kayak landings, on-street bike improvements and other spur connections.

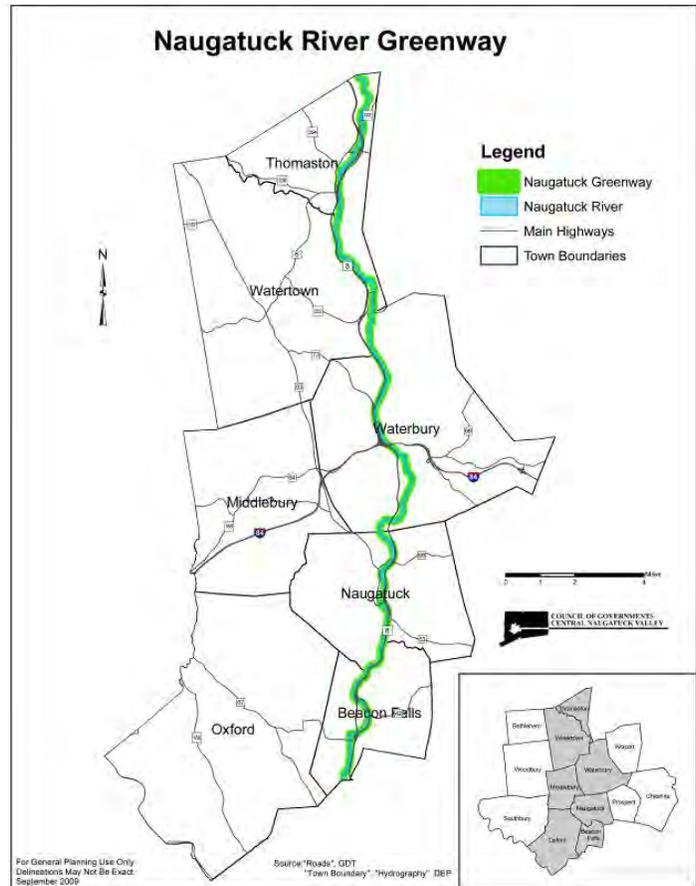


Figure 1: Map showing the five municipalities affected by this Study, though the alignment through Waterbury was determined separately.

Regional Naugatuck River Greenway Routing Study



The scenic quality of some sections of the Naugatuck River rivals that of rivers nearly anywhere in New England.

Throughout the planning process, care was taken to ensure that recommendations coming from this Study fully considered recommendations from the Waterbury Naugatuck River Greenway Routing/Feasibility Study as well as the various greenway-planning efforts occurring separately in all four municipalities. The Regional Naugatuck River Greenway Routing Study also recommends connections to nearby parks, schools, state forests and town centers along the route.

The Naugatuck River is the Central Naugatuck Valley Region's primary natural resource. While in many stretches the river has an industrial nature, in others it takes on the traits of a wild river running through far

less developed area, such as northern New England or the Berkshires.

Today, there is a new appreciation of the value of this resource in the heart of Western Connecticut. The COGCNV recognizes this portion of the Naugatuck River Greenway as the core of an interconnected greenway system that will eventually connect to Oxford, Middlebury and Southbury via Larkin State Park Trail and to Connecticut Forest and Park's Blue-Blazed hiking trail network. When complete, the Naugatuck River Greenway will:

- Serve as an alternative green transportation facility.
- Provide recreation opportunities for residents and visitors.
- Improve the quality of life in local communities.
- Increase property values adjoining the greenway.
- Help retain and attract new businesses and residents.
- Raise awareness and help build appreciation of the value of the Naugatuck River.



Greenway-oriented economic development adjacent to the Sue Grossman Still River Greenway in Torrington. (photo: Peter Kisselburgh)

2. Mission and Goals

The following Mission and Goals provide a measurable set of guidelines for the development of the Naugatuck River Greenway.

- Mission:** Develop an interconnected greenway trail along the Naugatuck River corridor from Thomaston to Beacon Falls that incorporates existing and planned trails and open spaces, and connects to nearby parks, schools, downtowns, public transportation and other destinations in order to create opportunities for non-motorized transportation and for communities to reconnect with the natural environment along the river.
- Goal 1:** Connect Thomaston, Watertown, Waterbury, Naugatuck and Beacon Falls with a contiguous multiuse greenway trail. Furthermore, access points and connectivity to commuter and tourist train stations and bus routes are necessary for the proposed trail to be a successful transportation and recreational facility.
- Goal 2:** Increase the number of people walking and bicycling for transportation and recreation and the number of children walking and bicycling to school in the Central Naugatuck Valley Region, helping to reduce traffic congestion, greenhouse-gas emissions and sedentary lifestyles.
- Goal 3:** Support each community's economic development efforts by routing the greenway to serve their downtown areas.
- Goal 4:** Incorporate context-sensitive design in the planning and development of the greenway trail. The trail will be sensitive to local conditions. Individual sections of the trail may be designed as a rustic, natural-surface trail or as a paved, shared-use path based on local conditions. Some stretches could be designed to encourage equestrians, depending on local conditions. Interpretive elements will reflect each community's unique heritage and culture, while a greenway logo will establish a consistent identity along the entire greenway trail.
- Goal 5:** Reconnect the communities of the Central Naugatuck Valley Region to the Naugatuck River. Provide access to the river for recreational, educational and public safety purposes. Encourage municipalities and residents to better protect the river corridor.

3. Study Methodology

The Naugatuck River Greenway Routing Study followed a methodology that included community workshops, site walks, stakeholder meetings, review of relevant planning documents, and field observations to identify short-term and long-term alternatives for development of the regional greenway. Planning tools such as GIS-based data analysis and review of aerial photography were employed as well. The mission and goals outlined in the previous section guided the planning process. A series of site walks and meetings with stakeholders in each of the communities occurred in the fall of 2009 and continued on an as-needed basis through the summer of 2010. Public workshops for the data-gathering stage were held on November 17 and 18, 2009 in Naugatuck and Thomaston, respectively and on March 23 and 24, 2010 in Beacon Falls and Watertown, respectively. Additionally, the project website (<http://www.cogcnv.org/greenway>) was maintained throughout the duration of the Study.



One of the break-out group tables at the community meeting held in Naugatuck on November 17, 2009.

A core element of the Routing Study was to identify gaps in the current greenway system and propose short- and long-term alternatives for closing the gaps and connecting existing or planned sections of the greenway. Gaps were evaluated for:

- Land ownership issues
- User accessibility
- Environmental concerns
- Physical barriers such as topography, major roads and rail lines, etc.
- Permitability, constructability and cost
- Adjacent planned development
- Community support or opposition
- Overall character, including view opportunities
- Adjacency to points of interest
- Potential or lack of access points

After the Gap Evaluation, an analysis of opportunities and challenges within the project corridor was conducted to refine the routing alternatives. Working with COGCNV planners and the Naugatuck River Greenway Committee, the alternatives were narrowed down to a recommended greenway alignment that had the community's support. In conjunction with the routing recommendations, a phasing plan for implementation, along with cost estimates for each phase were developed. The phasing recommendations take into account that greenway planning, design and development often occur over extended periods of time and early successes can help to maintain overall project support, funding and momentum.

The planning and conceptual design of the trail followed appropriate trail-related design guidelines. For example, the typical cross-section for the NRG is based on the AASHTO 1999 *Guide for the Development of Bicycle Facilities* which recommends a ten foot-wide shared-use path with two-foot soft shoulders (14 feet total) with a minimum dimension of eight feet to clear pinch points. This does not preclude, however, the possibility that some sections of the trail may include stretches that are narrower and made of permeable surfaces due to local conditions and other constraints.

4. Study Area

The study area is a 22-mile corridor along the Naugatuck River within the municipalities of Thomaston, Watertown, Waterbury, Naugatuck and Beacon Falls. The corridor is approximately one-half to one mile in width but can vary to allow for a full range of opportunities for consideration, including the potential for trails on both sides of the river or along roads, highways and rail corridors.

Within the 3.3-mile long river corridor in Naugatuck, the study area includes a variety of settings and contexts. At the very north end, both river banks are lined with a relatively-dense canopy trees as neither the rail line nor any busy roadways sit immediately adjacent to the river. On the west bank, the rail line is separated from the river by an abandoned rail right-of-way and a stand of mature trees until it reaches downtown. At the south end of Platts Mill Road, however, Route 8 runs very close to the river and dominates the east riverbank for approximately a mile until Linden Park.



River corridor looking north from the Whittemore Bridge with southbound Route 8 exit ramp.

From north to south, Linden Park is the first of a trio of existing and future park spaces along the river. This includes Breen Field and the proposed recreation fields at the former Uniroyal/Naugatuck Chemical plant site.

In between the riverside park spaces, there is a mix of commercial and industrial land uses fronting the river with downtown and residential neighborhoods sitting beyond. Along Maple Street there are a few large parcel slated for redevelopment, including those slated for the mixed-use Renaissance Center Development project. South of General Datacom and Breen Field, the river corridor includes the former Uniroyal site and sewage treatment plant on the west bank and Route 8 with the Grove and St. James cemeteries beyond on the east bank. At the far southern end of the Borough the corridor includes a commuter park-and-ride lot and Cotton Hollow Field along Cross Street and an old Route 8 right-of-way that provides access to the eastern half of the Naugatuck State Forest.

5. Potential Greenway Routing Analysis

The analysis of Potential Greenway Routes is based on meetings and walking tours with stakeholders, field observations and the examinations of aerial photos and GIS-based maps. This analysis is based on the long-term desire to incorporate a 8-12' wide stone dust or paved trail in close proximity to the Naugatuck River, but a narrower dirt hiking trail or on-street bike lanes in the short term are not precluded. These may be necessary to avoid difficult stretches where property ownership issues, engineering challenges or environmental constraints exist.

The Borough of Naugatuck's Greenway Routing Analysis Map (Figure 2 on page 10) includes:

- Identification of cultural and historic destinations and scenic areas that should be connected to the greenway.
- Existing, planned or proposed local greenways.
- Portions of the corridor for which no apparent routing options currently exist, i.e. gaps.
- Identification of potential spurs and loops that connect to other greenways, amenities and destinations.

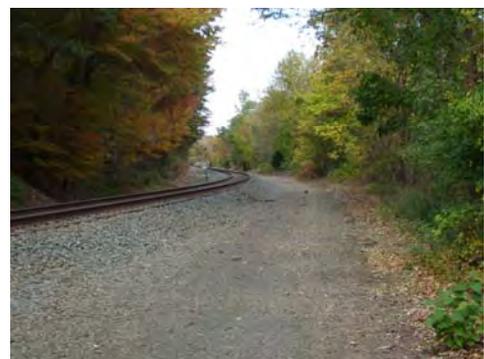
For the latter two bullet points, the map features elements along the river that present existing and potential conditions along the Naugatuck River. Potential conditions and example situations from the region are presented below:

- **No apparent routing option along the river** – typically due to the placement of Route 8 along the edge of the river or very steep hills or cliffs that may present significant challenges (note that this does not preclude the possibility of a narrow, short-term path as mentioned above).



Example: North of the Prospect Street Bridge in Naugatuck where Route 8 runs very close to the river's edge.

- **Potential 'rail with trail' along active rail line** – an active rail line with an adjacent level shelf, unutilized spur or maintenance way that is potentially wide enough to accommodate the greenway trail with an appropriate setback (ideally 20-25' but potentially as low as 10') from the rail line.



Example: The rail corridor through parts of Naugatuck may offer an opportunity for a rail-with-trail greenway section.

- **Potential trail adjacent to the river** – portions of the riverbank where spatial and topographical constraints do not prevent the routing of the trail close to the river's edge.



Example: Portions of the greenway trail within Toby's Pond and Recreational Park are likely to run adjacent to the river.

- **Potential connection along existing access road or street rights of way (ROW)** – areas where the greenway may be able to use an adjacent access road or the portion of an adjacent road ROW with sufficient width to accommodate a trail.



Example: A dirt maintenance roadway that runs between the rail line and Route 8 in Watertown is an opportunity for the trail.

- **Potential spur trail/street improvements** – these are on-road improvements that may involve creating bicycle lanes and improved pedestrian facilities such as sidewalks. These on-road improvements can help to connect the greenway to other trails, schools, cultural destinations and downtown areas.



Example: Streetscape enhancements along Elm Street in Thomaston will improve connections between the future Naugatuck River Greenway and the Clock Walk.

Regional Naugatuck River Greenway Routing Study

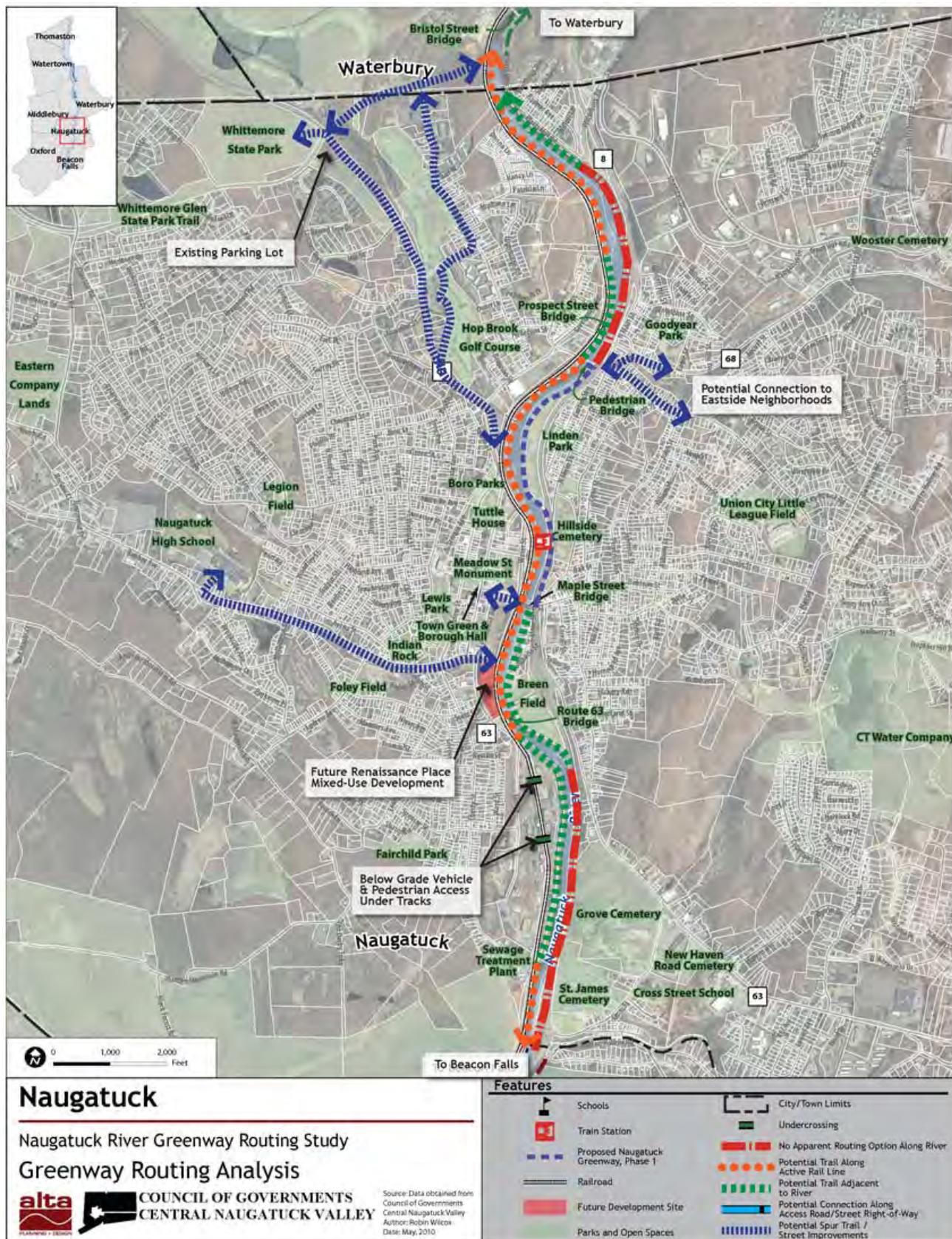


Figure 2: Greenway Routing Analysis in Naugatuck.

6. Obstacles to Access and Connectivity (Gap Analysis)

Throughout the 3.3-mile corridor in Naugatuck, there are a handful of obstacles to access and connectivity for a seamless Naugatuck River Greenway trail. The primary obstacles are the line along the west bank of the river and the Route 8 expressway on the east bank.

