



Belmont, Massachusetts Community Path Feasibility Study

B E T A

ENGINEERING SUCCESS TOGETHER

Belmont Community Path Feasibility Study

Belmont, Massachusetts Office of Community Development
Response to RFP



Submitted to:

Mr. Jeffrey A. Wheeler, Senior Planner
Office of Community Development
Homer Municipal Building
19 Moore Street
Belmont, MA 02478

Submitted by:

BETA Group, Inc.
315 Norwood Park South, 2nd Floor
Norwood, MA 02062

April 22, 2016



www.beta-inc.com



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Mr. Jeffrey A Wheeler, Senior Planner
Office of Community Development
Homer Municipal Building
19 Moore Street
Belmont, MA 02478

**Re: Request for Proposals
Belmont Community Path Feasibility Study**

Dear Mr. Wheeler,

BETA Group Inc. (BETA) is excited to present this proposal for a Feasibility Study for a Community Path in Belmont, Massachusetts. Our team understands the importance of this project and is eager to work with the Town and community in reaching your goal of creating enhanced recreational opportunities, benefitting the Town and its residents for years to come.

BETA is a multidisciplinary firm specializing in Civil Engineering, Landscape Architecture, Environmental Engineering, and a wide range of professional engineering services. We have worked on similar projects in communities throughout New England and have assembled a specialized team with a wide range of technical expertise that is well-suited to this particular project.

Two of BETA's recent projects are particularly pertinent to Belmont's Community Path initiative.

The Fuller Brook Preservation project involved the construction and restoration of 2 ½ miles of path through a 23 acre park in the center of Wellesley. The design includes five raised boardwalks to reduce environmental impacts.

The Lake Avenue Linear Park project included development of a feasibility study and conceptual design for 1 ½ miles of new multi-use path and linear park along Lake Quinsigamond in Worcester. Many similar grading challenges exist along the lake as may be encountered in the Community path corridor. Based on the recommendations in the study, the first phase of the project has been designed.

We also note that BETA is currently working with the Town on the Master Planning process for Clay Pit Pond. Amanda Sloan has been working closely with the Town on the Master Plan and will provide valuable input to the feasibility study process.

Through our experience on numerous public projects, we understand the importance of community support, experienced project management, and supplying services on budget and in a timely manner. We will work with the Town to ensure that their goals are achieved above and beyond expectations.

Our team will be led by William McGrath, PE, who will serve as Project Manager. Bill has over 30 years of experience in transportation planning and design, including multi-use paths, linear parks, and other pedestrian/recreational facilities. His recent experience includes the Fuller Brook Preservation project in

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Wellesley; the Lake Avenue Linear Park in Worcester; Cochituate Rail Trail in Natick, MA; Fuller Brook Improvements in Wellesley, MA; and the Connecticut Riverwalk in Chicopee, MA. Bill will be supported by an outstanding multi-disciplinary team of experienced professionals dedicated to the successful completion of the feasibility study.

Our team is enhanced by the addition of Toole Design Group (TDG). Toole Design Group is a national leader in the planning and design of multimodal transportation facilities. TDG believes that their job is to help communities plan, build and retrofit their transportation systems so that walking and bicycling are safe, efficient, healthy and enjoyable forms of travel.

We offer our knowledge, proficiency, and creativity to guide this unique opportunity for the Town of Belmont. We are fully committed to staffing the project and completing the study in the time frame included in the RFP.

The BETA team ranks Highly Advantageous according to the Evaluation Criteria included in the RFP.

1. Our team and Project Manager have more than 5 years of demonstrated success on similar multi-model projects.
2. Our proposal is structured to show both our understanding of the Community Path project and its challenges, as well as, a proposed approach to meet these challenges to achieve the Town's goals.
3. Our team and Project Manager have demonstrated experience with more than 5 similar multi-modal planning and design projects.
4. Our team has successfully completed planning studies that have ultimately led to funding for advancement of the project. Lake Avenue Linear Park in Worcester is one example.

We look forward to discussing the project and our qualifications further with you. If you have any questions, please don't hesitate to call me directly at 781-255-1982.

Sincerely,
BETA GROUP, INC.

A handwritten signature in blue ink that reads "Anthony T. Lionetta". The signature is written in a cursive, flowing style.

Anthony Lionetta, PE
Senior Vice President



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- Certificate of Non-Collusion
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Please note, requested financial statements are provided in a separately sealed envelope.

Section 1 – Project Approach and Scope of Work

General Approach

UNDERSTANDING

The Town of Belmont, through its office of Community Development and Community Path Implementation Advisory Committee, is seeking to construct a Community Multi-use path from the existing Fitchburg Cut-off Path at Brighton Street westerly to the vicinity of the Waverley Commuter Rail Station. The path will be over 2 miles in length depending on the final alignment. It will serve a variety of users, including pedestrians, bicyclists and other non-motorized modes. The path is intended to be fully accessible for disabled persons. The potential alignments offer opportunities for alternate transportation modes to connect schools, public transit, recreational fields, institutional and cultural resources as well as a number of neighborhoods. Implementation of the Belmont Community Path would enhance access to the Alewife 'T' Station, the Minuteman Trail, the Alewife Greenway and the Cambridge Linear Path. It would also connect to the future extension of the Mass Central Trail to the west. The Community Path will close the "Belmont Gap" between Cambridge to the east and Waltham to the west.

Generally, the alignments considered for the Community Path follow the existing alignment of the Fitchburg commuter rail line. Key features along or adjacent to the corridor include Belmont High School, Clay Pit Pond, Grant Memorial Field, Belmont Public Library, Beaver Brook Reservation, the Belmont and Waverley commuter rail stations and Belmont Center.

Potential alignment alternatives have been explored in a preliminary manner. The alignment alternatives can be classified as a north side alignment and a south side alignment. They include a combination of on-road and off-road segments. More in-depth analysis is required to further evaluate various options and identify a preferred alignment that can be advanced into design and construction.

BETA has developed a variety of path designs that have similar elements to the Belmont Community path. Our experience in identifying and overcoming design challenges will provide valuable insight into evaluating the various alignment options for the community path.

BETA is currently working on development of Clay Pit Pond Master Plan adjacent to Belmont High School. This project has offered us the opportunity to enhance our overall knowledge of the community and more particularly, work with Town staff and engage the public.

APPROACH

The ultimate success of a project is often measured by the support provided by the community and overall use of the path once it is opened. Early planning efforts are key to identifying the most appropriate alignments that meet the goals of the community and provide connections to desire points.

Our staff has taken the opportunity to walk the corridor and assess both the opportunities and challenges that may be encountered in advancing the project.

The evaluation process will include a variety of elements that will inform the decision making process.

- Cross Section

- Constructability
- Safety
- Accessibility
- Construction Costs
- Ownership
- Environmental Resources
- Environmental Permitting
- Connections
- Regulated (Contaminated) Materials

Constructability – alignments will be assessed to determine the viability of being able to actually implement the construction of the segment. Engineering studies will be undertaken to evaluate the horizontal and vertical requirements of each option, safety concerns, and need for structural solutions such as walls, bridges, or underpasses.

Cross Section – The study will establish basic design criteria for the path and develop a recommended cross section. Design criteria will include bicycle design speed, paved width, shoulder width, horizontal and vertical clearances, cross slope, and barrier design.

Safety – potential safety issues will be evaluated for each alignment. The need for implementing specific safety components into the design will be identified. These may include at-grade road crossings, separation of on-road bike lanes, fencing/barriers to protect users from steep slopes or other potential hazards.

Accessibility – the path will need to meet accessibility requirements included in the Americans with Disabilities Act as well as the Massachusetts Architectural Access Board regulations (CMR 521). Longitudinal slopes, cross slopes, path surface, and width are elements that will be assessed to ensure that considered alignments can provide the required accessibility.

Environmental Resources – BETA has included Wetland Strategies on our team to assess potential environmental resources along the corridor that may be impacted by particular alignments. These may include wetland resources, endangered/protected species, priority habitat areas, riverfront areas.

Environmental Permitting – permitting requirements can be a significant effort for any project. They can be both costly and time consuming. Understanding and identifying the process early on can help to streamline the process. Permitting requirements may include:

- NEPA
- MEPA
- Massachusetts Wetlands Protection Act
- Massachusetts Stormwater Management Policy
- Massachusetts Endangered Species Act
- National Pollution Discharge Elimination System (NPDES)

Construction Costs – identifying construction costs is a key factor in determining the feasibility of any of the considered alignments. The costs must account various infrastructure improvements, environmental costs and contingencies.

Ownership – BETA will utilize available GIS or other available record property data to assess whether any of the alignment options will impact private property. This will help to inform right of way requirements needed as the project advances to the 25% design.

Connections – Working with the Town, BETA will identify recreational, institutional, cultural, transit or other key destinations within or adjacent to the corridor. These destinations can provide critical connections to the path and help to determine a preferred option.

Regulated (Contaminated) Materials – BETA will review Department of Environmental (DEP) records to determine if there any known release sites within or adjacent to the corridor. This information will be integrated into the budgetary costs for each alignment segment.