Starting from the Waterbury line, few constraints to NRG access exist along Platts Mill Road until it meets Route 8. Portions of Route 8 pass very close to the river's east bank, providing only space for a narrow hiking trail from Platt's Mill Road until the north end of Linden Park. On the west side, the active rail line runs along the river from the Waterbury/Naugatuck boundary to Maple Street, where it passes overhead on a trestle. Long stretches of the rail line include a wide shoulder or a separated dirt access road for service vehicles. This offers some potential for trail connectivity in the future such as connecting north to Waterbury via the Bristol Street Bridge.

Immediately south of downtown Naugatuck, private property along the river or the rail line creates obstacles to river access on both banks. However, the South Main Street right of way is a simple way to avoid the private properties on the east side and to access Breen Field. Access through the park works well for cars, walkers and bikes. At the southern end of Breen Field, Route 8 rejoins the river and runs immediately adjacent to it, in some places cantilevering out over it. Route 8 remains an obstacle to riverside access on the east bank for the remaining stretch of the river in Naugatuck. On the west bank, the obstacles created by the rail line continue to the Naugatuck State Forest, but access for vehicles, bikes and pedestrians is limited—but physically possible—on a pair of underpasses below the rail line on the former Uniroyal/Naugatuck Chemical site.

7. Affected Property Data

The parcels falling within or adjacent to the study area boundary have been identified and shown on the figures provided in Appendix B. A table with parcel size and property-owner information is also provided in Table 2 in Appendix B. The parcel inventory is intended to facilitate future correspondence between the municipality and affected property owners. The parcel table was developed from COGCNV GIS parcel database. In some instances the information may be incomplete.

In Naugatuck, a total of 13 parcels have been identified within the study corridor, not including public rights of way. Key parcels of public land within the corridor include:

- Rail corridor between Bristol Street (Waterbury) and the General Pulaski foot bridge
- Linden Park
- Breen Field
- Portions of the former Uniroyal site (in negotiation)
- Naugatuck State Forest

8. General Construction Feasibility and Cost

Experience on other greenway projects can be used to infer a planning level estimate of expected construction cost for the Naugatuck River Greenway in Naugatuck. For a typical greenway with conventional structure types in a rural setting, expected greenway construction costs for either a 10-12' paved or stone dust path range from \$0.75 to \$1.25 million per mile. Many factors will affect final cost including construction materials, commodity prices, property impacts of the selected alignment and other undetermined issues.

Costs for a greenway trail along the Naugatuck River corridor, as with most greenway projects, will be largely driven by the requirements of structural components (e.g., bridges, pile-supported walkways, etc.). The NRG through the Borough of Naugatuck is expected to capitalize on several linear assets including the scheduled and funded Naugatuck Riverwalk project, existing rail bed, Linden Park, Breen Field and the former Uniroyal site. These relatively low-cost segments will offset the three, more-expensive river crossings that will be required for a continuous trail from one end of the Borough to the other.

9. Brownfields and Environmental Constraints

Land use within Naugatuck's greenway corridor is a varied mix of commercial and industrial uses, transportation corridors and public open spaces. One significant property is the site of the former Uniroyal Chemical plant which potentially contains polluted soils in need of remediation.

In urbanized environments with a history of industry like Naugatuck, it is common to find sites contaminated with oils or hazardous materials. Older development frequently included use of urban fill materials (e.g., brick, block and asphalt within a soil and ash matrix). 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 (compounds commonly found in petroleum and combustion by-products) within urban fill materials. These concerns will likely complicate the acquisition of parcels for greenway development. As definitive designs for the various greenway segments are developed, the designer should identify parcels with known or potential historic releases of contaminants. This will allow trail designs to incorporate appropriate mitigation measures. A first order assessment of potential contamination can be made by reviewing the Connecticut Department of Environmental Protection's (CTDEP) "List of Contaminated or Potentially Contaminated Sites in Connecticut" and "List of Significant Environmental Hazards Reported to the DEP." As of September 2009 and February 2010, respectively, no sites along the greenway corridor in Naugatuck were listed by the CTDEP as contaminated. However, these lists are not exhaustive and only provide information about sites that the CTDEP is aware of. If warranted, a more detailed evaluation in the form of a Phase I/II Environmental Site Assessment may need to be undertaken.

Constructing portions of the greenway may require disturbing polluted soil, especially at the former Uniroyal site. In all cases, 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.
- *Potential for exposure:* Although the greenway may 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.).

In less developed areas, environmental constraints relate less to mitigating man-made contamination and more to protecting and managing natural resources. Sensitive resources include: wetlands, flood plains, endangered or threatened species habitat, steep slopes or erosive soils and archeological resources. In these resource areas, a special effort should be made to maintain and/or re-establish riparian buffers adjacent to the river or wetlands. These buffers help protect water quality, lower water temperatures and

provide wildlife corridors. Where the greenway is proposed to cross an area identified as a potential endangered or threatened species habitat, a review by the CTDEP should be sought early in the design process. The CTDEP will advise the municipality on appropriate measures to protect the critical habitat. If the CTDEP determines that the proposed project is likely to impact a listed threatened or endangered species, or significant natural communities, department staff will provide recommendations to avoid or minimize impacts to these species and habitats. The CTDEP permit analysts reviewing the project environmental permit applications will consider these recommendations during their review and typically incorporate appropriate conditions as part of the permit.

Where appropriate, municipalities are encouraged to work with their design professionals to incorporate low-impact design (LID) principles into the greenway. LID allows for more natural stormwater drainage patterns and promotes groundwater recharge. It helps to decrease the adverse effects of development upon our water resources. Common LID measures include permeable pavements, rain gardens, bio-filtration swales, etc. These measures may not be appropriate, however, in areas where underlying soils are polluted.

In Naugatuck, the trail is anticipated to require some work within a designated flood plain adjacent to the rail line in the north end of the alignment. In addition, the three potential new river bridges will impact the regulated floodway and require special permitting especially if any of the abutments touch the river or the adjacent floodway.

10. Safety and Security

Trail safety is a major concern of both trail users and those whose property is adjacent to a greenway trail. Emergency vehicles access to the NRG is paramount and the alignment and access point locations were planned with this in mind. The Borough of Naugatuck should plan for regular security patrols for the section of the trail within its jurisdiction and develop an emergency response plan for police, fire and ambulance service. Creating a safe trail environment goes beyond design and law enforcement, however and should involve the entire community. The most effective and most visible deterrent to illegal activity on the NRG will be the presence of legitimate trail users. Getting as many “eyes on the trail” as possible is the most effective deterrent to undesirable activity. There are several components to accomplish this:

Provide good access to the trail

Access ranges from providing conveniently-located trailheads along the Greenway, to encouraging the development of sidewalks and bike facilities along public roadways that connect to, or intersect, the NRG. Access points should be inviting and signed to welcome the public onto the trail.

Good visibility from adjacent neighbors

Neighbors adjacent to the trail can potentially provide 24-hour surveillance of the trail and can become an ally to the municipalities’ police departments. Though some screening and setback of the trail may be needed for privacy of adjacent neighbors, complete blocking out of the trail from neighborhood view should be discouraged. This eliminates the potential of neighbors’ “eyes on the trail,” and could result in a tunnel effect along the trail.

High level of maintenance

A well maintained trail sends a message that the community cares about the public space. This message alone will discourage undesirable activity along the trail.

Programmed events

Community events along any of the various segments of the NRG will help increase public awareness and thereby attract more people to use the trail. Various civic organizations can help organize public events along the trail which will increase support. Events might include a day-long trail cleanup or a series of short interpretive walks led by knowledgeable residents or a naturalist. These events could be coordinated with the Connecticut Forest and Park Trail Manager for the Blue-Blazed hiking trails that lie within the east block of the Naugatuck State Forest.

Community projects

The support generated for the NRG could be further capitalized by involving neighbors and friends of the trail in a community project. Ideas for community projects include volunteer planting events, art projects and interpretive research projects. These community projects create a sense of ownership along the greenway and serve as a strongest deterrent to undesirable activity along the trail.

Adopt-a-Trail Program

Nearby businesses, community institutions and residential neighbors often see the benefit of their involvement in trail development and maintenance. Businesses and developers may view the trail as an integral piece of their site planning and may be willing to take on some level of responsibility for the trail as well. Creation of an adopt-a-trail program should be explored to capitalize on this opportunity and build civic pride in the greenway.

11. Permitting Issues

The construction of the regional greenway along the Naugatuck River 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 individual section of the greenway trail.

Municipal 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 Municipality and most include a Connecticut Department of Environmental Protection 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 Statutes. 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 prior to or concurrent with the Planning and Zoning Permit, if required.

Municipal Planning and Zoning or Municipal Zoning Department Permit (Site Plan Approval)

- 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 basic greenway trail projects. This should be discussed with each municipality's Planning and Zoning staff once the corridor and proposed construction methods are sufficiently defined.
- Process:** Application is made to the Municipality. 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 Statutes 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. The permit application cannot be submitted prior to the application for Inland Wetlands, although they can be submitted on the same day.

FEMA Floodplain Development and Conditional Letter of Map Revision

- Basis:** Federal law with some review authority delegated to the municipality.
- Threshold:** Any earthwork or construction within a designated flood plain; work over, or in a designated floodway.
- Process:** A floodplain permit is required before construction begins within any Special Flood Hazard Area (SFHA), or any flood-prone areas if no SFHA has been defined. Permits are required to ensure that the proposed development project meets the requirements of the National Flood Insurance Program and the community's floodplain management ordinance. In Connecticut, this review is usually performed by the Planning and Zoning or Wetlands Commissions. Generally, passive recreation, such as bicycle and pedestrian trails, are allowed as permitted use in flood-prone areas. However, if the proposed construction affects the elevation or horizontal spread of flood waters, the applicant may need to apply for a Conditional Letter of Map Change (CLOMR). Application is made to FEMA with the concurrence of the municipality. The application must demonstrate that the water surface elevation will not increase by more than one foot (cumulatively with other developments) in the flood plain or by any amount in the regulatory floodway through use of hydraulic modeling software. It should be noted that some municipalities have floodplain-management regulation more restrictive than these requirements. Following construction, an application must be made for a Letter of Map Revision (LOMR) depicting actual "as-built" conditions and modeling demonstrating that the data presented in the application is valid.
- Time Line:** Normally takes twelve to eighteen months for CLOMR.

Connecticut Flood Management Certification (FMC)

- Basis:** Connecticut General Statutes and CTDEP Regulations.
- Threshold:** All State of Connecticut actions in or affecting floodplains or natural or man-made storm drainage facilities, including projects undertaken by municipalities with funding provided by the State.
- Process:** Application is made to the Connecticut Department of Environmental Protection (CTDEP). Upon receipt of a request for CTDEP approval of a state agency's flood management certification, the application is assigned to a project manager and is reviewed for sufficiency. If the application is sufficient, a detailed technical review is initiated. These reviews consist of an evaluation of the technical documentation provided in the application as well as an independent assessment of the site and of the project's consistency with the flood management standards and criteria.
- Time Line:** Normally processed within three months. If other CTDEP approvals are required, the FMC will be processed concurrently with the other applications.

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 the 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 twelve months depending upon the nature of the proposed construction.

Connecticut Department of Environmental Protection 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 ten acres of total disturbance must obtain an approval of registration, including a detailed review of the required Stormwater Pollution Control Plan.
- Process:** Application is made to CTDEP.
- Time Line:** Must be submitted at least sixty days prior to the start of construction.

Army Corps of Engineers (ACOE) Permit

Basis:	Section 404 of the Clean Water Act
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 1 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 the 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 CTDEP issues a 401 Water Quality Permit.

Connecticut Section 401 Water Quality Certification

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 the ACOE is jointly reviewed by the Connecticut Department of Environmental Protection (CTDEP). The CTDEP often requires additional information to be submitted which is not required by the ACOE.
Time Line:	Normally takes four to six months. This certification must be granted before the ACOE can issue a Category II or III permit.

12. Coordination with Other Studies

Along with the Regional Naugatuck River Greenway Routing Study, other relevant studies have recently been completed or are occurring concurrently. In some cases, some of these studies have had an impact on the routing decisions for the NRG and recommendations from this Study have led to proposal alterations to the other studies. The other studies include:

- The **Route 8 Study** is an active planning effort that is looking at ways to improve traffic flow and motorist safety at exits 22-30 along Route 8 in Seymour, Beacon Falls and Naugatuck. All design recommendations are being classified as near-, medium- or long-term improvements. From north

to south, potential projects that are most relevant for the Naugatuck River Greenway in Naugatuck include:

- Elimination of the Route 8 south-bound on-ramp from Platts Mill Road and the adjacent south-bound off ramp to create a frontage road-like connection from South Main Street in Waterbury and North Main Street in Naugatuck. This section, depending on traffic speeds and lane width, the new frontage road could be used by bicyclists for local connections.
- Widening the west side of Route 8 just north of the Prospect Street Bridge which will bring the edge of the highway closer to the Naugatuck River, creating a tighter pinch point than the one that exists today.
- Widening the North Main/Union City/City Hill intersection in Naugatuck to improve traffic flow but could make any potential pedestrian or bike connection to the neighborhoods to the east more difficult.
- Adding a shared-use path adjacent to Route 8 along the east bank of the river, just south of Linden Park in Naugatuck (overlaps with the Borough's existing greenway plans).
- Removal of the Route 8 south-bound access ramp from South Main Street, via Route 63, potentially opening up the opportunity for the greenway trail to use this de-commissioned stretch of road bed adjacent to Breen Field.
- Adding a roundabout at exit 25 in Naugatuck to better accommodate on and off-ramp traffic intermingling with Cross Street traffic (will need to be coordinated with the NRG alignment that will cross the southern leg of the roundabout).
- The **Waterbury and New Canaan Branch Lines Feasibility Study** was a CTDOT managed study to investigate and recommend improvements for two branch lines of Metro-North commuter rail network. The study's recommendations may impact the routing of the greenway in two ways:
 - A new Naugatuck Train Station is proposed on top of the Maple Street railroad overpass. This new station would have direct access to the greenway trail via the recommended pedestrian and bicycle improvements for the Whittemore Bridge.
 - Full signalization of the branch line to Waterbury is recommended. Signalization may require installation of cables, control boxers, and signal lights along the rail corridor, which could create obstacles for the rails with trails sections of the greenway trail.
- The **Waterbury Naugatuck River Greenway Routing and Feasibility Study** recommends a hybrid greenway alignment through the city that utilizes public and private property along the east and west banks of the river, numerous bridges, and a handful of roadway corridors to link difficult-to-bridge gaps along the river. The Study includes numerous loops and spur connections to important nearby destinations, as well as nature trails that run adjacent to the wider, paved greenway trail. At the south end, the Waterbury Greenway runs along the Platts Mill Road right of way and terminates at the existing small boat launch at the Naugatuck/Waterbury line.
- The **Connecticut Bicycle and Pedestrian Transportation Plan** was updated by the Connecticut Department of Transportation in 2009. The effort includes a state-wide plan and detailed map that illustrates the state's policies, existing facilities and future needs for safe and efficient travel by bike or by foot. The official bike map includes a cross-state route following Route 63 through Naugatuck.

13. Community Input

The Council of Governments of the Central Naugatuck Valley (COGCNV) hosted two pairs of public workshops for the Naugatuck River Greenway Routing Study. A workshop was held in each of the four greenway study municipalities.

The first public workshops were held on November 17 and 18, 2009 in Naugatuck and Thomaston, respectively. The purpose of the first set of workshops was to gather input from all four communities to assist in determining opportunities and challenges along the corridor and potential routing options for the greenway trail. The meeting on the 17th was focused on the issues and routing in both Naugatuck and Beacon Falls, while the next night, discussion focused on the issues and routing in Watertown and Thomaston



Elected officials from Naugatuck and Beacon Falls pose next to NRG analysis maps displayed at the November public meetings.

The second of the two pairs of public workshops were held on March 23 and 24, 2010 in Beacon Falls and Watertown, respectively. The purpose of these meetings was to gather input from the four communities on the proposed preliminary routing as well as areas where they would like to see additional amenities along the Naugatuck River Greenway.

Overall, the four community meetings, combined with other stakeholder meetings and site walks, provided COGCNV and the consultant team with valuable input on routing recommendations, design options and property-ownership issues. The team also learned of the important local connections to adjacent neighborhoods and commercial areas outside of the corridor. Additional trail spurs and other connections were added to the recommendations as a result. One attendee even suggested the clever idea of using the 22-mile greenway, plus some spurs, as the route for the Naugatuck River Marathon in the future.

Draft routing maps were also posted on the project website. Comments on the greenway routing maps were received at the workshops, via e-mail and by U.S. Mail.

Press releases were published for both sets of workshops in the Republican American and other town papers. Articles were written and published on the workshops, including references to the project website. Video of the Thomaston workshop was posted to the Republican American website.

Subsequent to the community meetings, members of the Connecticut Horse Council and the Connecticut Equine Advisory Council investigated key trail connections that currently exist in the Naugatuck River corridor area. They provided a detailed memo to COGCNV and mapped the connections in a GIS database, some of which helped the consultant team recommend spur-trail links important to equestrians.

A final public meeting was held on September 14, 2010 at COGCNV's offices in Waterbury. The completed draft study was presented to the Regional Planning Commission and members of the public in attendance. Members of the public and RPC commissions voiced support for the greenway study. One member of the public emphasized the importance of designing the greenway to not take away from the beauty of the Naugatuck River.

14. Opportunities and Challenges

Part of the community and stakeholder meetings, field work and analysis during the early stages of this Study included the documentation and analysis of existing opportunities and challenges to the development of a greenway trail within the Naugatuck River corridor in Naugatuck. This analysis is shown in the diagrammatic map, Figure 3, on the following page.

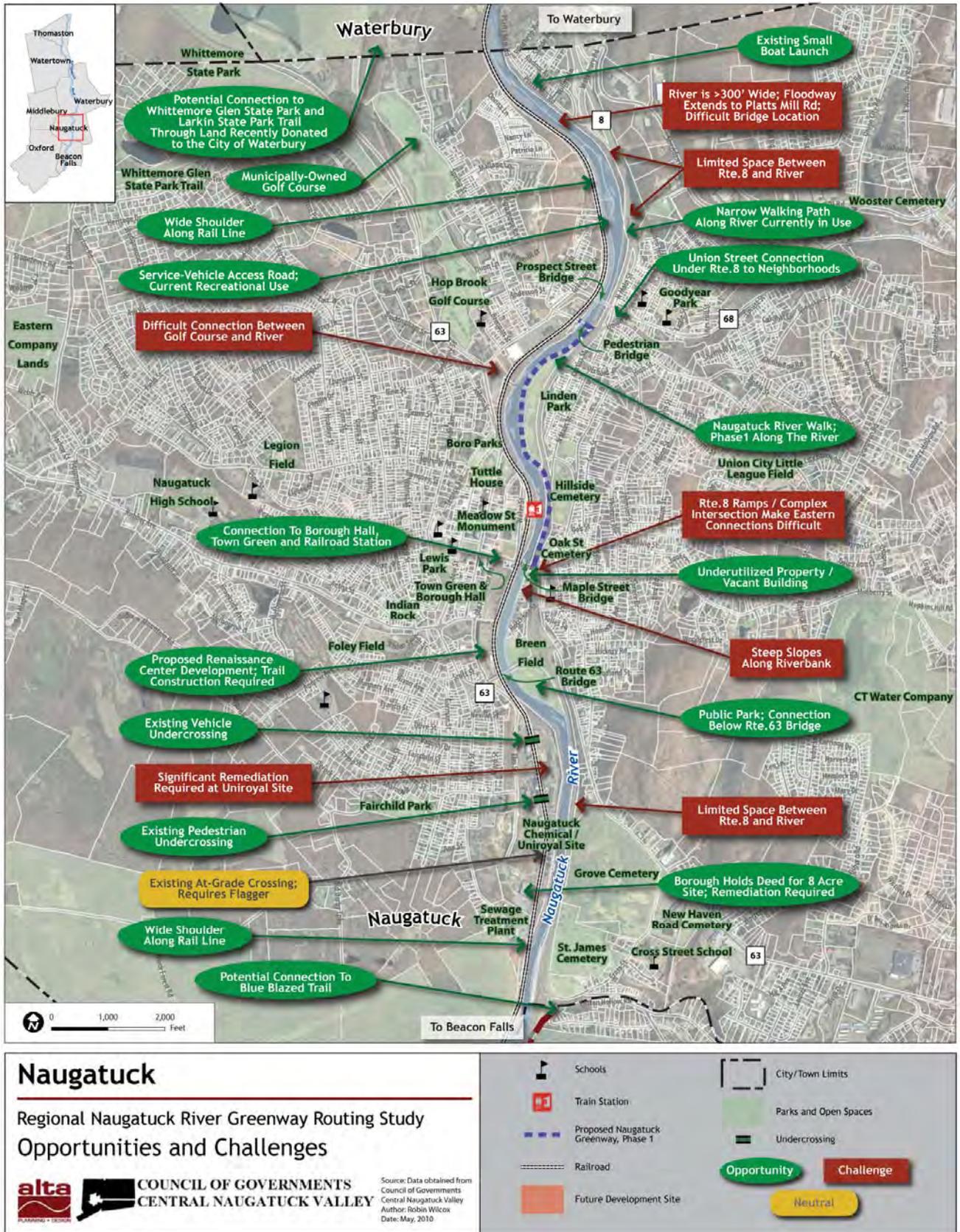
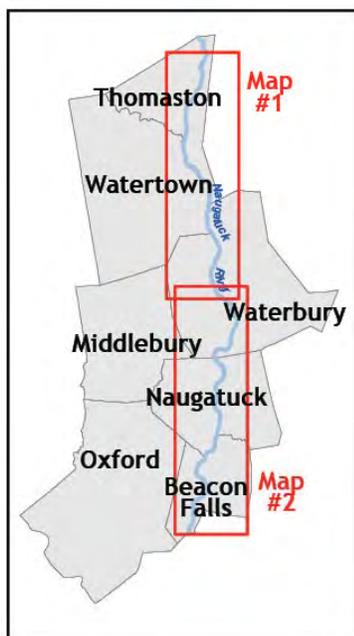


Figure 3: Opportunities and Challenges for Potential Greenway Route in Naugatuck.

15. Recommended Greenway Routing

Proposed Features

- Potential Location For New Bridge
- Improvements to Existing Bridge
- Shared Use Path or On-Street Improvements within Public ROW
- Existing or Funded Greenway Path Connection
- Shared Use Path on Public or Private Land
- Trail Along Active Rail Line Separated by Buffer
- Cantilevered Trail
- Existing or Planned Soft Surface Trail on Public or Private Land
- Town Boundary
- Railroad
- Train Station
- Boat Launch
- Rest Station
- Trailhead with Parking



Naugatuck River Greenway

Regional Naugatuck River Greenway Routing Study

Recommended Greenway Routing Concept

COUNCIL OF GOVERNMENTS
CENTRAL NAUGATUCK VALLEY



0 1000 2000 Feet
September 2010

Source: GIS data obtained from Council of Governments Central Naugatuck Valley



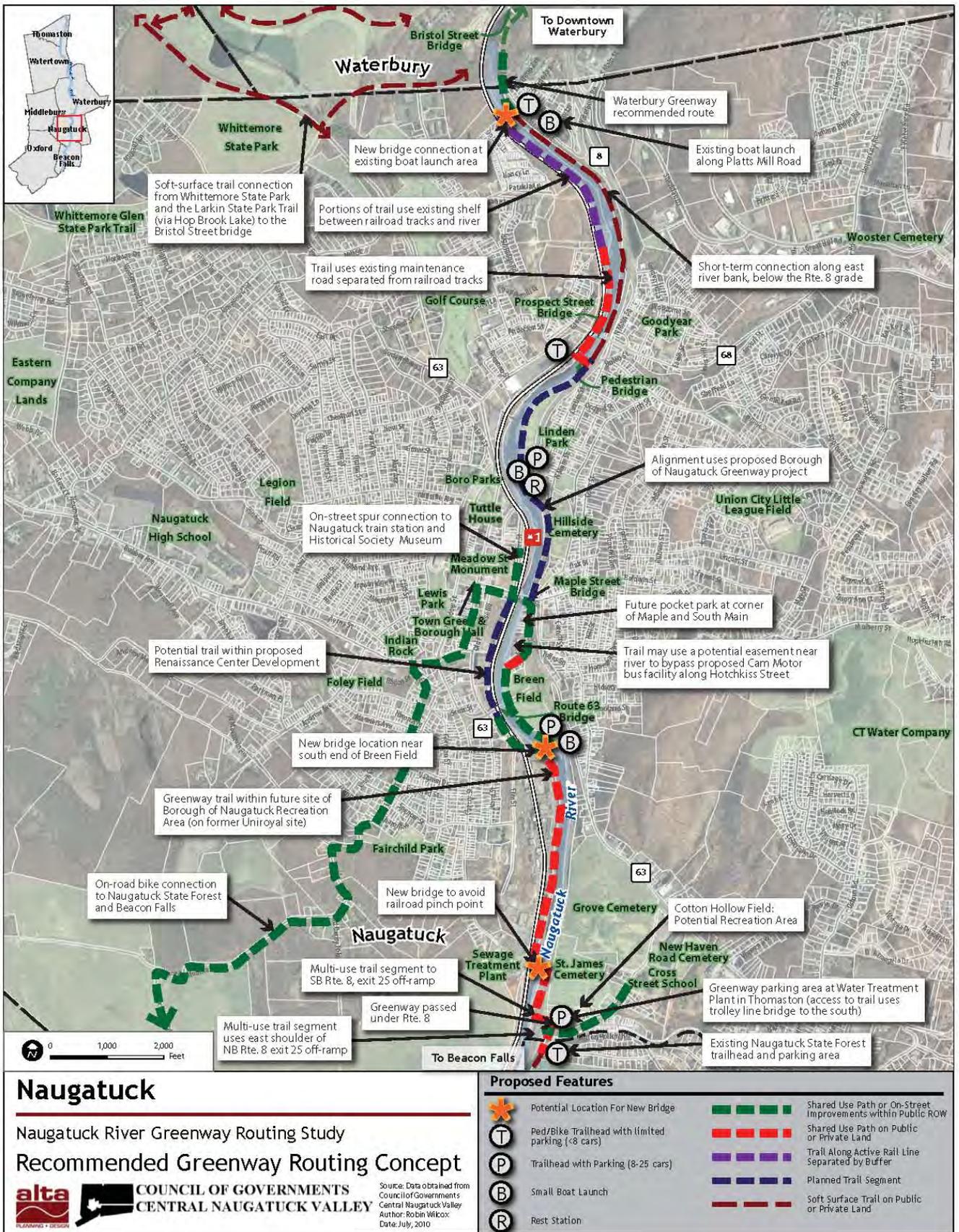


Figure 4: Recommended Greenway Routing Concept Map in Naugatuck.

Regional Naugatuck River Greenway Routing Study

The Naugatuck River Greenway (NRG) in the Borough of Naugatuck will take various forms including portions set immediately adjacent to, but separated from, existing roadways, soft-surface pathways adjacent to the river (in the short term), “rail-with-trail” portions adjacent to Metro-North, and a multi-use path running through borough parks adjacent to the river. The route will provide connections to many destinations and attractions in town: the Borough Green, railroad station, the Historical Society Museum and a number of open spaces including Linden Park, Breen Field, Naugatuck State Forest and a future recreation area on the former Uniroyal site. Trail-side amenities will be provided along the route including small parking lots, picnic areas, small boat launches (canoes and kayaks), rest stops, water fountains, public art, seating, interpretive signage and kiosks. The 3.3 miles of trail will increase non-motorized transportation options and enhance the quality of life of Naugatuck’s residents and attract new visitors. Greenway connections north to Waterbury and south to Beacon Falls will also provide safe corridors for walking and biking and encourage more non-motorized trips in and out of the borough.

A. Recommended Greenway Trail Alignment

The formal beginning of the NRG alignment in Naugatuck is the existing canoe/kayak launch along Platts Mill Road, near the Waterbury line. The 2010 Waterbury Naugatuck River Greenway Routing and Feasibility Study identifies this as the end point of the Waterbury section of the NRG. From this spot, a short-term connection to the downtown area will be provided along the east bank with an improvement to the existing dirt walking/hiking path that now runs south adjacent to Platts Mill Road and along the river’s eastern edge to the Pulaski pedestrian bridge. This path may only be passable seasonally, due to flooding by the Naugatuck River. The path also does not accommodate cyclists and is not ADA accessible, so the long-term recommendation is for a 10’ paved, multi-use path along the edge of the rail corridor on the west bank of the river.



Figure 5: Cross-section showing the greenway trail at the edge of the Metro-North rail corridor

Accessing the west bank will occur with the development of a new trail bridge from the canoe/kayak launch at Platts Mill Road to the other side of the river. In lieu of a new bridge, the greenway could use an improved south sidewalk on the Bristol Street Bridge in Waterbury to cross the river. In either case, a soft-surface trail connection between the Bristol Street bridge and Whittemore Glen State Park should be explored to help link the Larkin State Park Trail and the Middlebury Greenway (via Route 63 and Hop Brook Lake) with the NRG. The trail’s placement will be as far from the active railroad tracks as possible, 25’ from the centerline of the tracks to the edge of the trail surface is intended. This will provide the necessary space to accommodate Metro-North and CTDOT’s needs for double tracking, electrification, signals and maintenance vehicle access within the rail corridor. With or without a second track, the trail will be separated from the rail corridor by a security fence with intermittent gates for maintenance access to the tracks. The trail will be engineered to accommodate the loads of Metro-North service vehicles which will have access to the greenway for routine maintenance runs or in the case of emergencies. To minimize use of the state-owned rail corridor, the NRG in this area should incorporate a shelf of land along the river bank that was used until the mid-20th century as a trolley bed. This will allow the trail to split off from the rail corridor along some stretches and bring walkers, cyclists and other trail users closer to the edge of the river.



Figure 6: Proposed photographic simulation of the NRG trail alongside the Waterbury Branch rail line north of the Prospect Street Bridge, potentially as far north as the Bristol Street bridge in Waterbury.

As the trail approaches the Prospect Street bridge from the north, it splits off and follows an existing unpaved access road that passes under the Route 68 bridge and connects to the Polish-American Community Center at the east end of Bridge Street. This beautiful stretch of trail passes through a mature stand of trees away from the rail line and closer to the river. From the Community Center, the trail follows the alignment of the planned and funded Borough of Naugatuck Riverwalk project. This alignment crosses the river on the existing Pulaski pedestrian bridge and turns south to follow the east bank of the Naugatuck River to the Whittemore Bridge (Maple Street Bridge). Along the way, the trail proceeds along a new sidewalk/path on the edge of the Route 8 on ramp, runs through Linden Park on the existing wide paved path, past the parking lot and along a nearly ¼ mile-long sidewalk adjacent to the Route 8 off-ramp to Maple Street. This six-foot-wide sidewalk is quite narrow for a multi-use greenway trail but to widen it to a more comfortable ten feet would be prohibitively expensive for such a long

Regional Naugatuck River Greenway Routing Study

distance. Depending on the popularity of the greenway, this should be considered in any redesign or reconstruction of the Route 8 interchange.



Existing sidewalk along the Route 8 southbound off-ramp that will be incorporated into the Borough's planned Riverwalk project.

At the Whittemore Bridge, a greenway spur will split off from the primary trail across the river along Maple and Water Streets. These spurs will create pedestrian and bike connections into downtown Naugatuck and the proposed Renaissance Place mixed-use development. Streetscape improvements such as corner bump outs, improved sidewalks, ADA sidewalk ramps, street trees and lighting are incorporated into Maple and Water streets to encourage connections to the Borough Green, Borough Hall, shops and restaurants, the train station and the Historical Society Museum in the old train station building. To improve bicycle access from the greenway, bike lanes, shoulder striping and/or share-the-road signs are incorporated along Water Street and portions of Maple Street from the bridge to the Borough Green. Similar

improvements are recommended along a series of streets within the Borough to improve the cycling experience from the river corridor up to and through the Naugatuck State Forest. Until structures are built within the State Forest to enhance connectivity through this challenging section of the river valley,



Figure 7: New street trees, bike lanes and other sidewalk improvements will enhance the connection from the greenway trail to the train station along Water Street.

this on-street bike connection may be the only way to connect the greenway in Naugatuck to Beacon Falls.