The final product of the Feasibility Study is the identification of a preferred alignment that has the support of the community and the Town. The study will summarize the process, evaluate each of the identified alignment options, discuss opportunities and challenges associated with the options and summarize budgetary costs. The feasibility study will be the first step in informing the Preliminary (25%) design process and the funding process.

The BETA team is fully committed to and capable of completing the Feasibility Study for Belmont’s Community path as outlined in the Request for Proposals and our submittal.

Variances

We note that the Request for Proposals does not include a public outreach component. **Community relations and public outreach** are critical to the successful completion of a project. They are the vehicles whereby stakeholders can express their concerns, ideas, etc. and ultimately reach buy-in and consensus on the appropriate recommended plan and implementation program.

Public outreach and involvement will also enhance applications for future funding requests. MassDOT in particular highly values public support in recommending projects for funding through the State’s Transportation Improvement Program. Documentation of a public outreach program as part of the feasibility study will be critical to gaining support for funding.

We offer some insights into implementing a public outreach program and BETA’s ability and experience to engage the public in adding value to the overall decision making process.

Insights

Based on a review of the Request for Proposals, a field review of the project corridor, and additional research, we offer the following insights:

ALIGNMENTS

A number of potential path alignments have been identified through various efforts by the Town and the Community Path Implementation Advisory Committee. BETA staff has reviewed these alignments in the field to gain insight into the potential of each option. The following provides some initial thoughts regarding these alignment options.

East Belmont Segment

The first segment of the path will extend from Brighton Street at the terminus of the Fitchburg Cut-off Path to the underpass at Concord Avenue. The connection to the Fitchburg Cut-off Path occurs at an existing crosswalk on Brighton Street adjacent to the at-grade rail crossing.

North alignment - Options for this segment include an alignment paralleling the commuter rail to the north of the tracks. This provides good continuity with the Fitchburg Cut-off path which is also north of the tracks. Challenges for this alignment include access through the industrial area west of Brighton Road as well as maintaining privacy for the residential properties that abut the railroad. The path on this alignment would be adjacent to the backyards of these properties.

Other challenges along this alignment include the interface with the construction laydown area at the end of Alexander Avenue and a connection at Concord Avenue at the railroad underpass. It appears that there is sufficient width on the bridge to allow the path to run adjacent to the tracks and north of the station platform. The embankment between the Concord Avenue sidewalk and the station can be utilized to install an accessible ramp connecting the path and Concord Street. This would preserve the existing stairs while providing accessible access to the station. Utilizing the existing bridge as part of the community path connection will require close coordination with and approval of the MBTA.

Alexander Avenue extension could be considered to provide an alternate (interim) solution to connecting with Concord Avenue. This option would require the development of on-road bike lanes along a portion of Channing Road to provide a continuous path. The existing width of Channing Road likely cannot accommodate bike lanes without impacting existing on-street parking. This option would utilize the new traffic signal and pedestrian crossings at Concord Avenue and Leonard Street being installed as part of the Belmont Center improvements to access the station area.

BETA has worked with communities and individual owners to develop screening options. Ideally, existing vegetation is maintained to provide a natural, mature buffer. This buffer can be enhanced through additional vegetation, fencing or developing an earth berm. BETA's approach is to engage the neighbors through public workshops to allow them to fully understand the project and provide input into the process.

South Alignment – An alternate alignment would be on the south side of the tracks behind the high school. This alignment would connect to the on-road bike lanes on Concord Avenue running between the Virgilio Arena and the soccer field. Key challenges for this alignment include the connection to the Fitchburg Cut-off Path, interface with the maintenance driveway for the arena and crossing Concord Avenue to access the eastbound bike lanes.

Consideration should be given to having the path alignment run parallel to the parking area/turnout and connect to Concord Street near the gas station. A new enhanced mid-block crossing would be required to connect with the eastbound bike lane. This would also provide a direct connection to the Library.

At all roadway crossings, the design will need to discourage the use of the trail by unauthorized motor and recreational vehicles while allowing access for emergency and maintenance vehicles. The generally approved approach includes the use of narrow islands bounded by mountable curb with a low reveal and the island planted with low growing vegetation or constructed with a colored, hardscape material.



Alexander Avenue Connector – In conjunction with a southerly alignment between Brighton Road and Concord Avenue is a potential option to connect across the railroad. This option could also work in concert with the northerly alignment as it provides alternate north-south connection across the tracks.

To accomplish this connection an underpass would need to be constructed. The construction would take place while the railroad remained active. This would be accomplished by “jacking” the new underpass structure under the rail bed. This can be a fairly expensive operation and must consider railway operations, soil conditions, groundwater elevation, existing utilities, storm drainage and the location/size of jacking pits.

Given the elevation of the rail bed in this area it’s likely that the path would need to be depressed several feet below the existing ground in order to provide adequate clearance between the roof of the underpass and the rail bed. Retaining walls would be needed along the path on both sides of the tracks to transition to the existing ground elevation at an accessible slope.

Central Segment

This segment of the path extends westerly from the Concord Avenue/Belmont Station area. There are several alignments that may be considered for this segment.

Royal Road North Side – This alignment would continue adjacent to the tracks on the north side passing behind the station platform and the Police Station. The path would likely occupy the wooded area along the base of the rail bed. A key consideration in this segment will be maintaining separation between the rails and the path. Retaining walls would be required to support the embankment and path as it approaches the Clark Street Bridge and transitions out of the rail corridor and up to Pleasant Street. Consideration should be given to employing Mechanically Stabilized Earth (MSE) walls to minimize the excavation required.

Royal Road South Side – This alignment would connect from the north side of the tracks utilizing the existing tunnel at the Belmont Station. Connection to the tunnel could be made by modifying the



existing path adjacent to the retaining wall to meet ADA requirements. The path would continue through the wooded area south of the tracks transitioning up to meet Clark Street adjacent to its intersection with Royal Road and the Clark Street Bridge. This segment appears to include some wetland areas and would likely require the removal of a number of mature trees. To the extent possible the path could meander through this segment to preserve trees. As discussed in the following section a structural solution such as a boardwalk may be appropriate for portions of the alignment that impact the wetland areas.

An alternate alignment may include extending the path under the Clark Street Bridge and continuing adjacent to the tracks. Replacement and lengthening of the bridge would allow for the necessary horizontal clearance between the path and the tracks. Significant retaining walls would be needed to support the existing embankment south of the tracks.

Pleasant Street North Side – This segment would cross Pleasant Street at the Clark Street Bridge and extend westerly through an existing wooded area south of Snake Hill Road. There are existing 3 foot to 4 foot shoulders on both sides of Pleasant Street and a sidewalk on the south side. Crossing Pleasant Street near Clark Street is not an ideal location for a safe crossing. Pleasant Street has fairly high traffic volumes and speeds. A horizontal curve to the east and a vertical curve to the west both impact available sight distance both for path users crossing the road and for drivers approaching the crossing. Additionally, a path alignment north of Pleasant Street creates significant grading challenges including a steep approach at Snake Hill Road adjacent to a less than ideal at-grade crossing location. It appears that extensive retaining walls would be needed to maintain ADA compliant path grades.

Engineering design using devices like Rectangular Rapid Flashing Beacons (RRFB), signing, pavement markings and more visible paving materials can enhance the visibility of the crossing to increase safety. Completion of this segment will promote potential connections to Beaver brook Reservation.



Pleasant Street South Side – This alignment utilizes Clark Lane and Pearson Road south of the tracks before transitions back to the rail corridor through an existing parking area. Clark Lane and Pearson Road are both low volume streets where it may be appropriate to allow

shared use between bicycles and vehicles. Pedestrians could utilize the existing sidewalk on Pearson Road although no sidewalk exists on Clark Lane. A new connection will need to be constructed to connect Clark Lane to Pearson Road. This connection would potentially impact two (2) parking spaces on Pearson Road. Similar to portions of the Royal Road alignments, extensive retaining walls would be required for the path to run adjacent to the tracks and maintain the necessary horizontal separation.

West Belmont

Waverley Square North Side – This segment continues the Pleasant Street North alignment through the Western Greenway and the Woodlands at Belmont Hill connecting to Mill Street at an existing crosswalk north of the Trapelo Road intersection. The alignment continues across Mill Street and enters the Beaver Brook Reservation north of Trapelo Road. The path accesses the southern section of Beaver Brook through an at-grade crossing at the intersection of Trapelo Road and Waverley Oaks Road. The path then follows existing paths through the park. This alignment takes advantage of existing recreational resources to enhance the path experience. A new bridge crossing Beaver Brook north of Trapelo Road would be needed to maintain the alignment through the park. While existing walking paths are available that provide crossings, it is likely not cost effective or beneficial to the overall park trail system to upgrade these paths. An alternative to consider would be to cross Trapelo Road at the traffic signal at Mill Street and enter the park from Trapelo Road. Geometric improvements to the northeast corner of the intersection would improve sight distance and safety to path users and pedestrians in general.



Development of this alignment will require close coordination with DCR. BETA has worked successfully with DCR on a number of projects including the Cochituate Rail Trail which interfaces with the DCR managed Cochituate State Park.