From the Whittemore Bridge, the recommended greenway alignment runs along South Main Street to connect to Breen Field. Currently, the street contains one lane in each direction and parking lanes on both sides of the street. The parking along the Route 8 embankment drops on the approach to Maple Street to accommodate a left-turn lane to Maple westbound. To accommodate the greenway, the parking along the embankment should be removed entirely, the travel lanes narrowed to 11' and the existing 6' sidewalk incorporated into the trail alignment. This portion of the NRG will function like a wide sidewalk with bicycle traffic, so care will need to be taken to discourage cyclists from riding much more than walking speed (approx. 2.5 mph). To control speeds, strategically placed bollards should be incorporated along with signage. Additionally, some level of enforcement of reckless riding by Borough police will be needed to ensure a comfortable environment for all sidewalk/path users. This path segment begins at a potential park space planned for the corner of Maple and South Main, an underutilized building that the Borough has considered for demolition and transformation into a pocket park. This future park space could become the gateway into Naugatuck from the NRG trail and include benches, public art, a map kiosk, water fountain and possibly restrooms.



Former Uniroyal site, home to a future recreation park for the Borough of Naugatuck.

From South Main, the greenway route becomes a shared roadway with adjacent sidewalk along Hotchkiss Street and connects to Breen Field through the far end of the parking lot at the north end of the park. Access to this area may instead be along a section of path closer to the river. At the South Main/Hotchkiss intersection, a new school bus depot has located at the former Cam Motors site. The depot could create conflicts between trail users and buses. The Study recommends that the Borough explore the possibility of establishing a 20'-wide easement along the north and west edge of this property to accommodate a trail. This could provide a more seamless connection from South Main to the Breen Field parking area and driveway and avoid conflicts with buses.

The route through Breen Field will utilize a shared roadway as cyclists and walkers mix with slow-moving motor vehicles driving to the baseball diamonds in the park. While the intent is to minimize the removal of parking, some loss may be necessary to improve sight lines and other safety improvements for those looking to pass through the park space on foot or bike. Near the south end of the park, opposite the dividing line between the two baseball diamonds, a new bridge across the river will connect to the north end of the former Uniroyal site. This bridge could be either for trail use only or possibly for vehicle traffic as well. The Borough of

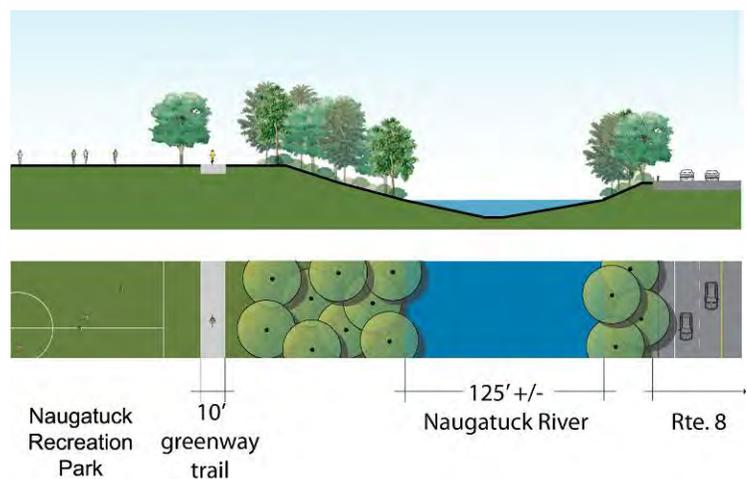


Figure 8: Site cross-section of the Naugatuck River showing the NRG on the left, adjacent to the Borough's proposed recreational fields.

Regional Naugatuck River Greenway Routing Study

Naugatuck has proposed the remediation and eventual redevelopment of this site into a recreation park with fields for soccer, football and baseball. Parking, rest rooms and other amenities are planned for the site as well. The NRG trail runs along the eastern edge of the future park, at the top of the west river bank (see cross-section, Figure 8, on previous page).

The NRG trail will pass through the new Recreational Park and run downriver to the Borough's Water Treatment Plant. As the trail approaches this spot, the rail line and the river bank converge to create a pinch point that precludes the continuation of the trail on the west bank without significant structural solutions. Such solutions could include cantilevering the path out from the river bank or elevating the trail to run over the railroad tracks. To avoid these costly solutions, the alignment will shift to the east bank of the river, incorporating a new pedestrian/bike bridge over the Naugatuck River. The trail will proceed south using the shoulder of the Route 8 exit 25 off-ramp and then pass beneath Route 8 within the existing underpass that connects to Cross Street. Along Cross Street, the ten-foot wide multi-use trail will be separated from the roadway by a landscaped buffer and include an enhanced crossing at the north end of the north bound exit 25 off-ramp. (At this location, a roundabout is proposed in the 2010 Route 8 Study. The Route 8 Study and the Regional NRG Routing Study has been coordinated to ensure that the south leg of this roundabout is designed to accommodate the crossing of the trail.) The NRG will then turn south and run along the east edge of the off-ramp and terminate at the end of the Old Route 8 roadbed, off-limits to traffic and part of the Connecticut Forest & Park Association's Blue-Blazed trail system. (To accommodate the trail on the off-ramp, the paved surface of the off ramp may need to be widened to accommodate the trail and a crash barrier.) Improvements in this area include a small kiosk with trail information and potentially a port-o-potty or composting toilet. From this trailhead, the NRG will continue along the Old Route 8 Trail through the Naugatuck State Forest into Beacon Falls, requiring a number of innovative engineering solutions to link the trail across the handful of existing cliffs, large retaining walls and steep scree fields.



Figure 9: Trail alignment at the south end of Naugatuck illustrating the proposed location for a new bridge across the Naugatuck River. (Note: Downtown Naugatuck is to the right, the State Forest to the left.)

B. Greenway Trail Alignment Options

Within this Study's recommendations, there are two locations where the proposed NRG alignment includes two potential corridors for the trail. In both instances, the alternatives are intended to indicate a short- and long-term connection for the greenway. At the north end, a short-term connection is recommended along the east bank of the river where currently, an informal dirt walking path exists near the edge of the river. Improving this trail to become an ADA-accessible, multi-use path will be difficult however, primarily due to its closeness to Route 8 and seasonal flooding of the Naugatuck River. In the long term, a fully-accessible trail is recommended to run along the existing rail corridor on the west bank of the river from the Prospect Street bridge north to a proposed bridge that will connect it to the existing canoe/kayak launch along Platts Mill Road. Additionally, roadway and sidewalk improvements are recommended along a series of streets that lead from downtown to the Naugatuck State Forest, via Lewis Street and Hunter's Mountain Road. This is intended to be a short-term connection to Beacon Falls, over the hill and through the State Forest, primarily for intrepid cyclists due to the distance and the steep topography. In the long term, options to connect through the State Forest to Beacon Falls, are recommended but will require further study due to their complexity and probable high cost.

C. Greenway Trail Characteristics

The primary goal of the NRG is to provide a continuous greenway trail through Naugatuck connecting to Waterbury and Beacon Falls for use by pedestrians, cyclists and, where possible, people using wheelchairs or other accessibility devices. In limited areas, access to equestrians is anticipated as well. Ideally, the trail will be separated from nearby roadways by a 5-10' landscaped buffer or, at a minimum, a crash barrier set within a 3'-wide grassy shoulder. This Study recommends the accommodation of all of these users for the maximum length of the trail as practicable. Some discrete locations may not accommodate ADA requirements and bicycles, at least for the short term. Ultimately, these narrow pinch points and other spots requiring significant engineering solutions should be designed to accommodate all users in a safe and comfortable environment. In some sections, "single track" natural trail surfaces for hiking, mountain biking and/or equestrian use may be the best available options. Water trail or 'blueway' options are also an important consideration so the Naugatuck River can be accessed by canoe and kayak. In Naugatuck, there are two proposed paddlecraft put-ins/take-outs in addition to the existing one along Platts Mill Road. Proposed locations include a stretch of river adjacent to the parking area at Linden Park and at the south end of Breen Field.

Within Naugatuck, most of the greenway is intended to be a 10' wide, shared-use asphalt path, with 8' widths in constrained areas. Two-foot-wide soft-surface shoulders will be included with a white shoulder line set 8-12" from the edge of the asphalt. This trail configuration is appropriate for the majority of the greenway through the Borough. If conditions permit, a four-to-six foot, soft-surface shoulder should be considered on one side of the trail to facilitate equestrians and runners looking for a more comfortable surface. Locations very close to the river or wetland areas can be a permeable or semi-permeable surface (stone dust or stabilized aggregate) to reduce storm-water runoff and make for a more "natural" appearance within environmentally sensitive areas. In Naugatuck, this condition may occur along the northern section of the alignment where the NRG trail splits off from the railroad corridor and runs along a shelf closer to the river. Along portions of South Main Street, Hotchkiss Street and the access road into Linden Park, the trail alignment will utilize existing (in some case widened) sidewalks for pedestrians, wheelchairs, and young cyclists and roadway improvements such as bike lanes, shoulders and signage for cyclists.

D. Access Points and Amenities

Access to the NRG trail will be provided at a number of parking areas and trailheads in Naugatuck. Some are existing publicly-accessible sites (such as the parking lots at Linden Park and Breen Field), while others will formalize *de facto* parking areas (such as the shoulder along Platts Mill Road near the small boat launch). All parking lots include trailheads and/or kiosks that feature maps, safety information and environmental and historical interpretive materials. To discourage trail use by ATVs and other motorized vehicles, signs and bollards will be needed at all trailheads as well. Some parking lots are located near proposed small boat launches so people can park and carry their canoes and kayaks a short distance to the river. These locations may also work well for fishing access. Locations for proposed paddlecraft boat launches include a spot adjacent to the parking lot in Linden Park and at the south end of Breen Field.



Potential location for new boat launch along river's edge in Linden Park.

Other trail-related amenities will be determined on a case-by-case basis and could include:

Rest Stations

Rest stations that include bathrooms, water fountains and lighting are important amenities that provide a more comfortable environment for greenway users, especially those with young children. A rest station is proposed at Linden Park.

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. In 2006, the COGCNV installed three interpretive signs in Linden Park along the Naugatuck River Greenway. Public health can be integrated with 'calorie counter' maps that encourage physical activity along the trail.

Pedestrian-scale Lighting

Pedestrian-scale lighting improves safety along public streets that double as the NRG route, at key intersections and at trailheads. Locations for proposed lighting improvements include the section of trail from Linden Park to the Whittemore Bridge, the spur connection to Borough Hall and up Water Street, South Main Street and the shared driveway/path through Breen Field. Lighting fixtures should be consistent with other design elements, possibly emulating a historic or cultural theme.

Seating

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 that is consistent along the entire length of the Naugatuck River Greenway will make the trail network much easier to use. Informational kiosks with maps at trailheads and other key destinations will provide enough information for someone to use the trail system with little introduction – perfect for bike commuters, tourists and local residents alike.

Public Art

Local artists should 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. In Naugatuck, public art should be considered at the primary parking lot/trailhead locations at Linden Park and Breen Field as well as at the future recreation area on the Uniroyal site.

16. Use of Rail Corridor

Throughout discrete portions of the 22-mile Naugatuck River Greenway (NRG), the recommended trail route runs within the state-owned, active rail corridor. In Naugatuck, the railroad corridor carries the Waterbury branch of the Metro-North commuter rail service and occasional freight trains. The NRG trail in Naugatuck will run within the rail corridor for approximately a mile from a spot across the river from the existing boat launch on Platts Mill Road to the Pulaski Pedestrian Bridge, though portions of the NRG will utilize an old trolley bed and unpaved access road outside of the corridor where possible (see Figure 10 below).

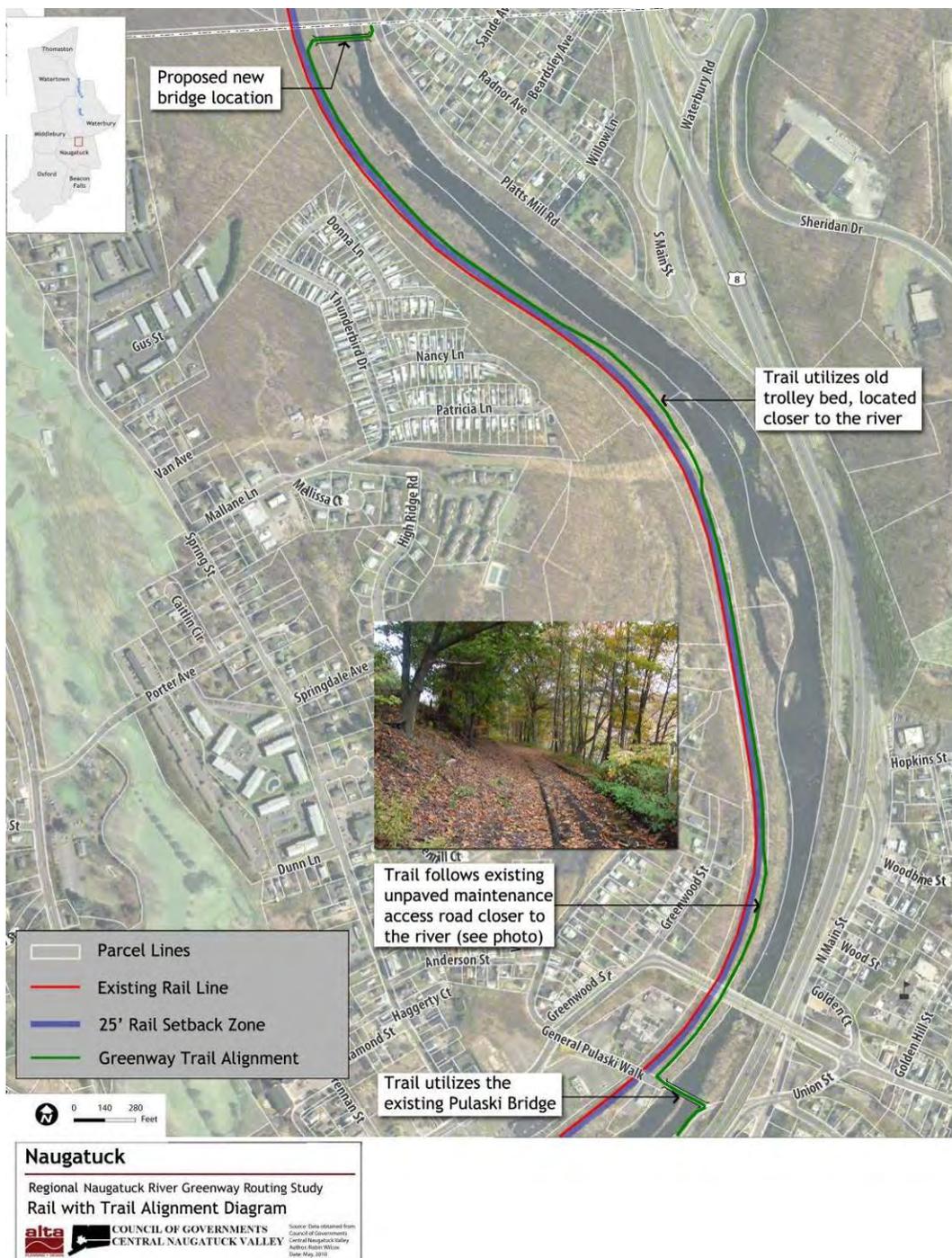


Figure 10: Rail with Trail Alignment Diagram.

Because of the use patterns of the rail line, the NRG's alignment will need to be carefully designed so as not to disrupt train service. Early on in the planning process, members of the project team met with rail operations officials from the Connecticut Department of Transportation (CTDOT) in New Haven to better understand their needs for the corridor. According to the CTDOT, the agency is open to considering having a greenway trail as long as operations are not disrupted and the following conditions are met:

- A 25' setback/buffer from the centerline of the tracks to the edge of the trail to accommodate future double tracking, rail spurs and/or electrification towers (it is important to note, however, that the CTDOT's recently completed Waterbury/New Canaan Branch Lines Study does not recommend double tracking or electrification because of high costs and limited benefits).
- Unencumbered access for service and emergency vehicles.
- A security fence with intermittent gates for maintenance access.
- A future greenway trail construction schedule that is coordinated with Metro-North's summer maintenance schedule when the Waterbury Branch rail service is suspended and replaced with buses.
- Any maintenance of the railroad corridor should be coordinated with future greenway construction for maximum efficiency of time and funding.

Many of these conditions are consistent with research conducted for the U.S. DOT's *Rail-with-Trails: Lessons Learned* document by Alta Planning + Design (see: <http://www.fhwa.dot.gov/environment/rectrails/rwt/toc.htm>). This document showed that well-designed rail-with-trail projects typically meet the operational needs of railroads. In some locations, the setback/buffer can be as low as 10' in constrained areas within rail corridors that have a low frequency and low-speed train service. Regardless of setback distance, the recommended NRG rail-with-trail portion in Naugatuck may not fit neatly on to the existing rail bed used by maintenance vehicles. Achieving the 25' setback may require the cutting of adjacent trees, re-grading of a portion of the bed and potentially building small retaining walls to accommodate the additional width. In extreme pinch points, the bare minimum setback will need to be at least 12' to accommodate maintenance vehicles and other machinery. It is also important to recognize, according to the U.S. DOT's report, that the rail-with-trail portions of the greenway can provide benefits to the rail-corridor owner and operator. This includes providing them with a new, well-maintained service corridor adjacent to the tracks (in the form of a greenway trail), and a reduction of illegal track crossings, trespassing and dumping. In addition, towns and cities have seen benefits with increased adjacent property values and enhanced access to the rail corridor by law enforcement and emergency vehicles.



Greenway trail in Portland, Oregon whose edge runs within 10-15' of the centerline of the adjacent active rail line.

17. Recommended Trail Section Limits

Two separate, but related, questions must be answered in order to develop a recommended sequence of greenway construction: What are the limits of each individual construction phase? What is the best sequence in which to complete these sections? Section limits were determined with an eye toward the following characteristics:

- **Connectivity** – Individual phases should be useful as stand-alone projects and connect to existing public rights-of-way adjacent to residential neighborhoods or an employment area.
- **Funding Availability** – The complete greenway program should be broken into reasonably-sized projects likely to attract funding.
- **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, such as at an existing public road or park.
- **Momentum Building** – Greenway sections likely to generate the greatest excitement and enthusiasm in the community should be built first.
- **Consistency of Character** – Areas in which the character remains consistent from one end to the other.

Using these criteria as a guide, recommended section limits for the Naugatuck River Greenway in Naugatuck were created and shown in Figure 11.

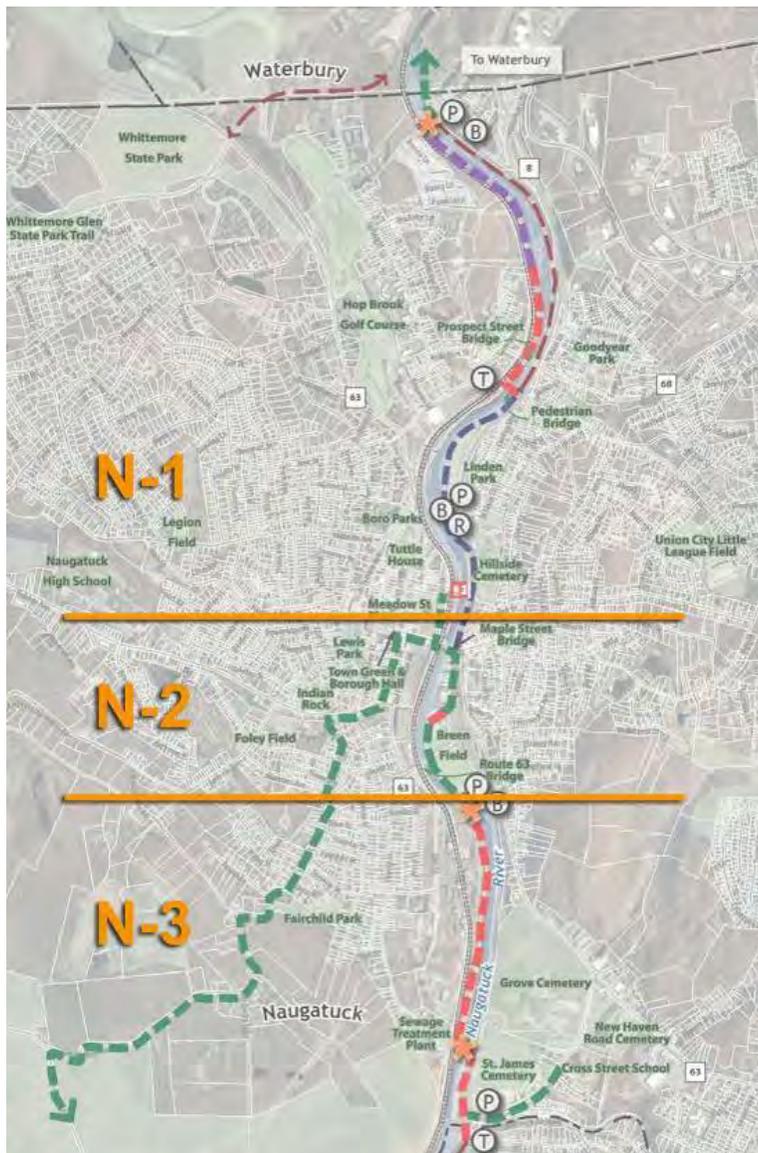


Figure 11: Naugatuck Greenway Sections.

Section	Description	Length (miles)
N-1	Waterbury Line to Pulaski Bridge	1.1
N-2	Whittemore Bridge to Breen Field	0.8
N-2	Breen Field to Beacon Falls Line	1.4
TOTAL LENGTH		3.3

18. Trail Section Prioritization

Whenever possible, greenway facilities should be developed as single construction projects or use as few phases as possible. This allows project proponents—elected officials, business interests, community groups, etc.—to realize significant cost savings by performing the design, permitting and construction administration more efficiently. However, it is quite likely that financial constraints will require the various sections of the Naugatuck River Greenway to be completed in several phases. In Naugatuck, a recommended phasing plan was created by weighing seven criteria (relative weighting of each criterion shown in parentheses) with the prioritization matrix shown in Table 1 at bottom:

1. Connectivity (25%) – Does the phase connect to existing or funded portions of the greenway, destinations, or amenities?
2. Permitting Requirements (15%) - Will the phase be easy to permit?
3. Construction Cost (10%) – Will the phase be economical to construct?
4. Ease of Construction (10%) – Will the phase create fewer disturbances to the community?
5. Private Property Impacts (15%) – Does the phase avoid private property or adversely impacting adjacent property owners?
6. Momentum Building (15%) – Will the phase generate excitement and enthusiasm within the community for the overall greenway?
7. Cultural Benefits (10%) – Are there natural, historical, environmental, recreational, or educational resources that will be accessed or protected by the phase?

Criteria	% of Evaluation	Scoring	N-1	N-2	N-3
Connectivity <i>Prioritize phases that will build the greatest connectivity</i>	25%	Connects to at least two existing or funded greenway facilities: 25 Connects to one existing or funded greenway facility or downtown area: 10-15 Long-term link needed to build regional network: 0	15	25	10
Permitting Requirements <i>Favor phases that involve fewer regulatory hurdles</i>	15%	Can be constructed with only Local Approval: 15 Requires only "General Permits" at the state or federal level: 10 Extensive individual state and federal permits required: 0	0	15	0
Construction Cost <i>Prefer phases with a lower cost per linear foot of completed trail</i>	10%	Per Linear Foot cost less than \$150: 10 Per Linear Foot cost is between \$150 and \$250: 5 Per Linear Foot cost exceeds \$250: 0	5	5	0
Ease of Construction <i>Select phases with less disturbance to local community over more invasive projects</i>	10%	Can be built with little or no inconvenience to the community: 10 Construction will create only minor inconvenience: 5 Construction will entail significant inconvenience or temporary closure of road/rails: 0	10	5	10
Property Impacts <i>Favor projects that require fewer Rights-of-Way on private property</i>	15%	Phase entails no impacts to private landowners: 15 Phase requires easements or acquisition across 1-3 private properties: 10 Phase requires easements or acquisition across >3 private properties: 0	15	10	15
Momentum Building <i>Prioritize phases that will generate the greatest excitement and enthusiasm within the community</i>	15%	Completion is likely to create significant enthusiasm within the community: 15 Completion is likely to create some enthusiasm within the community: 10 Phase serves will serve most users only after adjacent connections are made: 0	10	10	15
Cultural Benefits <i>Select phases that provide greater access to natural, historical, recreational, archeological or educational resources</i>	10%	This section contains significant cultural resources: 10 This section contains some cultural resources: 5 This section contains few cultural resources: 0	5	5	0
Total Score	100%		60	75	50

Table 1: Naugatuck Trail Section Prioritization Matrix.

19. 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 may range between \$40,000 and \$100,000 per parcel. 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 borough's land records. These services typically cost \$3,000 to \$5,000 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.

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 8-12% of the estimated construction cost. However, the actual cost of these services will vary widely depending on project phasing. To a large extent, the cost 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

Preliminary estimates of construction costs based upon the recommended greenway sections are 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 (e.g. replacing a poorly functioning intersection with a round-about)
- Standard construction methods and materials are used

These estimates were prepared using the latest revisions to the CTDOT's **Preliminary Cost Estimating Guidelines**, dated January 2010. In keeping with the CTDOT's cost estimating guidelines, the costs include a number of miscellaneous items that are based on a percentage of construction costs (e.g., maintenance and protection of traffic [4%], minor items [25%] and incidentals [21%]). These percentages

tend to be conservative estimates of actual cost. Where appropriate, adjustments to the typical unit prices were made to reflect current market conditions and the consultant team’s 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 a detailed design, they should be considered “order of magnitude” estimates. ASTM Standard E2620 defines order of magnitude as being accurate to within plus 50% or minus 30% of actual cost. 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:

- 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, quality, 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 will begin to diminish. With each round of refinement, the range of expected construction costs will become more accurately known.

20. Community Phasing Plans

The following table provides a description of phase limits, phase lengths, recommended construction priority, and estimated cost for each of the greenway trail phases in Naugatuck. (The detailed cost estimation tables and location map are provided in Appendix C.) The table and appendix are also broken down into “Primary” and “Secondary” portions, i.e. trail elements that are necessary for the completion of the primary portion of the NRG trail vs. secondary elements such as spurs, loops and streetscape improvements that are not integral to the full completion of the trail within the town limits.

Section	Description	Length (miles)	Phase	Total Cost
N-1	Waterbury Line to Pulaski Bridge	1.1	2	\$1,140,000
N-2	Whittemore Bridge to Breen Field	0.8	1	\$1,192,000
N-2	Breen Field to Beacon Falls Line	1.4	3	\$2,044,000
Total Construction Cost - Primary		3.3		\$4,376,000
Total Construction Cost – Secondary*				\$888,000

* These secondary items are highlighted on the trail segment cost estimate table on the second page of Appendix C.

21. Greenway Zoning

Greenway/River Overlay Zoning

A greenway/river overlay zone is a land use regulation established by a municipality for the purpose of protecting a linear corridor for recreational and conservation purposes. These zones have also demonstrated ancillary benefits such as spurring economic development, facilitating redevelopment of

Regional Naugatuck River Greenway Routing Study

underutilized parcels, improving flood management and water quality and preserving critical habitats.

When incorporated into municipal zoning regulations, overlay zones modify the underlying zone's bulk standards and uses. This tool can be used to encourage or dissuade various development scenarios. Relevant to greenway development, overlay zones may be used to:

- Alter setback requirements.
- Provide incentives in the form of higher development density in exchange for public access to a greenway or river corridor.
- Provide incentives for granting easements or providing related amenities for the greenway.
- Stipulate landscaping requirements.
- Require construction of greenway segments as a condition of site development.

Excellent examples of the greenway overlay zoning that have served as model ordinances for communities across the nation include:

- Portland, OR - <http://www.portlandonline.com/bds/index.cfm?a=53351> (Chapter 33.440 of the Portland Zoning Regulations)
- Davidson, NC - <http://www.ci.davidson.nc.us/DocumentView.aspx?DID=1304> (Section 11 of the Town of Davidson Planning Ordinance)

Riparian Habitat Zones

A riparian habitat ordinance is narrowly focused on protecting the unique habitat present along stream channels and wetland areas. Unlike the Greenway and River Overlay zones described above, a riparian habitat zone does not contain specific requirements for public access or accommodation of a greenway and can be used in areas adjacent to the NRG or along tributaries of the Naugatuck River. Elements of effective riparian habitat ordinances include:

- Defines a protected buffer.
- Requires a written plan for the protection of the resource.
- Requires approval of mitigation measures as a condition of project approval.

An example riparian habitat ordinance from Napa, California can be found at the National Center for Appropriate Technology's (NCAT) Smart Communities Network website: www.smartcommunities.ncat.org/codes/napaord.shtml. This site is a clearinghouse for sustainable development and energy conservation ideas.

Complete Streets

Complete streets are designed and operated to enable safe access for all users.¹ The State of Connecticut enacted Public Act 09-154 in June of 2009, "An Act Improving Bicycle and Pedestrian Access". This law requires transportation planners to accommodate all users as "a routine part of the planning, design construction and operating activities of all highways..." This change in focus from *car*-centric to *user*-

¹ National Complete Streets Coalition, "Complete Streets FAQ." 2009.<http://www.completestreets.org/complete-streets-fundamentals/complete-streets-faq/> (accessed May 19, 2010).

centric planning helps create safer, healthier, greener and more livable communities. The law also mandates that at least 1% of highway funding be spent on pedestrian and bicycle facilities.

Many municipalities are choosing to formalize their commitment to include all users in the transportation planning process by adopting Complete Streets ordinances. Whereas the overlay zoning regulations described above focus on protecting undeveloped or underdeveloped corridors, Complete Streets ordinances focus on improving facilities within public rights-of-way. Several excellent examples of successful municipal ordinances can be found at www.completestreets.org/webdocs/policy/cs-chart-samplepolicy.pdf

An ideal complete streets policy

- Includes a vision for the community's complete streets.
- Defines 'all users.'
- Encourages street connectivity for all modes.
- Is adoptable by all agencies to cover all roads.
- Applies to both new and retrofit projects.
- Makes exceptions specific and requires approval of exceptions.
- Directs the use of the latest and best design standards.
- Complements the context of the community.
- Establishes performance standards with measurable outcomes.
- Includes specific next steps for implementation of the policy.

Adopted from National Complete Streets Coalition

22. 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. Land donations or town public works crew's labor may be counted as local match under some funding programs.

Community leaders and elected officials from Naugatuck 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 lists 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 match for state and federal funding program. Naugatuck voters approved funding a portion of the greenway trail from Linden Park to the pedestrian bridge through bonding.

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 non-profit 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 the municipal general funds, private grants and gifts.

Adopt-A-Trail Programs

These programs are often administered by a local greenway commission and 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 housekeeping needs.

Federal Transportation Bill

The Congress appropriates funding for federal transportation projects every 5 years. The federal transportation bill has been the primary source for greenways construction money in recent years. Various funding programs within the legislation relate to greenway development, including the High Priority Projects (commonly referred to as “earmarks”), Recreational Trails, and Safe Routes to Schools programs. These funds are administered through the Connecticut DOT and the Connecticut DEP. The current iteration of the federal Transportation Bill, the 2005 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) expired on September 30, 2009. Funding has been continued by continuing resolutions until the next federal transportation bill is approved. The next transportation bill is currently being developed by Congress. This presents an opportunity for municipalities to discuss greenway funding under the High Priority Projects program with their representatives in Congress.

Recreational Trails Program

These annual grants are available to government and non-profit agencies, for amounts ranging from \$5,000 to \$50,000 or more, for the building of trails. It is a reimbursement grant program (sponsor must fund 100% of the project up front) and requires a 20% local match. These grants are authorized by the SAFETEA-LU (reauthorization in progress, see above), and in Connecticut they are administered by the Department of Environmental Protection (CTDEP).

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-percent local contribution. Agencies can receive up to \$50,000.