Waverley Square South Side – This alignment extends the Pleasant Street South alignment along the rail corridor south of the tracks. It connects to Waverley Station. As with the Pleasant Street alignment, this will require extensive retaining walls to allow for horizontal separation between the tracks and the path. The alignment suggests utilizing the station to cross from the south side of the racks to the north side. There is an existing at-grade pedestrian crossing of the tracks within the station. However, it is unlikely that the MBTA would support increasing the number of users at this crossing due to safety concerns. Also,

this alignment requires that the path users utilize the platforms to continue along the alignment. Again, this is likely problematic for the MBTA.

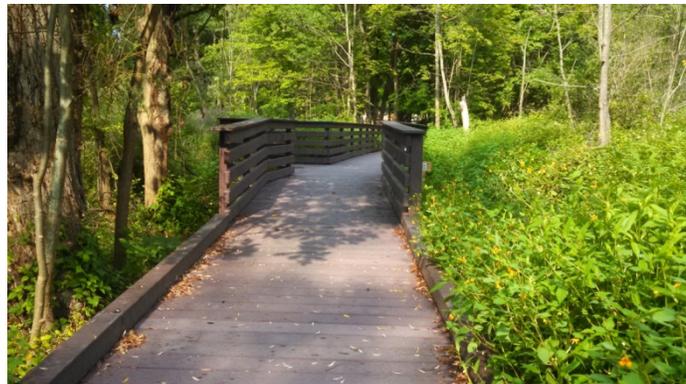
An alternate alignment suggests transitioning from the rail corridor to the street network at A Street. The path would then follow Grant Avenue and White Street to Trapelo Road. Sidewalks exist on Grant Avenue and White Street. These would need reconstruction to current ADA standards. Bicycle accommodations could be provided as a shared use. Sufficient width is available on Trapelo Road to provide bike lanes in both directions. There are also sidewalks on both sides to provide pedestrian accommodations. Modifications to the lane configuration and signal layout at the Trapelo Road/Lexington Street/Moraine Street intersection could be made to accommodate the path allowing it to continue along Moraine Street and accessing Beaver Brook Reservation at its southerly end.

STRUCTURES

The feasibility study will initially assess the structures required for the identified alignments. Such structures are likely to include retaining walls, underpasses, bridges and elevated boardwalks. This assessment should not only include a conceptual level review of the anticipated capital construction costs but should also assess constructability; impacts to railroad operations; environmental resources; right-of-way; safety and security, and aesthetics.

Retaining Walls - Construction of a multi-use pathway whose alignment moves from on-road to off road segments and segments along the existing railroad corridor, will result in the need for grade transitions. Such transitions will be required meet MAAB /ADA requirements and therefore required the construction of retaining walls. For instance, the Royal Road north and south alignments requires the multi-use path to transition from along the railroad corridor up to Clark Street. This change in grade will require retaining walls to support the multi-use path in order to minimize impacts to the railroad corridor and railroad operations.

Elevated Walkways - In several locations the multi-use path traverses areas that appear to be wetlands or low lying areas subject to standing water. The Royal Road south side alignment possesses one such off-road segment just west of the Belmont commuter rail station. This segment of path will require elevated boardwalks similar to the ones designed by BETA for the Fuller Brook Path in Wellesley, MA. These types of structures



Bridges - There are several opportunities to incorporate bridges along the path. These include at the existing pedestrian bridge at Clark Street over the railroad and within DCR's Beaver Brook Reservation in order to cross Beaver Brook. Replacing the bridge at Clark Street is an opportunity to provide a wider, taller and more context sensitive structure to improve and enhance the experience of path users. This location provides a great vantage point from which to watch the commuter rail trains passing below. The bridge crossing over Beaver Brook is another great opportunity to provide a structure that again fits within the context of its setting while enhancing the user's experience.

Tunnels - The proposed Alexander Avenue Connector alignment requires a tunnel beneath the MBTA tracks to connect the path from Alexandra Avenue / Channing Road to the Belmont High School athletic fields. From our initial site walk it appears such a tunnel would need to be depressed below the elevation of the athletic fields in order to achieve sufficient vertical clearance within the tunnel while providing a sufficient track support structure beneath the double tracked railroad. A depressed tunnel results in additional issues that must be assessed such as: meeting MAAB/ADA requirements; storm and groundwater control; as well as lighting, safety and security. On the other hand, the existing pedestrian tunnel adjacent to the Belmont train station appears well suited for bringing the path under the tracks. It is anticipated that only minor modifications would be required such as improving the tunnel floor to meet MAAB/ADA requirements.



VISIONING & PUBLIC OUTREACH



Community relations and public outreach are critical to the successful completion of a project. They are the vehicles whereby stakeholders can express their concerns, ideas, etc. and ultimately reach buy-in and consensus on the appropriate recommended plan and implementation program. BETA is excited about joining with the town of Belmont, the town government, departments, committees,

bicycle advocacy and neighborhood groups, and all who have a stake in the Belmont Community Path, to embark on the process of furthering the project's design. Our staff members listen carefully to community needs and values and reflect these in our concepts. We aim to use a considered and inclusive approach with the goal of bringing a consensus that moves the project forward.

Graphic presentation of initial ideas in an easily understandable graphic format, for discussion and further development is essential to public outreach. Our canvas is in the form of hand sketches, inspirational images (from existing projects) and computer generated drawings. We will often use

Photoshop to show an existing condition next to proposed options. Our graphics will clearly convey ideas and options in the Feasibility Study Report as well.

Visioning strategies will be utilized as our team applies their professional expertise on assessing the current trail options while remaining open to additional routes that may exist. We will also look for opportunities for trail enhancements such as the potential for linear or pocket parks, overlooks, resting places, community art, interpretation, ADA compliance, historic restoration and links to the community. Often the incorporation of these enhancements brings new opportunities for funding. BETA will provide creative and constructive solutions concerning the interface with the MBTA. This might take the form of tile art in an underpass or interpretive signs on an overpass fence.



Public Outreach, Graphic Presentation and Visioning will be spearheaded by BETA Landscape Architects Kelly Carr and Amanda Sloan, both of whom have a wealth of experience in design, graphic presentation and obtaining public consensus for trail projects. Work will be accomplished in coordination with Project Manager Bill McGrath, the Feasibility Study Team and the Town of Belmont.

Scope of Work

The following provides our Scope of Work to complete the feasibility Study in accordance with the Request for proposals.

TASK 1 – REVIEW and PROPOSAL of CONCEPTS

1.1 Review Existing Documentation

Team Members – William McGrath, Andrew Ogilvie, Mark Gershman, Kelly Carr, Toole Design

The BETA team will complete the review and analysis of existing resource materials provided in the Belmont Community Path Feasibility Study Request for Proposal. The issues matrix (Appendix A), supporting PowerPoint slides, and list of path elements (Appendix B) will provide background for the project and assist with framing future discussions with Town representatives. The BETA team through Toole Design Group (TDG) will also draw upon their national experience and exposure with rails-with-trails projects.

The framework for our approach on this project draws on a recent national survey which identified more than 160 trails located adjacent to active rail lines. These rails-with-trails are developed within and alongside many different types of operating rail service with the most common being freight (Rails-to-Trails Conservancy, *America's Rails-with-Trails*, October 2013). While this report and previous studies like USDOT's *Rails-with-Trails: Lessons Learned* (2002), establish a strong safety record for these types of facilities, it is critical that this project be viewed in its unique context, as the legal and design issues vary depending on the jurisdiction and contractual

arrangements of each situation. Jennifer Toole, President of TDG, did background research and authored the design chapter for the USDOT's *Rails-with-Trails: Lessons Learned* study.

To achieve a better understanding of the context, the team will also conduct a site field investigation to visually assess existing site conditions. This critical visual assessment will provide real-world context to inform future recommendations based on user experiences, constrained areas, aesthetic enhancements, right-of-way or abutter coordination, opinion of probable construction costs, and opportunities for potential funding sources.

1.2 Special Design Considerations – Alignment Options

Team Members – William McGrath, Andrew Ogilvie, Mark Gershman, Kelly Carr, Toole Design

This effort will include a review of the alignment options presented in Appendix B to establish a subset of alignment options that will be evaluated in more depth in Task 2. The process will identify “fatal flaws” that would preclude a particular option from further consideration. The evaluation process will be based on cursory review of the alignments for engineering/constructability issues, environmental impacts, physical constraints and likely MBTA acceptance. This review will draw on the experience of BETA and TDG on past trail studies and designs, discussions with Town and MBTA and review of available information completed in Task 1.1.

Included in this effort will be identification of alternate route alignments that may be considered feasible, but are not included in the original list. These alignments may include a combination of off road and on-road segments.