23. Next Steps

The Regional Naugatuck River Greenway Routing Study is just the first step in the development of the Naugatuck River Greenway (NRG) in Naugatuck. The NRG will be a long-term, multi-phase project led by all of the municipalities in the corridor, in cooperation with state and federal agencies. It will require the continued involvement of members of the public, elected officials at all levels of government and community groups in order to support and guide the implementation effort. The following ‘next steps’ are recommended in order to move the effort forward in a sustainable fashion:

- **Adopt the Study:** The City of Waterbury has recently adopted its plan for the portion of the NRG that runs through the city. Naugatuck could do the same and amend their Plan of Conservation and Development to incorporate the greenway alignment. The Borough could also pursue endorsement of the Study by their Planning and Zoning Commissions, Economic Development Commission and Parks Commission.
- **Create the Right-of-Way:** This will ensure that the proposed alignment for the trail is gradually assembled and made available for public access. This can be accomplished by using:
 - New zoning regulations to ensure that the greenway is accommodated into redevelopment proposals along the alignment (see Greenway Zoning section of the report for more detail). A greenway overlay district, in particular, can be an effective tool for Naugatuck to require that trail facilities are integrated into redevelopment projects. A greenway district could also shape the quality of the development by ensuring that only uses compatible to the greenway can be located along side of it.
 - Solicitations of easement or outright ownership should also be considered when key privately-owned parcels are on the market. This is especially critical for properties that may be for sale along South Main Street between Maple Street and Hotchkiss. Here, the NRG could benefit if some (or eventually) all of the parcels were in public ownership, allowing a wider buffer along South Main and/or a possible easement closer to the river.
 - Begin negotiations with public agencies to ensure that all necessary approvals and permits are completed in order to create an easement across public lands. This can be a lengthy process, especially in areas of environmental sensitivity or at brownfield sites. Stretches of the NRG that permit access to equestrians will need to be considered by the Borough as well.
- **Find Project “Champions” to Raise Awareness and Money:** The Borough should identify an individual, commission or committee to oversee subsequent steps in the design, funding and implementation process for the greenway. (The involvement of the local business community and/or Chamber of Commerce will be critical as well.) This will ensure continuity of effort even as elected officials or Mayoral administrations change. Fundraising, in particular, is an important component that should begin immediately. Available funding opportunities including: federal transportation funds, regional TIP funding (via COGCNV), economic stimulus grants, national recreational trails grants, and state open space grants should be pursued on an annual basis to ensure success (see Funding Sources section of the report for more detail).
- **Establish a Public-Private-Non-Profit Partnership:** Establishment of a “Friends of the NRG” non-profit organization can be an effective advocate for the project. In conjunction with the project “Champion”, 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.

- **Find “Early Win” Projects:** Support for continued action at the local level will grow out of small successes that move the project or individual pieces of 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. Development of maps and other NRG promotional material will help to publicize the future trail and build excitement. Celebrating every opportunity, no matter how small, can be just as important as a major ribbon cutting for the finished project.
- **Negotiate with the CTDOT:** Town planners and future design consultants will need to work closely with the Connecticut Department of Transportation to:
 - Ensure that the needs of the railroad corridor and commuter-rail service are met. In particular, coordination with the CTDOT on the federally-mandated Positive Train Control (PTC) Plan will be necessary to ensure that this PTC Plan does not preclude the greenway’s routing and incorporates the trail’s recommended alignment.
 - Coordinate with the Highway Division on the use of state highway rights of way. The NRG alignment utilizes a portion of the shoulder of Route 8 southbound exits 28, 27 and 25 on/off-ramp and the CTDOT will need assurance that greenway users will be prevented from accessing the highway. Additionally, coordination may be required in the event that the proposed roundabout along Cross Street at exit 25 is funded. Here, the geometry and design of the roundabout may need some minor changes to accommodate the NRG along the south leg.

With these actions moving forward, the Naugatuck River Greenway will be a significant asset for Naugatuck’s residents, businesses and visitors. The trail will enhance non-motorized transportation opportunities and bring a recreational amenity that rivals any within the state of Connecticut.

Appendices

Appendix A - Community Input Detailed

A key component of the Council of Governments of the Central Naugatuck Valley (COGCNV) and the consultant team's efforts was community involvement and seeking input on the identification of a feasible greenway routing.

After a number of years of inactivity, the Regional Naugatuck River Greenway Committee (RNRGC) was reconvened to help steer routing study. Representatives on RNRGC included officials from Thomaston, Watertown, Waterbury, Naugatuck and Beacon Falls as well as representatives from state and federal agencies, such as Connecticut DOT and DEP, National Parks Service and the Army Corps of Engineers. Staff members of two U.S. Representatives that represent the Naugatuck River Valley were also on the committee. The committee met every six to eight weeks and all meetings were open to the public. The RNRGC played an important role in guiding the direction of the routing study and in keeping municipalities, government agencies and U.S. Representatives informed about study progress.

Supplementing the RNRGC input was a series of public workshops. One workshop was held in each of the four study communities. The first two public workshops were held on November 17 and 18, 2009 in Naugatuck and Thomaston, respectively. The purpose of the first set of workshops was to gather input from all four communities to assist in determining opportunities and challenges along the corridor and potential routing options for the greenway trail. The meeting on the 17th was focused on the issues and routing in both Naugatuck and Beacon Falls, while the next night, discussion focused on the issues and routing in Watertown and Thomaston.

The second two public workshops were held on March 23 and 24, 2010 in Beacon Falls and Watertown, respectively. The purpose of the meeting was to gather input from the four communities on the proposed preliminary routing as well as areas where they would like to see additional amenities along the Naugatuck River Greenway.

Overall, these four community workshops, combined with other stakeholder meetings and site walks, provided COGCNV and the consultant team with valuable input on routing recommendations, design options and property-ownership issues. The team also learned of the important local connections to adjacent neighborhoods and commercial areas outside of the corridor. Additional trail spurs and other connections were added to the recommendations as a result. One attendee even suggested the clever idea of using the 22-mile greenway, plus some spurs, as the route for the Naugatuck River Marathon in the future.

Draft routing maps and study reports were also posted on the project website which was established at the beginning of the process and maintained until the very end of the process. Comments on the greenway routing maps were received at the workshops, via email, and by U.S. Mail.

Press releases were published for both sets of workshops in the Republican American and weekly town papers. Articles were written and published on the workshops, including references to the project website. Video of the Thomaston workshop was posted to the Republican American website.

The second half of each workshop featured a small-group exercise. Using large maps as references, community members were asked to discuss the following questions and mark up the maps with their suggestions, ideas and concerns.

1. What are the key places/destinations that the Greenway trail should connect to?
2. Where are the critical gaps between these places and the Naugatuck River?
3. Where along the river are the best places for amenities *besides* a trail, such as a small boat launch, a picnic area, parking, rest station, etc.
4. What are your comments on the draft recommended routing?
5. Where along the proposed greenway are the best places for amenities besides a trail, such as a small boat launch, a picnic area, parking, rest station, etc.?

Each meeting wrapped up after the smaller groups reported back to the entire group with their comments on local conditions as well as recommendations for potential routing options and the placement and nature of greenway amenities.

Subsequent to the four community workshops, members of the Connecticut Horse Council and the Connecticut Equine Advisory Council investigated key trail connections that currently exist in the Naugatuck River corridor area. They provided a detailed memo to COGCNV and mapped the connections in a GIS database, some of which helped the consultant team recommend spur-trail links important to equestrians.

A meeting was also held with representatives of the Railroad Museum of New England, the operator of the Naugatuck Railroad. They explained their future plans for the museum and support for the greenway project. The museum representatives also explained their safety concerns and maintenance requirements for the rail with trails sections of the greenway route.

After comments were gathered from the workshops and other key stakeholders, draft reports for the four municipalities and the overall region were written and made available for public comment. Printed copies were available at Town Clerks' offices as well as at the Thomaston, Watertown, Naugatuck and Beacon Falls public libraries. The project web site included links to electronic copies of the draft reports.

A fifth and final public meeting was held in Waterbury on September 14, 2010, in conjunction with the monthly meeting of the Regional Planning Commission. This provided a final opportunity for the public to weigh-in on the final draft recommendations of the Greenway Routing Study. During the month of October, public presentations of the final recommendations were made in Thomaston, Watertown, Naugatuck and Beacon Falls. (The alignment for the Naugatuck River Greenway in Waterbury had been determined in an earlier study and adopted in early 2010.) These gave their respective communities and elected officials the opportunity to see the final recommendations in a Powerpoint slideshow format. Simultaneously, electronic copies of the final reports for the individual municipalities as well as the Regional Report and Executive Summary were made available on the project website.

Appendix B - Land Parcel Inventory and Maps

ID	Owner's Name	Parcel Location	Land Use	Map/ Block Lot	Parcel Area (Acres)
1				002-001-0014	39.728
2	O & G INDUSTRIES	RAILROAD AVE	INDUSTRIAL GENERAL	007-002-0018	35.637
3				009-001-0002&1	0.698
4				003-002-0040	5.998
5	O & G INDUSTRIES	RAILROAD AVE	INDUSTRIAL GENERAL	007-002-0017	3.043
6	ONE ELEVEN RAILROAD AVENUE	111 RAILROAD AVE	INDUSTRIAL GENERAL	007-002-0016	2.061
7	CONN LIGHT & POWER CO	180 COLD SPRING RD	INDUSTRIAL GENERAL	005-001-0005	9.329
8				007-001-0001	17.364
9				007-001-0001-A	5.366
10	CARROLL GEORGE T	CLARK LN		016-001-0001	105.254
11				016-001-0001-A	25.149
12				002-001-0012	67.950
13				014-001-0061	615.338
14				014-001-0001	0.42
15				014-001-0002	1.42

Table 2: Land Parcel Inventory (see maps on following pages).

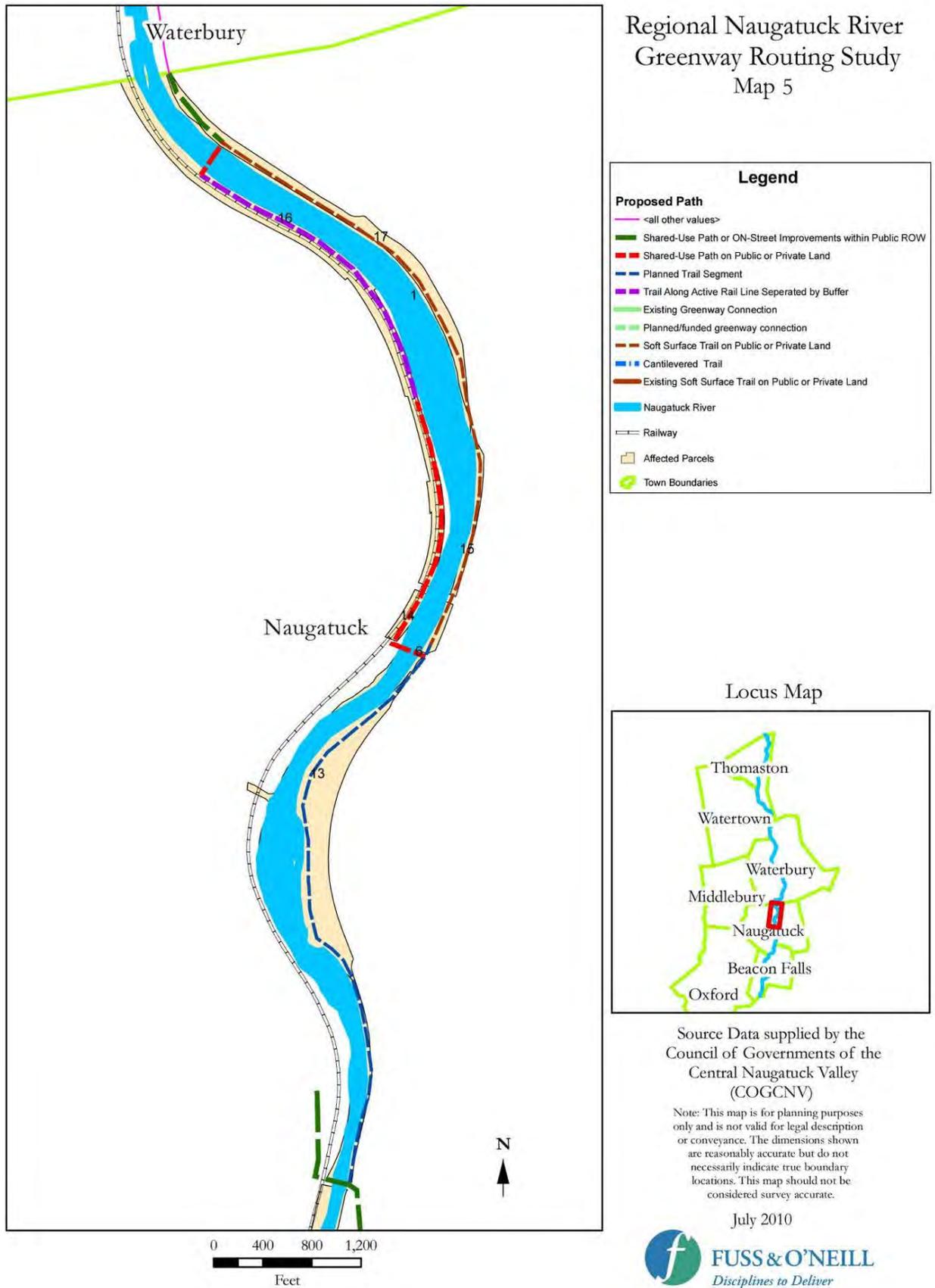


Figure 12: Land Parcel Inventory Map 5 for Naugatuck

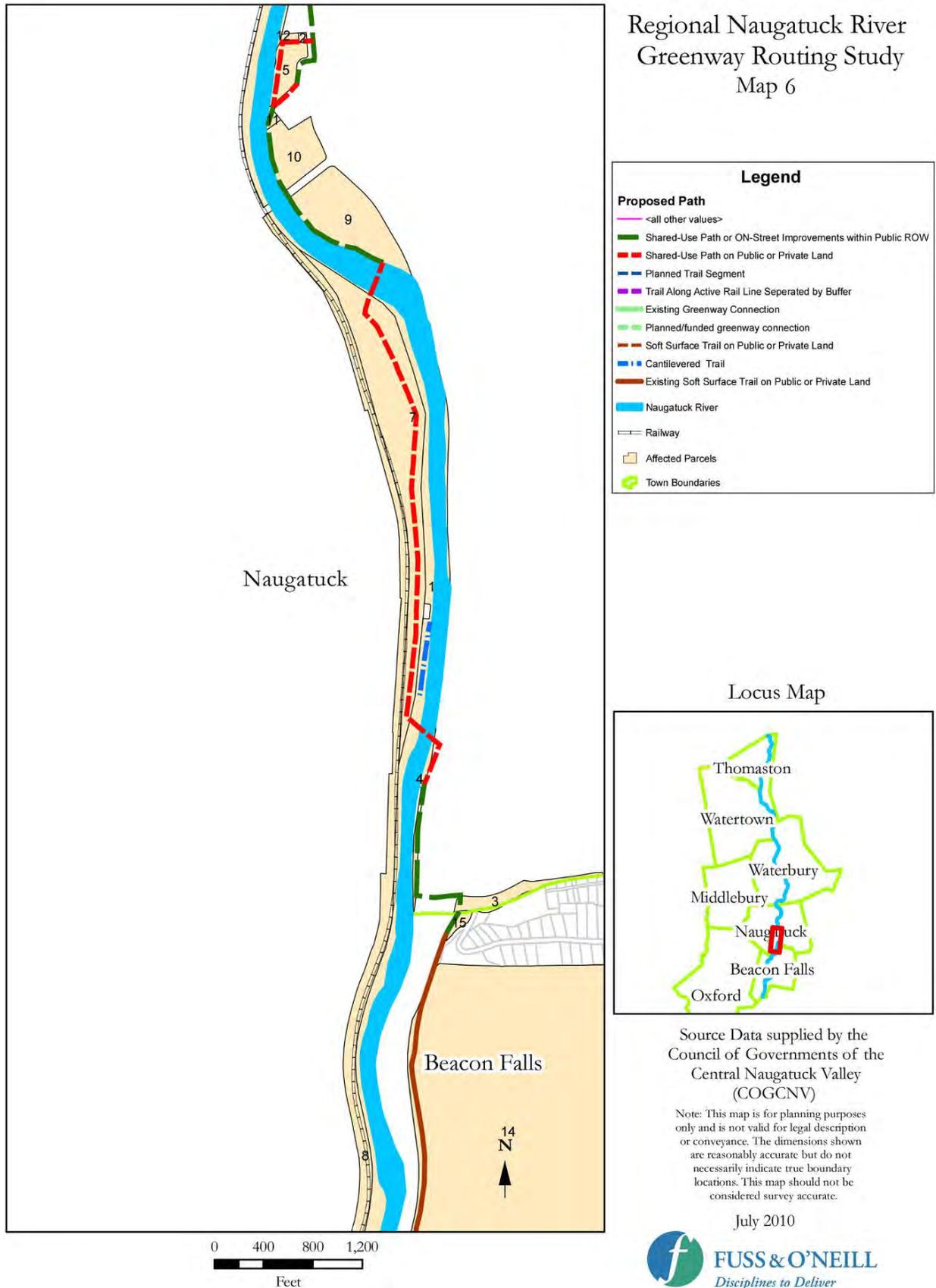


Figure 13: Land Parcel Inventory Map 6 for Naugatuck/Beacon Falls

Appendix C - Detailed Cost Estimate Tables

Preliminary estimates of construction costs based upon the recommended greenway sections are described in this appendix. 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 (e.g. replacing a poorly functioning intersection with a round-about)
- Standard construction methods and materials are used

These estimates were prepared using the latest revisions to the CTDOT's **Preliminary Cost Estimating Guidelines**, dated January 2010. In keeping with CTDOT's cost estimating guidelines, the costs include a number of miscellaneous items that are based on a percentage of construction costs (e.g., maintenance and protection of traffic [4%], minor items [25%] and incidentals [21%]). These percentages tend to be conservative estimates of actual cost. Cost estimates can also be impacted when a local public works department carries out the work. In these cases, some of CTDOT's estimated add-ons would not apply. Where appropriate, adjustments to the typical unit prices were made to reflect current market conditions and the consultant team's experience with other greenway construction projects. The guidelines were supplemented where necessary for atypical items (e.g., pre-fabricated pedestrian bridges, boat launches, etc.).