We will incorporate into this feasibility study an analysis of technical factors relating to setback distance. The term "setback" refers to the distance between the paved edge of a rail-with-trail and the centerline of the closest active railroad track. Although rails-with-trails are currently operating along train corridors of varying types, speeds, and frequencies, no national standards or guidelines dictate rail-with-trail facility design and there is no consensus on an appropriate setback recommendation. To inform design considerations, guidelines and recommendations will be used from a variety of resources including the AASHTO Bicycle Guidelines (using bicycle lane separation as guidance), State Public Utilities Commission standards, FHWA's *Rails-with-Trails Lessons Learned* publication, and surveying current best practice to mention a few. In absence of federal standards some State's and railroads have established their own design standards.

The following factors will be included during this feasibility study:

- Type, speed, and frequency of trains in the corridor
- Separation technique
- Topography
- Sight distance
- Maintenance requirements
- Historical problems
- Corridor ownership

TDG will draw upon the existing presence and precedence in the rails-with-trails community within the Commonwealth of Massachusetts which include:

- Connecticut Riverwalk and Bikeway

- Manhan Rail-Trail
- Norwottuck Rail-Trail (Mass Central Section)
- Shining Sea Bikeway
- Southwest Corridor Park (Pierre Lallement Bike Path)

Because every scenario is different, the setback distance should be determined on a case-by-case basis after engineering analysis and liability assumption discussions. The minimum setback distance ranges from 3 m (10 ft) to 7.6 m (25 ft), depending on the circumstances. In many cases, additional setback distance may be recommended. The lower setback distances may be acceptable to the railroad company or agency, rail-with-trail agency, and design team in such cases as constrained areas, along relatively low speed and frequency lines, and in areas with a history of trespassing where a trail might help alleviate a current problem. The presence of vertical separation or techniques such as fencing or walls also may allow for a narrower setback.

Based on the input and findings revealed in the background materials and site visit, we will review the proposed pathway options, evaluate potential pathway alternative alignments, and highlight design amenity features that are custom tailored to the community's needs. All proposed and potential future pathway alignments will be reviewed and analyzed in accordance with State and Federal standards as well as industry best practices.

The co-location of trails in active railroad corridors can be a complex undertaking as environmental and political conditions often require a variety of design and management strategies. We expect the Belmont Community Path will pose unique challenges that will require a dynamic team with in-depth knowledge of these types of facilities. The TDG team is well positioned to meet those challenges and to assist the Town of Belmont in developing a community asset that meets the needs of both trail and rail users.

1.3 Resource Area Assessment

Team Members – Wetland Strategies, Inc.

Wetlands Strategies, Inc. (WSI) will review the potential alignments to determine the presence of environmental resources that may be impacted the path alignment. Resource areas may include wetlands, wildlife habitat, endangered species, riverfront areas and others. The assessment will include a review of record data, coordination with various regulatory agencies and on-site review.

1.4 Meetings

Team Members – William McGrath, Andrew Ogilvie, Mark Gershman, Kelly Carr, Toole Design

A kick-off meeting will be held with the Town of Belmont. This meeting will establish lines of communication and affirm project expectations. Representatives of Town departments with insight into the project corridor's potential and constraints will be identified and contacted during the early stages of the project.

The BETA team will attend two (2) project coordination meetings to review and present possible pathway route options previously identified by the Board of Selectmen and CPAC, in addition to other alternative routes for consideration. The materials presented during this team meeting will define and identify the project scope for the engineering assessment in Task 2.

1.5 Deliverables:

- List of all pathway segments and amenity features for further study

- Scope of engineering assessments for pathway segments and amenity features

TASK 2 – Engineering Evaluation

This task will include technical analysis to determine the engineering feasibility and constructability of path segment alignments identified in Task 1. The evaluation will provide sufficient information for budgetary costing efforts included in Task 3.

2.1 Design and Constructability

Team Members – William McGrath, Andrew Ogilvie, Mark Gershman

BETA will evaluate each of the alignment options to determine potential issues regarding engineering design and constructability. This effort will include development of evaluation criteria to be used for each segment. The criteria may include:

- Typical Cross Section
- Horizontal alignment –length of segment
- Vertical alignment – significant cuts/fills
- Accessibility
- Structures – Retaining walls, bridges, underpasses
- Right of Way
- Railroad coordination

Existing base information will be developed from available record information including MassGIS, MBTA, MassDOT and the Town. A matrix will be developed for each segment analyzed.

2.2 Environmental Screening

Team Members – William McGrath, Joseph Freeman, Wetland Strategies

Perform Initial Environmental Screening of segments to identify likely regulatory requirements and perform Early Environmental coordination activities. Efforts will include contacting the local Conservation Commission, the State and local historical commissions and consulting DEP files on contaminated sites adjacent to the corridor.

2.3 Safety

Team Members – William McGrath, Andrew Ogilvie, Greg Lucas

Review segments to evaluate potential safety concerns. These may include at-grade road/driveway crossings, underpasses, conflicts with on-road vehicles. Once safety concerns are identified, potential solutions will be considered. These solutions will be integrated into the design evaluation in Task 2.1

2.4 Structures Assessment

Team Members – William McGrath, Mark Gershman

Review alignment segments to determine the need for new structures (retaining walls, boardwalks, bridges, underpasses) to support each segment. Also, evaluate upgrades to existing structures that may be needed. Evaluation will consider design issues, constructability and feasibility. The structural assessments will be integrated into the design evaluation in Task 2.1

2.5 Meetings

Team Members – William McGrath, Andrew Ogilvie, Mark Gershman, Joseph Freeman

The BETA team will attend two (2) project coordination meetings to review the findings of the engineering evaluation and present the Preliminary Engineering Report.

2.6 Deliverable- Preliminary Engineering Report

Preliminary Engineering Report which includes a summary of the findings of the engineering evaluation for each segment reviewed. The report will identify key issues in regard to engineering design, constructability, cost and permitting.

TASK 2A – VISIONING/PUBLIC OUTREACH

The Request for Proposals does not specifically include a public outreach component. As noted in our project insights, BETA believes this is key to gaining public support for the project. Demonstration of a public outreach effort is an important component in pursuing funding for the project.

2A.1 Visioning

Team Members – William McGrath, Andrew Ogilvie, Kelly Carr, Amanda Sloan

Visioning strategies will be utilized to graphically represent key features of the community path. These may include colored plans, 3-D renderings or other graphic tools that clearly convey the potential path opportunities to the public and other stakeholders. As part of the visioning effort, opportunities will be explored for trail enhancements such as the potential for linear or pocket parks, overlooks, resting places, community art, interpretation, ADA compliance, historic restoration and links to the community. Often the incorporation of these enhancements brings new opportunities for funding.

2A.2 Public Meetings

Team Members – William McGrath, Kelly Carr, Amanda Sloan

Community relations and public outreach are critical to the successful completion of a project. They are the vehicles whereby stakeholders can express their concerns, ideas, etc. and ultimately reach buy-in and consensus on the appropriate recommended plan and implementation program. AS part of this process BETA will coordinate and conduct two (2) community workshops to engage the public in the feasibility study process. The first workshop will be held during Task 1 and the second workshop during Task 2.

TASK 3 – COST ESTIMATES

3.1 Budgetary Construction Costs

Team Members – William McGrath, Andrew Ogilvie, Mark Gershman, Benjamin Boynton

Budgetary construction costs will be developed for each segment alignment included in the Preliminary Engineering Report. Budgetary costs will be based on prior experience with similar projects and MassDOT Weighted Average Unit Price information. Budgetary Costs will consider future price escalation and contingencies to account for uncertainties inherent in process. Due to the early stage of the development of costs, a range of likely costs will be provided for each segment. The costs will include a summary of key decisions and assumptions used.

3.2 Funding Opportunities

Team Members – William McGrath, Kelly Carr, Amanda Sloan, Toole Design

The BETA team will explore and summarize potential funding sources that may be applicable to the design and/or construction of the community path. It is expected that funding through the state Transportation Improvement Program (TIP) will be a key component of the funding program. Other sources may include the Rivers, Trails, and Conservation Assistance Program (RTCA) and parkland grants. Given that the anticipated cost of the entire community trail may be significant, potential funding through the TIP will be critical. As part of this task, BETA will communicate with the MassDOT District 6 office regarding the TIP process for the project.

BETA will prepare a Project Notification Form (PNF) for submission to MassDOT District 6 as the first step in applying for TIP funding.

3.3 Meetings

Team Members – William McGrath, Andrew Ogilvie, Kelly Carr, Toole Design

The BETA team will attend two (2) project coordination meetings to present the draft and final Feasibility Study and determine a preferred option for the Community Path. In addition, BETA will attend one (1) Board of Selectmen's meeting to present the Final Feasibility Study.

3.4 Draft Feasibility Study

A Draft Feasibility Study will be prepared outlining the findings of the feasibility study process. The Draft Feasibility Study will include:

- Cross Section Assessment
- Engineering Evaluation
- Constructability
- Safety
- Accessibility
- Construction Costs
- Right of Way
- Environmental Resources
- Environmental Permitting
- Connections
- Regulated (Contaminated) Materials
- Recommended Preferred Alternative

This effort will include preparation of a PowerPoint presentation to present the Draft study to the Town. Ten (10) copies of the Draft Feasibility Study will be provided to the Town at least one (1) week prior to the scheduled meeting to discuss the report.