Regional Naugatuck River Greenway
Routing And Feasibility Study

Town of Naugatuck, Connecticut

Trail Descriptions of Each Trail Segment
North to South

#	SECTION	SEGMENT	APPROX LENGTH	SEGMENT DESCRIPTION	COST
Naugatuck - Start (North)					
1	N-1	Shared-Use in ROW	530	10' width - from Waterbury townline to Waterbury Rd crossing Rt.8	\$ 170,300
2	N-1	New Bridge	90	10' width - new bridge over River at existing boat launch area	\$ 340,600
3		Soft Surface Trail	5330	10' width - short term connection along east river bank, below the Rt.8 grade, ends at 2nd pedestrian bridge (no cost, assumed to be completed with volunteer work)	\$ -
4	N-1	Trail Along Active Rail	2990	10' width - trail between RR (W) and River (E) - with barrier - from existing boat launch area	\$ 432,300
5	N-1	Shared-Use Off-Street	2180	10' width - trail between RR (W) and River (E) - ends at 2nd Pedestrian bridge crossing	\$ 196,500
6		Path Along Existing Bridge	150	improvements to existing pedestrian bridge for walk - bridge is south of Rt.88 bridge (no cost, budget for segment previously determined by Borough of Naugatuck) (SECONDARY)	-
7		Planned Trail Segment	4960	10' width - new structure supported on east River bank - from pedestrian bridge to Maple Street bridge (\$5000 cost for signage only, budget for segment previously determined by Borough of Naugatuck) (SECONDARY)	\$ 5,000
8	N-2	Shared-Use in ROW	2190	10' width - from Maple St. bridge to segment North of Breen Field rec.park - includes segment near transit center	\$ 694,300
9	N-2	Shared-Use Off-Street	320	10' width - crossing just North of Breen Field rec.park	\$ 26,200
10	N-2	Shared-Use in ROW	1500	10' width - from segment North of Breen Field rec.park to new bridge south of Breen Field	\$ 471,600
11	N-3	New Bridge	180	10' wide - pedestrian bridge South end of Breen Field	\$ 615,700
12	N-3	Shared-Use Off-Street	5220	10' width - from bridge South of Breen Field to Naug./Beacon Falls townline	\$ 471,600
13	N-3	New Bridge	90	10' width - new bridge over River at RR pinch point - near sewage plant	\$ 379,900
14(a)		Shared-Use in ROW	900	10' width - on street spur connection to the Naugatuck train station and Historical Society Museum (SECONDARY)	\$ 327,500
14(b)		Shared-Use in ROW	19500	10' width - spur to the west near Maple St. Bridge (signed roadway trail to Naugatuck State Forest) (cost range of \$5,000-\$50,000 for signage) (SECONDARY)	\$ 5,000
15	N-3	Shared-Use in ROW	1820	10' width - spur East between parking lots - ends at Cross St. School	\$ 576,400
16		Planned Trail Segment		10' width - potential trial connection west of River, through the potential Renaissance Center redev. project (no cost, paid for by others) (SECONDARY)	\$ -
Naugatuck - End (South)					
TOTAL LENGTH:			41720	ft	
(grey segments are not included)			7.90	mi	
	MISC ITEMS	NUMBER REQ	DESCRIPTION		COST
T	Ped / Bike Trailhead	3	Informational Kiosk with maps/branding/parking		\$ 39,300
B	Small Boat Launch	2	Walk-in / Walk-out launch for canoes and kayaks		\$ 13,100
R	Rest Area	1			\$ 13,100
TC	Transit Center	1	Various connections to Transit Center		\$ 117,900
Park(L)	Park / Open Space (Large)	1	Cotton Hollow Field recreation area		\$ 222,700
Park(S)	Park / Open Space (Small)	1	Park at corner of Maple and South Main St.		\$ 144,100

Note:

- 1) Items highlighted in Gray represent optional routing of the trail. These items are not included in the cost summary.
- 2) Items highlighted in Blue represent "Secondary Loops and Connections" that are not critical to completing the greenway route.

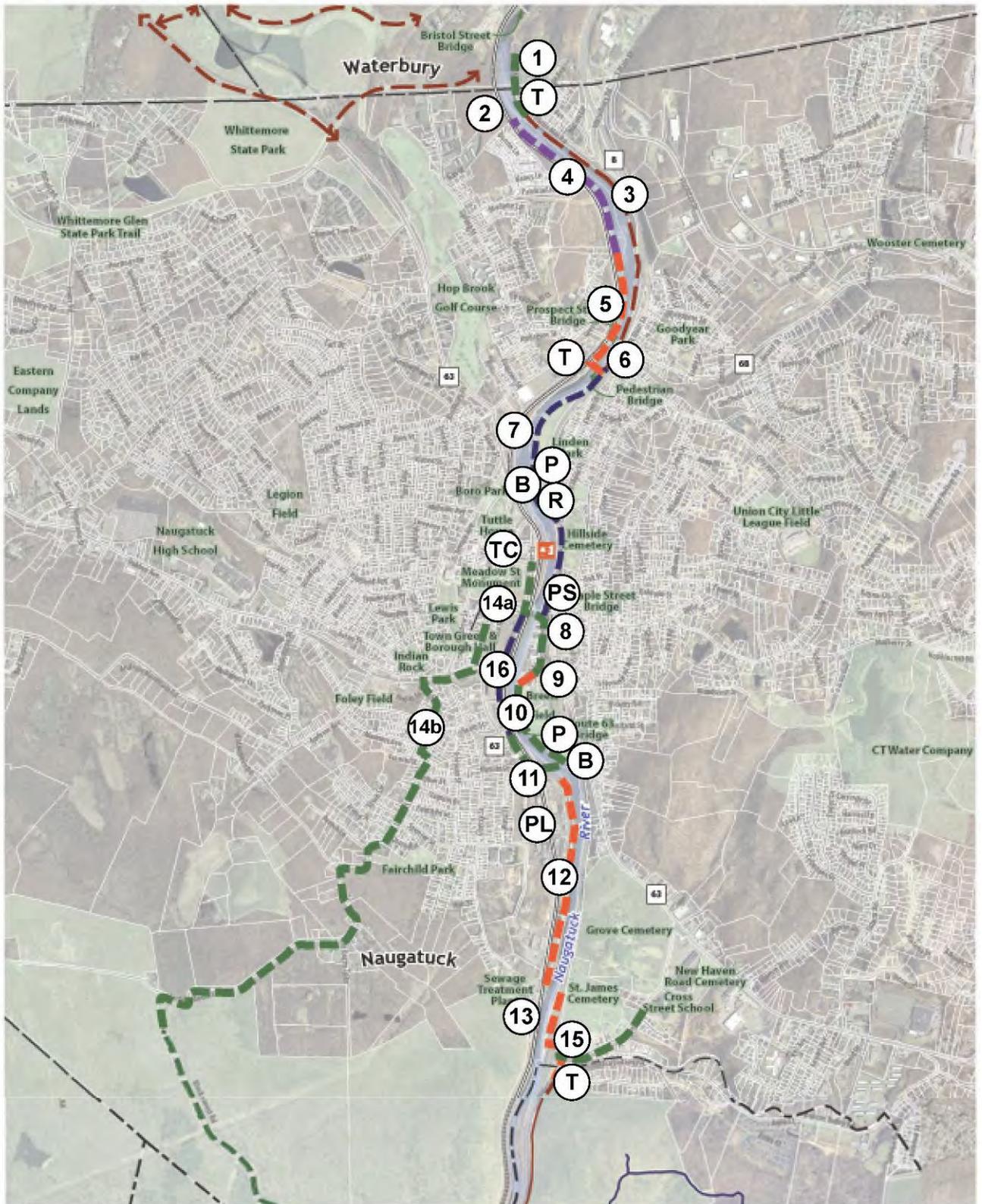
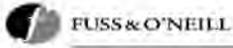


Figure 14: Trail Segment Cost Estimate Location Diagram in Naugatuck.



**Regional Naugatuck River Greenway
Routing And Feasibility Study**

Town of Naugatuck, Connecticut

*Engineer's Order of Magnitude Opinion of Probable Construction Cost
Summary by Recommended Section*

Section	Description	Length (miles)	Total Cost
N-1	Waterbury Line to Pulaski Bridge	1.1	\$1,140,000
N-2	Maple Street Bridge to Breen Field	0.8	\$1,192,000
N-3	Breen Field to Beacon Falls Line	1.4	\$2,044,000
	Total Construction Cost Primary Greenway	3.3	\$4,376,000
	Total Construction Cost Secondary Loops and Connections		\$888,000

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: 12" Type: Shared-Use in ROW From Sta: To Sta: A length of 530 Feet as shown on the plans			
Segment No.	Segment Description	Price Base Yr 2010			
#1	10' width - from Waterbury townline to Waterbury Rd crossing Rt.8				
Roadway Items		Est. Quant.	Unit	Unit Price	Total
	earth excavation	530	LF	\$14.00	\$7,420
	processed aggregate	530	LF	\$17.00	\$9,010
	Steel-Backed Timber Guide Rail	530	LF	\$125.00	\$66,250
	superpave	530	LF	\$20.00	\$10,600
Contract Items		SUBTOTAL			\$93,300
	Clearing and Grubbing Roadway		2.0%		\$1,900
	M & P of Traffic		4.0%		\$3,700
	Mobilization		7.5%		\$7,000
	Construction Staking		1.0%		\$900
	Minor Items (Applied to Roadway Items only)		25.0%		\$21,500
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$130,000
	INCIDENTALS		21.0%		\$27,300
	CONTINGENCIES		10%		\$13,000
		TOTAL ESTIMATED COST			\$170,300
Estimated By: VC Checked By: Date of Estimate: 05/18/2010					

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: Type: New Bridge From Sta: To Sta: A length of 90 Feet as shown on the plans			
Segment No.	Segment Description				
#2	10' width - new bridge over River at existing boat launch area	Price Base Yr	2010		
Roadway Items		Est. Quant.	Unit	Unit Price	Total
	Class A Conc (new piers / abutt)	3	EA	\$25,000.00	\$75,000
	pre-fabricated ped steel truss bridge	90	LF	\$1,500.00	\$135,000
	water handling	1	LS	\$20,000.00	\$20,000
	Crane	1	LS	\$8,000.00	\$8,000
Contract Items		SUBTOTAL			\$238,000
	Clearing and Grubbing Roadway		2.0%		\$4,800
	M & P of Traffic		0.0%		\$0
	Mobilization		7.5%		\$17,900
	Construction Staking		1.0%		\$2,400
	Minor Items (Applied to Roadway Items only)		0.0%		\$0
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$260,000
	INCIDENTALS		21.0%		\$54,600
	CONTINGENCIES		10%		\$26,000
		TOTAL ESTIMATED COST			\$340,600
Estimated By VC Checked By:					
Date of Estimate: 05/18/2010					

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 truss bridge, with synthetic lumber decking and a single clear span of 90 feet.

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: Type: Soft Surface Trail From Sta: To Sta: A length of 5,330 Feet as shown on the plans			
Segment No.	Segment Description	Price Base Yr: 2010			
#3	10' width - short term connection along east river bank, below the Rt.8 grade, ends at 2nd pedestrian bridge (no cost, assumed to be completed with volunteer work)				
Roadway Items		Est. Quant.	Unit	Unit Price	Total
Stone screening		5,330	LF	\$10.00	\$53,300
Clearing and Grubbing		5,330	LF	\$3.00	\$15,990
Contract Items		SUBTOTAL			\$69,300
M & P of Traffic		4.0%			\$2,800
Mobilization		7.5%			\$5,200
Construction Staking		1.0%			\$700
Minor Items (Applied to Roadway Items only)		25.0%			\$0
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$80,000
INCIDENTALS		21.0%			\$16,800
CONTINGENCIES		10%			\$8,000
		TOTAL ESTIMATED COST			\$0
Estimated By: VC Checked By: Date of Estimate: 05/18/2010					

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: 12" Type: Trail Along Active Rail From Sta: To Sta: A length of 2,990 Feet as shown on the plans			
Segment No.	Segment Description	Price Base Yr 2010			
#4	10' width - trail between RR (W) and River (E) - with barrier - from existing boat launch area				
Roadway Items		Est. Quant	Unit	Unit Price	Total
	earth excavation	2,990	LF	\$14.00	\$41,860
	processed aggregate	2,990	LF	\$17.00	\$50,830
	superpave	2,990	LF	\$20.00	\$59,800
	black vinyl chain link fence	2,990	LF	\$30.00	\$89,700
Contract Items		SUBTOTAL			\$242,200
	Clearing and Grubbing Roadway		5.0%		\$12,100
	M & P of Traffic		4.0%		\$9,700
	Mobilization		7.5%		\$18,200
	Construction Staking		1.0%		\$2,400
	Minor Items (Applied to Roadway Items only)		25.0%		\$50,100
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$330,000
	INCIDENTALS		21.0%		\$69,300
	CONTINGENCIES		10%		\$33,000
		TOTAL ESTIMATED COST			\$432,300
Estimated By: VC Checked By: Date of Estimate: 05/18/2010					

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.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		
Segment No.	Segment Description	Price Base Yr: 2010		
#5	10' width - trail between RR (W) and River (E) - ends at 2nd Pedestrian bridge crossing			
Roadway Items		Est. Quant.	Unit	Unit Price
earth excavation		2,180	LF	\$14.00
processed aggregate		2,180	LF	\$17.00
superpave		2,180	LF	\$20.00
				\$43,600
Contract Items				SUBTOTAL
Clearing and Grubbing Roadway			5.0%	\$5,600
M & P of Traffic			4.0%	\$4,400
Mobilization			7.5%	\$8,300
Construction Staking			1.0%	\$1,100
Minor Items (Applied to Roadway Items only)			25.0%	\$20,200
Contingencies & Incidentals				CONSTRUCTION TOTAL
INCIDENTALS			21.0%	\$31,500
CONTINGENCIES			10%	\$15,000
				TOTAL ESTIMATED COST
				\$196,500
Estimated By: VC				
Checked By:				
Date of Estimate: 05/18/2010				

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: Type: Path Along Existing Bridge From Sta: To Sta: A length of 150 Feet as shown on the plans			
Segment No.	Segment Description				
#6	improvements to existing pedestrian bridge for walk - bridge is south of Rt.68 bridge (no cost, budget for segment previously determined by Borough of Naugatuck) (SECONDARY)	Price Base Yr 2010			
Roadway Items		Est. Quant.	Unit	Unit Price	Total
Class A Conc (attach to ex. piers / abutt)		4	EA	\$5,000.00	\$20,000
pre-fabricated ped steel truss bridge		150	LF	\$1,500.00	\$225,000
water handling		1	LS	\$20,000.00	\$20,000
Crane		1	LS	\$8,000.00	\$8,000
Contract Items		SUBTOTAL			\$0
Clearing and Grubbing Roadway				2.0%	\$0
M & P of Traffic				4.0%	\$0
Mobilization				7.5%	\$0
Construction Staking				1.0%	\$0
Minor Items (Applied to Roadway Items only)				0.0%	\$0
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$0
INCIDENTALS				21.0%	\$0
CONTINGENCIES				10%	\$0
		TOTAL ESTIMATED COST			\$0
Estimated By: VC Checked By:					
Date of Estimate: 05/18/2010					

Notes:

1) Cost for bridge may vary widely based on selected materials, structure width, span between supports, etc.