3.5 Final Feasibility Study

Following review of the Draft Feasibility Study, the Final Feasibility Study will be prepared. The Final Feasibility Study will incorporate to the extent possible comment received on the Draft Study. This effort will include preparation of a PowerPoint presentation to present the Feasibility Study to the Board of Selectmen. Ten (10) copies of the Draft Feasibility Study will be provided to the Town at least one (1) week prior to the scheduled meeting to discuss the report.

Work Plan

Our **Project Manager, William McGrath**, will work/meet with Town staff to obtain a clear understanding of the town's expectations and to identify issues.

Internally, Mr. McGrath as the Project Manager will initiate a meeting with BETA's project team to review project assignments and schedule. Regular internal team meetings will be held to ensure that the project is progressing satisfactorily.

BETA understands the importance of implementing a comprehensive project management approach. Our success and responsiveness to the Town will depend on our ability to anticipate, coordinate, and where possible, control the effects of variables such as design discipline interaction, client decision inputs, cost information, changes in design parameters and numerous other factors. We recognize that the planning, budgeting, scheduling and the progress monitoring function of our project team are important to the success of the project.

Cost Control: Based on a given work plan, approved budgets will be set up for each assignment (or major tasks of a project) and inputted into our financial tracking system. Work-hour charges and cost expenditures are then entered as the work is performed per this budget breakdown structure. This information is available to the Project Manager and key team members on a regular basis to enable them to monitor and analyze their progress from a budgetary position as well as to forecast trends. This system facilitates the performance to budget execution of our projects. There may be occasions when the established budget may need to be adjusted to meet with additional scope requirements or issues that arise over the course of an assignment. In these cases, our approach will be to identify these situations early in the process and minimize "surprises".

Quality Management: BETA has a Quality Assurance/Quality Control (QA/QC) program to assure that projects, whether technical reports or detailed design documents, meet technical operability, constructability and bid-ability requirements. The QA/QC program establishes, upfront, the relevant requirements that must be met for the project. These may include document and design requirements, data collection and permit requirements. An internal peer review process checks for conformity to design standards and criteria so that deficiencies can be identified and rectified before submittals are made. The program also seeks to ensure that work products meet constructability requirements.

Scope Breakdown by Hour

BETA GROUP								TDG		
W McGrath	M Gershman	A Ogilvie	J Freeman	G Lucas	B Boynton	K Carr	A Sloan	M Danila	J Dempsey	J Ciabotti
4		8				8		16	20	32
4		16				8		20	40	40
16	8	24				12		8	12	12
4		8				8		12	12	8
16		88				12		20	36	24
			24							
8		12		40						
8	24	16								
16		16				12		8	8	
8	12	20								
8						24	12			
16						12	16	12		
4	4	16			60			4		8
8	12	12				8		12		
16		16				12				
8	8	20	12			16		12	8	12
8		16	8			12		8	8	
152	68	288	44	40	60	144	28	132	144	136

Schedule

The following presents the anticipated schedule for completion of the Belmont Community Path Feasibility Study including key milestone dates.

Key milestone dates include:

Notice to Proceed – June 1, 2016

Task 1 Complete- August 19, 2016

Task 2 Complete – October 30, 2016

Task 3 Complete – December 31, 2016

<p align="center"><u>Schedule</u> BETA Group Belmont Community Path Feasibility Study</p>							
MILESTONE GOALS	2016						
	JUNE	JULY	AUG	SEPT	OCT	NOV	DEC
NOTICE TO PROCEED	↑						
TASKS 1 -							
Start up / Data Review							
Alignment Options							
Meetings							
Environmental Resource Assessment							
Deliverable							
TASK 2							
Design & Constructability							
Environmental Permitting							
Safety							
Structures Assessment							
Accessibility							
Engineering report							
Meetings							
Public Outreach							
TASK 3 -							
Budgetary Costing							
Funding Options							
Draft Feasibility Study							
Final Feasibility Study							
Meetings							

Work Period  Committee/Board Mtg  Public Mtg/Hearing 

Section 2 – Project Team

Introduction

BETA Group, Inc. (BETA) was established in 1982 and has grown to become a regional leader in the fields of civil/site engineering, traffic/transportation engineering, stormwater management, environmental engineering, structural engineering, landscape architecture, asset management/GIS and environmental science. In 2015, BETA was recognized as a nationally-ranked Top 500 firm by *Engineering News-Record*.



BETA has offices in Lincoln, Rhode Island; Norwood, Massachusetts; Hartford, Connecticut; Chicopee, Massachusetts; and Manchester, New Hampshire and employs a staff of more than 140 engineers, scientists, certified soil evaluators, LEED professionals, landscape architects, planners, construction managers and support personnel.

We take pride in a reputation for high quality technical services, on-time performance and a strong commitment to meeting the needs of our clients.

BETA's composition as a **local employee-owned firm (ESOP)** is a key factor in the successful delivery of projects and services to our clients. Given the structure and nature of the firm, our staff is vested and empowered to perform well. **Our goal is to have and maintain long-term relationships with our clients.**

Organizational Chart

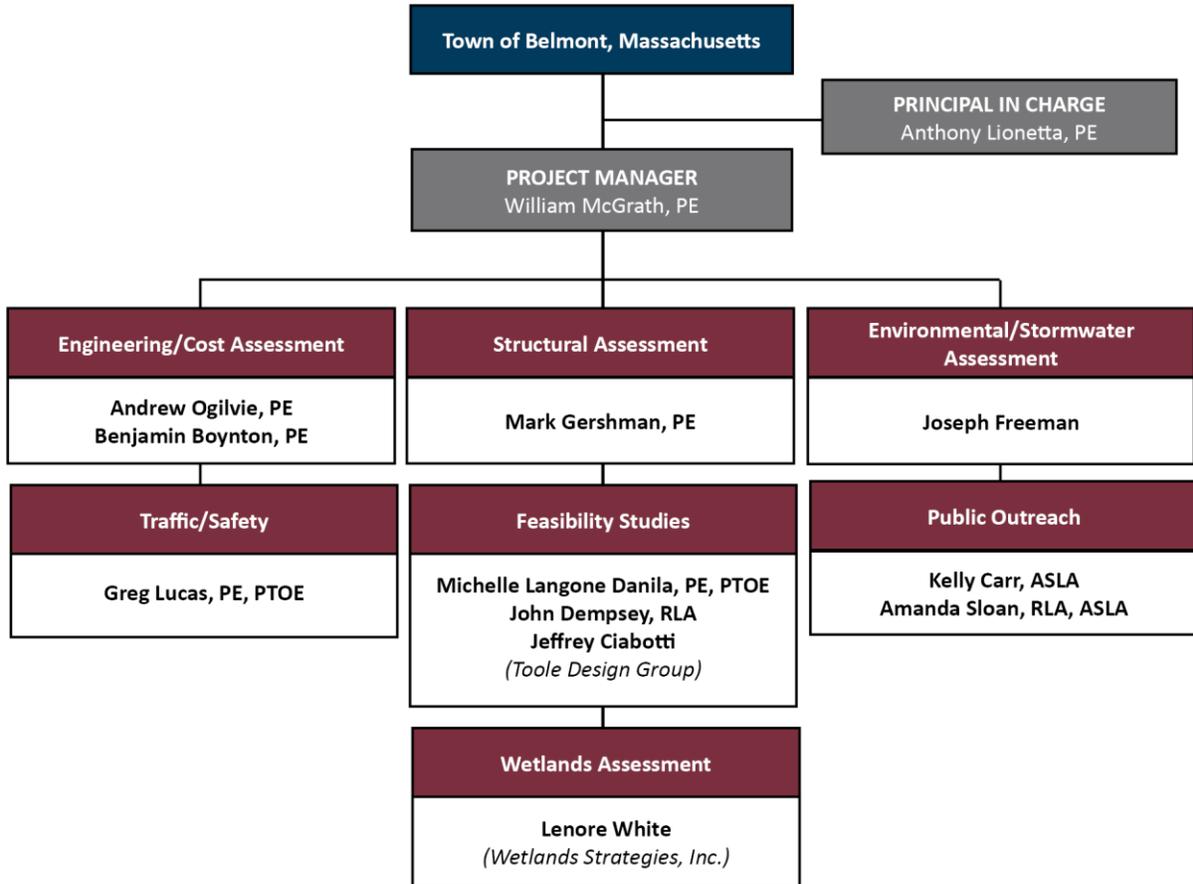
BETA believes that the most successful projects are those that establish a close working relationship with our client so that critical decisions become a collaborative effort. Our clients agree and the result is that the majority of our practice is repeat engagements with existing clients. The concept of providing quality technical services to maintain clients is ingrained in the fabric of BETA. **The result is ENGINEERING SUCCESS TOGETHER.**

BETA has built its reputation by constantly providing a high level of service to its clients. We believe that putting together the right team to work on a project is paramount to that project's success.

BETA staff and our subconsultants have the expertise and proven track records on both high value and high visibility projects. BETA, with a staff of over 140 professionals and support personnel, is highly qualified to provide the specific needs and meet the objectives of this project.

Our goal is to have and maintain long-term relationships with our clients.

The following organizational chart shows that the team we have assembled has the specialized skills required to successfully undertake the tasks required within your Request for Proposals. Summary biographies of key personnel are presented after our organizational chart. Resumes are also appended to this section and include relevant work experience, educational background, continuing education status, professional certifications and publications/presentations.



BETA Group, Inc.

Name	Project Role	Reporting Relationship	Billing Rate
Anthony Lionetta, PE	Principal in Charge	Senior Vice President	N/A
William McGrath, PE	Project Manager	Associate	\$190/Hr
Andrew Ogilvie, PE	Trail Assessments	Project Engineer	\$132/Hr
Mark Gershman, PE	Structural Assessment	Senior Associate	\$190/Hr
Kelly Carr	Public Outreach	Landscape Architect	\$135/Hr
Amanda Sloan	Public Outreach	Landscape Architect	\$120/Hr
Benjamin Boynton, PE	Cost Estimating	Project Engineer	\$105/Hr
Greg Lucas, PE	Traffic & Safety	Project Engineer	\$150/Hr
Joseph Freeman	Environmental/ Stormwater Assessment	Project Engineer	\$174/Hr

Toole Design Group

Name	Project Role	Reporting Relationship	Billing Rate
Michelle Langone Danila, PE, PTOE	Trail Assessments	Senior Engineer	\$148/Hr
John Dempsey, RLA	Trail Assessments	Landscape Architect	\$148/Hr
Jeffrey Ciabotti	Trail Assessments	Senior Planner	\$148/Hr

Wetlands Strategies, Inc.

Name	Project Role	Reporting Relationship	Billing Rate
Lenore White	Wetlands Resource Assessment	Owner and Principal	\$140/Hr

Bios of Key Personnel

William McGrath, PE – Project Manager

Mr. McGrath has over 30 years of experience in civil engineering, primarily in the transportation and traffic engineering fields for state transportation agencies, municipalities and commercial clients. He has worked on a large number of intersection, roadway and traffic improvement projects following the MassDOT project development and design process. His experience also includes planning and design of pedestrian, roadway and bicycle facilities. He is well versed in the evaluation and design of ADA compliant facilities, stormwater management design, utility design and the preparation of construction traffic management plans. He is also experienced in the preparation of right-of-way plans and documents for state and federally funded projects.

Mr. McGrath’s experience in recreational path design includes the Assabet River Rail Trail in Hudson/Marlborough, MA; the Lake Avenue Linear Park in Worcester, MA; and a safety study of the Province Lands bike trail system in Provincetown, MA. **He is currently leading the design of the Connecticut Riverwalk project in Chicopee, MA and the Cochituate Rail Trail in Natick, MA.**

Andrew Ogilvie, PE – Project Engineer

Mr. Ogilvie has 19 years of experience in the civil engineering field, specializing in all forms of transportation projects. He has been responsible for the design of roadway projects for municipal clients as well as state agencies, preparing technical reports and permitting packages. Mr. Ogilvie has provided construction phase services, including the review of contractor submittals and site inspections for many municipalities. **He has been involved with several multi-use trail projects including the Assabet River Trail in Acton and Maynard, MA, the Cochituate Rail Trail in Natick, MA and the Concord River Greenway in Lowell.**

Mark Gershman, PE – Structural Assessment

Mr. Gershman has more than 30 years of experience in the design, management, and oversight of structural projects for municipalities and state agencies. Mr. Gershman has designed, managed, and reviewed several recent pedestrian and bicycle pathway projects including: the Cochituate Rail Trail in Natick, the Connecticut Riverwalk in Chicopee, the Fuller Brook Restoration and Boardwalk Project in

Wellesley; and the Moffett Mill Walkway in Lincoln, RI. **Mr. Gershman is thoroughly aware of MassDOT’s design policies and procedures and will be responsible for ensuring compliance to MassDOT’s and the Town’s design and project delivery requirements.**

Joseph Freeman – Environmental Services & Stormwater Assessment

Mr. Freeman has successfully permitted private and public projects in Massachusetts for 30 years. His experience includes major public infrastructure projects. He has extensive knowledge of all major state and federal environmental regulatory programs including the federal Clean Water Act (US Army Corps of Engineers permits and Section 401 Water Quality Certifications), the Massachusetts Wetlands Protection Act, the Massachusetts Chapter 91 Waterways programs, and US EPA NPDES permits and NPDES Construction Stormwater General Permits. He has obtained approvals from federal and Massachusetts agencies for projects affecting rare species and priority habitats in both upland and marine environments. He has also obtained approvals from Massachusetts and Native American tribal authorities for projects affecting cultural resources.

Gregory Lucas, PE, PTOE – Traffic/Safety

Mr. Lucas has 20 years of experience in the traffic design, highway design and transportation planning fields. His responsibilities have included: design of traffic signal systems including closed loop signal systems, highway design, roundabouts, signage and pavement marking design, guide sign design, traffic management plans, construction staging plans, drainage analyses and design, distribution of quantities, cost estimates, specifications, in addition to providing traffic assessments involving signal design/analyses, signal warrants, and accident analysis. Mr. Lucas is very familiar with MassDOT Highway Division standards and policies and has presented at public hearings for MassDOT TIP projects.

Kelly Carr, ASLA – Public Outreach

Ms. Carr is a Landscape Architect with 30 years of public sector experience with a focus on urban design, streetscape, park, trail and multi-modal transportation projects. Her expertise includes multi-disciplinary teamwork, project management, public participation, master planning, municipal and state agency permitting, design, bid documents and construction support services. Most recent park/ recreational facility projects include the Thompson Center Reuse Master Plan and Schematic Design in the Stony Brook Reservation of the Hyde Park neighborhood of Boston, MA, the Needham Reservoir ADA Trail in Needham, MA, Design improvements to the historic Battle Green in Lexington, MA, the Whittier Trail and landscape restoration in Newburyport, Salisbury and Amesbury, MA and the Concept Plan for improvements to the historic Olmsted Rockery in Easton, MA.

Amanda Sloan, RLA, ASLA – Public Outreach

Ms. Sloan, RLA, ASLA – Public Outreach Amanda is a specialist in recreational parks, rain gardens, and civic landscapes. She works intensively and successfully with community groups and stakeholders during the conceptual design phases of these projects, through meetings, charrettes, and site walks. She designed and project managed the award-winning signature park and multi-use, accessible path at Lake Massapoag in the center of Sharon, MA, which is now a section of the Bay Circuit Trail. A recent project was the development of a master plan for the multi-generational walking path surrounding Clay Pit Pond in Belmont, where she worked with the Conservation Commission, pond neighbors, the tree warden, the tree committee, the school, and other stakeholders to develop a plan upon which all could agree. An important aspect of this plan is its provision for connections to the proposed community path in the form of entry points where bikers can park their bikes, sit and rest, eat at picnic tables and learn about the pond through interpretive signage kiosks. She is currently involved with the creation of a new

passive park with ADA trail on the site of a former plant nursery on the shore of Black Pond, Chatham, MA, and recently worked on a section of bike path beside the Pawtucket River adjacent to City Hall in Pawtucket, RI. Drawing upon her background in art, community design, and natural science, she has 21 years of experience in landscape architecture, concentrating on civic projects including parks, recreation sites, conservation developments, low impact development designs, school and playground gardens, and planting design throughout New England.

Subconsultant Support

Toole Design – Trail Feasibility Studies

Founded in 2003, Toole Design Group (TDG) is the nation’s leading planning, engineering and landscape architecture firm specializing in bicycle and pedestrian transportation. TDG has a national reputation in transportation master planning, traffic calming, pedestrian and bicycle research and facility design, railtrail planning and design, transit accessibility, Safe Routes to School planning and design, and a variety of other related areas.

TDG has an outstanding reputation for results-oriented planning. Our plans identify specific locations for improvements, set priorities for implementation, and provide initial cost estimates. More importantly, the planning process builds momentum among city and elected officials, advocates and the general public to ensure projects and programs move forward immediately upon completion, and often even before the plan is completed. Their focus is in multimodal transportation – developing cost-effective, practical transportation solutions that move people efficiently, while improving the health and quality of life of the community. TDG has practical experience taking planning level concepts and turning them into reality. With design staff from varied backgrounds, they have the ability to take challenging and ambitious design goals and develop detailed documents that make construction go smoothly, minimize adverse impacts, and produce cost effective results. TDG has accomplished this on a variety of projects including, onstreet bike facilities, shared use paths, intersection and pedestrian safety improvements, streetscapes, parks and wayfinding sign systems.

As a recognized Bicycle-Friendly Business by the League of America Bicyclists, TDG is proud of their reputation for being green: approximately 90% of their staff use transit, bicycle and/or walk to work on a regular basis. TDG is a Woman-Owned Business headquartered in Silver Spring, MD, with over 100 employees in 10 offices throughout the country.