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: Type: Planned Trail Segment From Sta: To Sta: A length of 4,960 Feet as shown on the plans		
Segment No.	Segment Description			
#7	10' width - new structure supported on east River bank - from pedestrian bridge to Maple Street bridge (\$5000 cost for signage only, budget for segment previously determined by Borough of Naugatuck) (SECONDARY)	Price Base Yr 2010		
Roadway Items		Est. Quant.	Unit	Unit Price
Cost for Path Signage (include this cost only)		1	LS	\$5,000.00
earth excavation		800	LF	\$14.00
processed aggregate		800	LF	\$17.00
superpave		800	LF	\$20.00
Class A Conc Slab		4,160	LF	\$225.00
Class A Conc (new piers / abutt)		60	EA	\$1,000.00
Metal Beam Rail		4,960	LF	\$35.00
Driving Steel Piles		4,160	LF	\$25.00
Crane		1	LS	\$8,000.00
water handling		1	LS	\$20,000.00
Contract Items				SUBTOTAL
Clearing and Grubbing Roadway		5.0%		\$67,100
M & P of Traffic		4.0%		\$53,700
Mobilization		7.5%		\$100,700
Construction Staking		1.0%		
Minor Items (Applied to Roadway Items only)		25.0%		\$332,800
Contingencies & Incidentals		CONSTRUCTION TOTAL		\$1,900,000
INCIDENTALS		21.0%		\$399,000
CONTINGENCIES		10%		\$190,000
		TOTAL ESTIMATED COST		\$5,000
Estimated By: VC				
Checked By:				
Date of Estimate: 05/18/2010				

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: 12" Type: Shared-Use in ROW From Sta: To Sta: A length of 2,190 Feet as shown on the plans			
Segment No.	Segment Description	Price Base Yr: 2010			
#8	10' width - from Maple St. bridge to segment North of Breen Field rec park - includes segment near transit center				
Roadway Items		Est. Quant.	Unit	Unit Price	Total
earth excavation		2,190	LF	\$14.00	\$30,660
processed aggregate		2,190	LF	\$17.00	\$37,230
Steel-Backed Timber Guide Rail		2,190	LF	\$125.00	\$273,750
superpave		2,190	LF	\$20.00	\$43,800
Contract Items		SUBTOTAL			\$385,400
Clearing and Grubbing Roadway			2.0%		\$7,700
M & P of Traffic			4.0%		\$15,400
Mobilization			7.5%		\$28,900
Construction Staking			1.0%		\$3,900
Minor Items (Applied to Roadway Items only)			25.0%		\$88,700
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$530,000
INCIDENTALS			21.0%		\$111,300
CONTINGENCIES			10%		\$53,000
		TOTAL ESTIMATED COST			\$694,300
Estimated By: VC					
Checked By:					
Date of Estimate: 05/18/2010					

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: 12" Type: Shared-Use Off-Street From Sta: To Sta: A length of 320 Feet as shown on the plans			
Segment No.	Segment Description				
#9	10' width - crossing just North of Breen Field rec.park	Price Base Yr 2010			
Roadway Items		Est. Quant.	Unit	Unit Price	Total
	earth excavation	320	LF	\$14.00	\$4,480
	processed aggregate	320	LF	\$17.00	\$5,440
	superpave	320	LF	\$20.00	\$6,400
Contract Items					SUBTOTAL
	Clearing and Grubbing Roadway		5.0%		\$800
	M & P of Traffic		4.0%		\$700
	Mobilization		7.5%		\$1,200
	Construction Staking		1.0%		\$200
	Minor Items (Applied to Roadway Items only)		25.0%		\$3,000
Contingencies & Incidentals					CONSTRUCTION TOTAL
	INCIDENTALS		21.0%		\$4,200
	CONTINGENCIES		10%		\$2,000
		TOTAL ESTIMATED COST			\$26,200
Estimated By: VC Checked By: Date of Estimate: 05/18/2010					

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: 12" Type: Shared-Use in ROW From Sta: To Sta: A length of 1,500 Feet as shown on the plans			
Segment No.	Segment Description	Price Base Yr: 2010			
#10	10' width - from segment North of Breen Field rec.park to new bridge south of Breen Field				
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
Steel-Backed Timber Guide Rail		1,500	LF	\$125.00	\$187,500
superpave		1,500	LF	\$20.00	\$30,000
Contract Items		SUBTOTAL			\$264,000
Clearing and Grubbing Roadway		2.0%			\$5,300
M & P of Traffic		4.0%			\$10,600
Mobilization		7.5%			\$19,800
Construction Staking		1.0%			\$2,600
Minor Items (Applied to Roadway Items only)		25.0%			\$60,800
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$360,000
INCIDENTALS		21.0%			\$75,600
CONTINGENCIES		10%			\$36,000
		TOTAL ESTIMATED COST			\$471,600
Estimated By: VC Checked By: Date of Estimate: 05/18/2010					

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: Type: New Bridge From Sta: To Sta: A length of 180 Feet as shown on the plans			
Segment No.	Segment Description	Price Base Yr 2010			
#11	10' wide - pedestrian bridge South end of Breen Field				
Roadway Items		Est. Quant.	Unit	Unit Price	Total
	Class A Conc (new piers / abutt)	5	EA	\$25,000.00	\$125,000
	pre-fabricated ped steel truss bridge	180	LF	\$1,500.00	\$270,000
	water handling	1	LS	\$20,000.00	\$20,000
	Crane	1	LS	\$8,000.00	\$8,000
Contract Items		SUBTOTAL			\$423,000
	Clearing and Grubbing Roadway		2.0%		\$8,500
	M & P of Traffic		0.0%		\$0
	Mobilization		7.5%		\$31,700
	Construction Staking		1.0%		\$4,200
	Minor Items (Applied to Roadway Items only)		0.0%		\$0
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$470,000
	INCIDENTALS		21.0%		\$98,700
	CONTINGENCIES		10%		\$47,000
		TOTAL ESTIMATED COST			\$615,700
Estimated By: VC Checked By:					
Date of Estimate: 05/18/2010					

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 truss bridge, with synthetic lumber decking and a single clear span of 180 feet.

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: 12" Type: Shared-Use Off-Street From Sta: To Sta: A length of 5,220 Feet as shown on the plans			
Segment No.	Segment Description				
#12	10' width - from bridge South of Breen Field to Naug./Beacon Falls townline	Price Base Yr 2010			
Roadway Items		Est. Quant.	Unit	Unit Price	Total
	earth excavation	5,220	LF	\$14.00	\$73,080
	processed aggregate	5,220	LF	\$17.00	\$88,740
	superpave	5,220	LF	\$20.00	\$104,400
Contract Items		SUBTOTAL			\$266,200
	Clearing and Grubbing Roadway		5.0%		\$13,300
	M & P of Traffic		4.0%		\$10,600
	Mobilization		7.5%		\$20,000
	Construction Staking		1.0%		\$2,700
	Minor Items (Applied to Roadway Items only)		25.0%		\$48,300
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$360,000
	INCIDENTALS		21.0%		\$75,600
	CONTINGENCIES		10%		\$36,000
		TOTAL ESTIMATED COST			\$471,600
Estimated By: VC					
Checked By:					
Date of Estimate: 05/18/2010					

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: Type: New Bridge From Sta: To Sta: A length of 90 Feet as shown on the plans			
Segment No.	Segment Description	Price Base Yr 2010			
#13	10' width - new bridge over River at RR pinch point - near sewage plant				
Roadway Items		Est. Quant.	Unit	Unit Price	Total
Class A Conc (new piers / abutt)		4	EA	\$25,000.00	\$100,000
pre-fabricated ped steel truss bridge		90	LF	\$1,500.00	\$135,000
water handling		1	LS	\$20,000.00	\$20,000
Crane		1	LS	\$8,000.00	\$8,000
Contract Items		SUBTOTAL			\$263,000
Clearing and Grubbing Roadway			2.0%		\$5,300
M & P of Traffic			0.0%		\$0
Mobilization			7.5%		\$19,700
Construction Staking			1.0%		\$2,600
Minor Items (Applied to Roadway Items only)			0.0%		\$0
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: 05/18/2010					

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 truss bridge, with synthetic lumber decking and a single clear span of 90 feet.

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: 12" Type: Shared-Use in ROW From Sta: To Sta: A length of 900 Feet as shown on the plans			
Segment No.	Segment Description	Price Base Yr 2010			
#14(a)	10' width - on street spur connection to the Naugatuck train station and Historical Society Museum (SECONDARY)				
Roadway Items		Est. Quant.	Unit	Unit Price	Total
earth excavation		900	LF	\$14.00	\$12,600
processed aggregate		900	LF	\$17.00	\$15,300
brick and landscape buffer		900	LF	\$150.00	\$135,000
superpave		900	LF	\$20.00	\$18,000
Contract Items		SUBTOTAL			\$180,900
Clearing and Grubbing Roadway		2.0%			\$3,600
M & P of Traffic		4.0%			\$7,200
Mobilization		7.5%			\$13,600
Construction Staking		1.0%			\$1,800
Minor Items (Applied to Roadway Items only)		25.0%			\$42,100
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$250,000
INCIDENTALS		21.0%			\$52,500
CONTINGENCIES		10%			\$25,000
		TOTAL ESTIMATED COST			\$327,500
Estimated By: VC					
Checked By:					
Date of Estimate: 05/18/2010					

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: 12" Type: Shared-Use in ROW From Sta: To Sta: A length of 19,500 Feet as shown on the plans			
Segment No.	Segment Description	Price Base Yr: 2010			
#14(b)	10' width - spur to the west near Maple St. Bridge (signed roadway trail to Naugatuck State Forest) (cost range of \$5,000-\$50,000 for signage) (SECONDARY)				
Roadway Items		Est. Quant.	Unit	Unit Price	Total
Cost for Path Signage (include this cost only)		1	LS	\$5,000.00	\$5,000
earth excavation		19,500	LF	\$14.00	\$273,000
processed aggregate		19,500	LF	\$17.00	\$331,500
superpave		19,500	LF	\$20.00	\$390,000
Contract Items		SUBTOTAL			\$994,500
Clearing and Grubbing Roadway			2.0%		\$19,900
M & P of Traffic			4.0%		\$39,800
Mobilization			7.5%		\$74,600
Construction Staking			1.0%		\$9,900
Minor Items (Applied to Roadway Items only)			25.0%		\$180,400
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$1,320,000
INCIDENTALS			21.0%		\$277,200
CONTINGENCIES			10%		\$132,000
		TOTAL ESTIMATED COST			\$5,000
Estimated By: VC					
Checked By:					
Date of Estimate: 05/18/2010					

Note:

1) The cost for new signage for this segment may vary between \$5,000 and \$50,000.

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: 10' Depth: 12" Type: Shared-Use in ROW From Sta: To Sta: A length of 1,820 Feet as shown on the plans			
Segment No.	Segment Description	Price Base Yr: 2010			
#15	10' width - spur East between parking lots - ends at Cross St. School				
Roadway Items		Est. Quant.	Unit	Unit Price	Total
earth excavation		1,820	LF	\$14.00	\$25,480
processed aggregate		1,820	LF	\$17.00	\$30,940
Steel-Backed Timber Guide Rail		1,820	LF	\$125.00	\$227,500
superpave		1,820	LF	\$20.00	\$36,400
Contract Items		SUBTOTAL			\$320,300
Clearing and Grubbing Roadway		2.0%			\$6,400
M & P of Traffic		4.0%			\$12,800
Mobilization		7.5%			\$24,000
Construction Staking		1.0%			\$3,200
Minor Items (Applied to Roadway Items only)		25.0%			\$73,700
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$440,000
INCIDENTALS		21.0%			\$92,400
CONTINGENCIES		10%			\$44,000
		TOTAL ESTIMATED COST			\$576,400
Estimated By: VC Checked By: Date of Estimate: 05/18/2010					

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: Depth: Type: Ped / Bike Trailhead From Sta: To Sta: A length of			
T		Price Base Yr	2010		
	Roadway Items	Est. Quant.	Unit	Unit Price	Total
	7 stall parking lot	1	EA	\$20,000.00	\$20,000
	Ped / Bike Trailhead	3	EA	\$8,000.00	\$24,000
	Contract Items			SUBTOTAL	\$24,000
	Clearing and Grubbing Roadway		5.0%		\$1,200
	M & P of Traffic		4.0%		\$1,000
	Mobilization		7.5%		\$1,800
	Construction Staking		1.0%		\$200
	Minor Items (Applied to Roadway Items only)		25.0%		\$6,000
	Contingencies & Incidentals			CONSTRUCTION TOTAL	\$30,000
	INCIDENTALS		21.0%		\$6,300
	CONTINGENCIES		10%		\$3,000
				TOTAL ESTIMATED COST	\$39,300
	Estimated By: VC				
	Checked By:				
	Date of Estimate: 05/18/2010				

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: Depth: Type: Small Boat Launch From Sta: To Sta: A length of			
B		Price Base Yr 2010			
	Roadway Items	Est. Quant.	Unit	Unit Price	Total
	Small Boat Launch	2	EA	\$5,000.00	\$10,000
	Contract Items			SUBTOTAL	\$10,000
	Clearing and Grubbing Roadway		5.0%		\$500
	M & P of Traffic		4.0%		\$400
	Mobilization		7.5%		\$800
	Construction Staking		1.0%		\$100
	Minor Items (Applied to Roadway Items only)		25.0%		\$2,500
	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: 05/18/2010				

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: Depth: Type: Rest Area From Sta: To Sta: A length of			
R		Price Base Yr 2010			
	Roadway Items	Est. Quant.	Unit	Unit Price	Total
	Rest Area	1	EA	\$5,000.00	\$5,000
	Contract Items			SUBTOTAL	\$5,000
	Clearing and Grubbing Roadway		5.0%		\$300
	M & P of Traffic		4.0%		\$200
	Mobilization		7.5%		\$400
	Construction Staking		1.0%		\$100
	Minor Items (Applied to Roadway Items only)		25.0%		\$1,300
	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: 05/18/2010				

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: Depth: Type: Transit Center From Sta: To Sta: A length of			
TC		Price Base Yr	2010		
	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		4.0%		\$3,000
	Mobilization		7.5%		\$5,600
	Construction Staking		1.0%		\$800
	Minor Items (Applied to Roadway Items only)		25.0%		\$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: 05/18/2010				

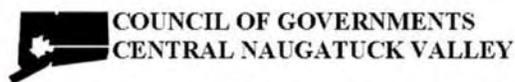
STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: Depth: Type: Park / Open Space (Large) From Sta: To Sta: A length of			
Park(L)		Price Base Yr	2010		
	Roadway Items	Est. Quant.	Unit	Unit Price	Total
	Cotton Hollow Field	1	EA	\$120,000.00	\$120,000
	Contract Items			SUBTOTAL	\$120,000
	Clearing and Grubbing Roadway		5.0%		\$6,000
	M & P of Traffic		4.0%		\$4,800
	Mobilization		7.5%		\$9,000
	Construction Staking		1.0%		\$1,200
	Minor Items (Applied to Roadway Items only)		25.0%		\$30,000
	Contingencies & Incidentals		CONSTRUCTION TOTAL		\$170,000
	INCIDENTALS		21.0%		\$35,700
	CONTINGENCIES		10%		\$17,000
			TOTAL ESTIMATED COST		\$222,700
Estimated By: VC					
Checked By:					
Date of Estimate: 05/18/2010					

Regional Naugatuck River Greenway Routing Study

STATE OF CONNECTICUT DEPARTMENT OF TRANSPORTATION BUREAU OF ENGINEERING & HIGHWAY OPERATIONS FUSS & O'NEILL PRELIMINARY COST ESTIMATE		City of: Naugatuck Funding: Project #: 2009303.A10 Width: Depth: Type: Park / Open Space (Small) From Sta: To Sta: A length of			
Park(S)	Price Base Yr	2010			
Roadway Items		Est. Quant.	Unit	Unit Price	Total
Corner of Maple and South Main Street		1	EA	\$75,000.00	\$75,000
Contract Items		SUBTOTAL			\$75,000
Clearing and Grubbing Roadway			5.0%		\$3,800
M & P of Traffic			4.0%		\$3,000
Mobilization			7.5%		\$5,600
Construction Staking			1.0%		\$800
Minor Items (Applied to Roadway Items only)			25.0%		\$18,800
Contingencies & Incidentals		CONSTRUCTION TOTAL			\$110,000
INCIDENTALS			21.0%		\$23,100
CONTINGENCIES			10%		\$11,000
		TOTAL ESTIMATED COST			\$144,100
Estimated By: VC					
Checked By:					
Date of Estimate: 05/18/2010					



Streetscape improvements along Maple Street will help to link the river with the Naugatuck Green.



*For more information, contact: Council of Governments of the Central Naugatuck Valley
60 North Main Street, 3rd Floor, Waterbury, Connecticut 06702-1403 • 203-757-0535 • www.cogcnv.org*