Wetland Strategies, Inc. – Wetland Assessments

Wetland Strategies, Inc. is Supplier Diversity Office certified as a Women Owned Business and a Disadvantaged Business Enterprise that offers professional wetland consulting services, including federal and state wetlands permitting, site review and development, and regulatory compliance. As the owner and principal of Wetland Strategies, Ms. Lenore White has over 25 years of professional experience in wetland science, soil science, water management strategies and regulatory compliance.

Resumes

Resumes for team members identified on the organizational chart are appended to this section.

Professional Overview

Mr. Lionetta is a Senior Vice President of BETA and has over four decades of technical, project and program management experience on transportation and civil engineering services to municipalities, federal and state agencies, in New England.

Mr. Lionetta's experience includes a full spectrum of client services ranging from the identification of funding sources, feasibility studies, conceptual design, planning, constraint identification and impact assessment, design development, construction documents and services during construction. Projects have included the study, planning and / or design of traffic devices, intersections, roadways, bridges, building sites, parks, intermodal facilities, rest areas, downtown improvements, as well as utility infrastructure. He also has led public involvement efforts and agency coordination.

In addition to his project based experience, Mr. Lionetta has extensive experience with the management of staff and overall group operations. His responsibilities include oversight of staff resources of the Norwood office, client satisfaction and the monitoring of quality control measures.

He has been actively involved in his Town government serving on its Capital Planning Committee for over 22 years. He has also served on many committees, including Play Field Management, School Rebuild and special projects.

Mr. Lionetta has served as principal-in-charge on a wide array of projects. Some of these projects include:

- Charles River Basin Synchronization Program – MassDOT
- Bowker Overpass Ramp Rehabilitation – MA DCR
- Traffic Signal Inventory / Upgrade Program – Barnstable, MA
- Route 9/ 27 Interchange Upgrade – Natick, MA
- Comprehensive Downtown Planning and Design – Framingham, MA
- Sagamore Circle Upgrade – MassDOT
- Providence Highway Bridge – MassDOT
- Route 44 New Alignment Highway – MassDOT
- On-Call Scoping Assignments – VTrans
- Height of Land Overlook/Route 17 – MaineDOT
- Traffic Calming Services – Cambridge, MA
- I-93 Visitor Center – Salem, NH - NHDOT
- On-Call Assignments – University of Connecticut
- Numerous Roadway Improvement Projects – Cities & Towns
- Numerous Traffic Improvement Projects – Cities & Towns
- Numerous On Call Services – State Agencies and Municipalities
- Numerous Downtown/Village Enhancement Projects

Training & Certifications

- Traffic Signal Systems – Georgia Institute of Technology
- Highway Capacity Manual – Polytechnic Institute of New York
- Traffic Management of Land Development – Northwestern University
- Various short courses on Project Management, Team Building, Presentation Skills and Risk Management
- OSHA Construction Safety and Health Training, 2007



Primary Discipline

Transportation

Years of Experience

- BETA: Since 2005
- Total: Since 1973

Education

- MS, Transportation Engineering, Northeastern University (1977)
- BS, Civil Engineering, Northeastern University (1973)

Registrations

- Professional Engineer – MA #30360, VT #7681, NH #6241

Affiliations

- American Society of Civil Engineers
- Institute of Transportation Engineers
- ACEC/MA, Transportation Agency Liaison Committee
- American Public Works Association, Awards Committee
- Massachusetts Highway Association
- Arlington Capital Planning Committee
- Arlington Play Field Committee
- Arlington School Building Committees
- Massachusetts Avenue Steering Committee

Professional Overview

Mr. McGrath has 32 years of experience in civil engineering, primarily in transportation and related fields for state transportation agencies, municipalities, airport commissions and commercial clients. He has been both project manager and project engineer on a variety of large and small transportation related projects. His experience includes highway design, traffic analysis and design, storm and sanitary sewer design, bridge inspection and rehabilitation, stormwater management design, canal improvements, utility design and the preparation of construction traffic management plans. He is also experienced in the preparation of right-of-way plans and documents for state- and federally-funded projects. Additionally, he has acted as a consultant for several local planning boards.

Mr. McGrath is familiar with the many permitting processes required for the implementation of most projects. He is experienced with the MEPA/EPA requirements and the preparation of ENF/EIR. He has worked with a variety of computer software including AutoCAD, Land Development, SCS TR-20 and TR-55, Haestads Methods Pond 2, HydroCAD, HCM and CINCH.

Mr. McGrath serves as the coordinator of the QA/QC program for BETA's Lincoln, RI office.

Transportation/Traffic

Cochituate Rail Trail – Natick, MA

- Project Manager for the design of 2.4 miles of a new bike trail along the Saxonville Branch Railroad Right of Way. The project extends from the Framingham Town line to Natick Center including five at grade intersection crossings, refurbishment of an existing railroad bridge over Route 9 and a connection to the Natick Commuter Rail Station.
- The design will evaluate options for crossing Route 30 on a grade separated structure. Work includes horizontal/vertical alignments, stormwater management, bridge design, landscape architecture and traffic design

Connecticut Riverwalk North – Chicopee, MA

- Project Engineer for the design of a 2.8 mile bike path along the Connecticut River. This segment is part of a 20 mile path system. The path is located adjacent to a flood control dike.
- Key elements include horizontal/vertical alignments, development of scenic overlook areas, floodplain impacts, design of a prefabricated 65 foot long bridge, connections to the adjacent neighborhood and public outreach.
- The project is being funded through the MassDOT Transportation Improvement Program.

Lake Avenue North Linear Park and Shared Use Path – Worcester, MA

- Project Manager for preparation of a feasibility study and concept design for approximately 3 miles of shared use bicycle/pedestrian path and linear park on Lake Avenue and Lake Avenue North adjacent to Lake Quinsigamond, a major recreational lake.
- The project will enhance public enjoyment of the lake and will provide a pedestrian/bicycle connection between Lake Park, a state park at the southern end of the corridor and Regatta Point State Park north of Route 9. Other features include development of overlook/viewing areas, a canoe/kayak launch, development of passive recreation open space. Portions of the path will be integrated into MassDOT's replacement of the Ken Burns Bridge (Route 9) over Lake Quinsigamond.



Primary Discipline

Transportation

Years of Experience

- BETA: Since 2008
- Total: Since 1982

Education

- B.S., Civil Engineering, Worcester Polytechnic Institute (1982)

Registrations

- Professional Engineer: MA #33716, RI #9402, CT #27873, VT #7722

Training and Certifications

- Traffic Analysis Program, Northwestern University

- Work includes development of typical cross sections, conceptual layout of path and identification of locations for parking areas, grading and retaining wall design, stormwater management & drainage, identification of constraints and preparation of a design report. The project requires close coordination with the City and MassDOT

Downtown Sidewalk and Streetscape Improvements – Worcester, MA

- Project Manager for the design of new sidewalks, streetscape and pavement improvements and traffic signal upgrades in the Central Business District. The project includes over 10,000 feet of sidewalk, 6,000 feet of roadway and 14 signalized intersections along Main Street, Franklin Street, Front Street, Commercial Street and Foster Street.
- Work includes new sidewalks, wheelchair ramps, upgrade and coordination of traffic signals, roadway rehabilitation, drainage modifications, streetscape and street lighting.
- In order to meet ADA requirements within this very constrained corridor, a two-tiered sidewalk system was developed. This provides an ADA accessible path while also maintaining access to numerous adjacent buildings. Wheelchair ramps were designed using the PROWAG guidance. APS was incorporated into traffic signal designs. The project is funded through a combination of local and federal funding.

Fuller Brook Park Preservation Project – Wellesley, MA

- Coordinated design effort for the restoration and preservation of an historic park in Wellesley, MA
- Design included plans, specifications and estimate for trail rehabilitation, drainage improvements, streambank repairs and stabilization, wayfinding and interpretive signage, removal of invasive plant material

Rails to Trails – Wakefield & Lynnfield, MA

- Coordinating the design of a 4.3 mile multi-use path along an existing abandoned rail bed beginning in Wakefield near the Galvin Middle School, extending through Lynnfield and ending at the Peabody city line.
- The project includes on-road bicycle lanes, parking areas, safety improvements at roadway crossings and landscape enhancements. Roadway crossings include both signalized and un-signalized intersections. A 4,800 foot long elevated boardwalk is proposed through an ACEC to minimize floodplain impacts. Scenic overlooks will be included in the trail alignment at points of interest.
- Key design issues include stormwater management, flooding concerns, evaluation of the structural integrity of soils within the rail bed and environmental impacts. The project includes a significant public outreach and participation component.
- Construction funding for the project will be through MassDOT's Transportation Improvement Program (TIP).

Assabet River Rail Trail - Marlborough/Hudson, MA

- Senior Project Engineer responsible for design oversight and quality control for a 5 mile "Rails to Trails" multi-use trail. The trail follows an abandoned rail right of way as well as utilizing existing streets. The project included construction of a new underpass under Route 85 and rehabilitation of an existing railroad bridge over the Assabet River.
- Work included horizontal and vertical geometry, grading, drainage improvements, traffic signal modifications, bicycle/pedestrian crossings, preparation of Right of Way documents, structural design and construction services.

Province Lands Bicycle Trail Assessment - Provincetown, MA (National Park Service)

- Senior Project Engineer responsible for the assessment and recommended improvements to address safety issues along the Province Lands Bicycle Trail, a 7 mile system of trails on Cape Cod.
- Work included field review of the entire trail system, assessment of horizontal and vertical geometry, pavement condition, trail crossings and signing for recommended safety improvements. Preliminary level recommendations were developed for short and long term improvements and coordinated with the Park Service.

Spring Street, Sidewalks and Traffic Signal – Lexington, MA

- Lead Engineer for the preparation of plans, specifications and estimates for the construction of intersection improvements, new sidewalks, curbing, and installation of a new traffic signal on Spring Street and Marrett Road, a densely developed residential neighborhood.
- The work included conceptual and final design of sidewalk alignments, geometric improvements to the intersection of Spring Street and Marrett Road, mitigation of grading impacts, traffic signal design, installation of high visibility pedestrian flashers, installation of radar speed signs, drainage modifications and layout of new pavement markings and signing.
- The project involved multiple public presentations, as well as, meetings with individual property owners. The work also involved coordination with MassHighway to obtain a State Highway Access Permit.

Retaining Walls - Ashfield and Conway, MA (MassDOT)

- Project engineer responsible for the preparation of plans, specifications and estimate for highway design associated with the reconstruction of three retaining walls along Route 116.
- Work included reconstruction of roadway to current design standards, improvements to storm drainage, development of traffic management plans during construction, and preparation of right of way and layout alteration plans.
- Work also included preparation of supporting documentation for environmental permitting, including Environmental Notification Form and Notice of Intent.

North River Canal Linear Park and Canal Walls - Salem, MA

- Project engineer for the development of a linear park and the reconstruction and realignment of timber canal walls along the North River Canal between Flint Street and Route 114.
- The work included hydraulic analysis to determine flood elevations, layout of a pedestrian path, grading and drainage, design of two pedestrian bridges over the canal, parking lot and roadway layout and design.

North End Parks - Boston, MA (MBTA)

- Project Engineer responsible for civil engineering design related to the design of the North End parks. These parks are part of the Central Artery Rose Kennedy Greenway parks and are located within a densely developed urban area.
- Work included grading, drainage, structural design for water feature, coordination with Landscape Architect, and development of construction staging and traffic management plans.

Professional Overview

Mr. Ogilvie has 20 years of design experience in transportation, specializing in highway design and stormwater management systems. He has been involved with the design of numerous highway projects. Mr. Ogilvie has a comprehensive knowledge of Massachusetts Department of Transportation and AASHTO standards. He has prepared hydrologic and hydraulic reports for both municipal projects and regional studies. Working as a project manager, he served as a valuable team leader and mentor with other design engineers, recently managing a variety of MassDOT projects. Mr. Ogilvie successfully managed project budgets and schedules. He attended numerous meetings for various Planning Boards, Conservation Commissions and Select Boards.

Town of Natick, Cochituate Rail Trail, Natick, MA. Senior Project Engineer for the design of 2.4 miles of a new bike trail along the Saxonville Branch Railroad Right of Way. The project extends from the Framingham Town line to Natick Center including five at grade intersection crossings, refurbishment of an existing railroad bridge over Route 9 and a connection to the Natick Commuter Rail Station. The design includes a pedestrian overpass spanning Route 30. Work includes horizontal/vertical alignments, stormwater management, bridge design, landscape architecture and traffic design.

Town of Acton, Assabet River Rail Trail Conversion Design, Acton and Maynard, MA
Project manager for the conversion of an abandoned rail bed to an active bicycle and pedestrian path. Prepared plans for 3.5 miles of a 12 foot wide multi use path primarily on an abandoned rail bed. Prepared multiple alternative alignments for sections of path that connected through downtown Maynard and other private property. Prepared plans and estimates for MassDOT milestone submittal. Also presented the project at public hearings to gain community support.

City of Lowell, Concord River Greenway, Lowell, MA
Project Manager for detailed civil and structural engineering, survey base mapping, right of way planning and acquisition, landscape architecture, and environmental permitting for a 4.8-mile recreational trail to connect downtown Lowell with the Bruce Freeman Trail, and the larger regional Bay Circuit Trail.

Town of Waltham, Wayside Rail Trail, Waltham, MA
Project manager for the conceptual design of 3.2 miles of bike path using an existing railroad bed as a multi-use recreational facility. Prepared conceptual plans for the city's use in obtaining enhancement funding for the project. Coordinated staff efforts in assessing traffic conditions at proposed intersection crossings and structural review of two existing bridges. Prepared plans detailing right-of-way issues for the city's use in obtaining the property rights from the Massachusetts Bay Transit Authority.

National Park Service, Fall Overlook Greenway, Lowell, MA
Project manager for the planning, environmental permitting, landscape architecture, structural and civil engineering and related services involved in the design of improvements consisting of a public walk and greenway along the north bank of the Merrimack River. Prepared the conceptual, preliminary and final design on the walkway. Overseeing the production of alignment, grading and structural plans and estimates. Coordinated the work of the landscape architect in the design of the landscape areas, identification of features such as handrails, benches, bike racks, plantings, pedestrian lighting and one wayside area



Primary Discipline

Transportation

Years of Experience

- BETA: Since 2012
- Total: Since 1994

Education

- B.S., Civil Engineering, ,
Lehigh University (1994)

Registration

- MA PE License #41342

Affiliations

ASCE

Certifications

- Field Safety 4-Hour
03/03/2005
- OSHA 10-Hour Construction
Safety 05/06/2007
- General Excavation Safety
Training-Awareness
04/29/2008
- Trench/Excavation Safety
Training-Awareness
04/29/2008
- Project Management Training
- Basic 05/19/2006

for viewing the existing falls. Oversaw the work of a structural engineer in the design of two pedestrian bridges.

National Park Service, Upper Pawtucket Canal Walk, Lowell, MA

Project manager for the planning, environmental permitting, landscape architecture, structural and civil engineering and related services involved in the design of improvements consisting of a public walk along the south bank of the canal. Prepared the conceptual, preliminary and final design of the walkway. Overseeing the production of alignment, grading and drainage plans and estimates. Coordinated the work of the landscape architect in the design of landscape areas and identification of features such as handrails, benches, bike racks and plantings, pedestrian lighting.

City of Cambridge, Flagstaff Park and Cambridge Common Improvements, Cambridge, MA

Project manager for the design of a multi-use path through Flagstaff Park and the reconstruction of the existing pathways within Cambridge Common. The project involves the modification of the existing traffic signals at Massachusetts Avenue at Cambridge Street and Massachusetts Avenue at Garden Street. The intersections will be modified to include an improved pedestrian and bicycle access to the Cambridge Common and also improve traffic flow in this congested area. The park areas will be rehabilitated and extensive landscape architecture work is being done to revitalize the park areas.

Department of Conservation & Recreation (DCR), Reconstruction of Woodland Road, Stoneham & Medford, MA Project engineer responsible for the reconstruction of approximately 1.25 miles of DCR parkway. The project includes the addition of traffic signals, a shared use path and a roundabout. Responsible for the design of the roadway layout and assisted in the preparation of construction plans, estimates and Environmental Notification Form (ENF).

Boston University, Reconstruction of Commonwealth Avenue, Boston, MA

Project engineer for the reconstruction of Commonwealth Avenue in the area of the Boston University Campus. The project involves the creation of a separated bicycle lane. Work includes pavement rehabilitation, landscape and lighting improvements and improved pedestrian and bicycle accessibility. Responsible for coordinating the work between disciplines in the preparation of a MassDOT milestone submittal.

Town of Westwood Planning Board, Peer Review University Avenue, Westwood, MA

Peer review of roadway and site design of a large scale mixed use development for the Town of Westwood. The project involves the extensive redevelopment of the University Avenue Industrial Park into a vibrant, mixed use, smart growth pedestrian oriented community. In total the development will comprise of approximately 150 acres of mixed use development including residential, retail, hotel, office and public open space. Assisted the Town by reviewing the site development plans for consistency with Town regulations and standard engineering practice.

Town of Uxbridge, Route 122 North and South Main Street Reconstruction, Uxbridge Massachusetts. Project Engineer responsible for the continuing design of 3.0 miles of Route 122 through both commercial and residential neighborhoods. The project includes pavement rehabilitation, traffic signal improvements, addition of sidewalks on both sides of the roadway and widened shoulders for bicycle accessibility. Coordinated staff and assisted in the production of plans, specifications and estimate for a MassDOT submittal.

City of Holyoke, Lower Westfield Road and Homestead Avenue Intersection Improvements, Holyoke, MA Project manager for the design of intersection improvements at Lower Westfield Road and Homestead Avenue. The project is the implementation of the major recommendations of the Ingleside Traffic Study and the improvements include the addition of turning lanes and increased capacity at this congested intersection.

Massachusetts Highway Department, Route 132 Landscape Review, Barnstable, MA Project manager for review of the landscape improvements design along the Route 132 highway corridor. Managing evaluation of the plans and cost estimate produced by the landscape architect for conformance to Massachusetts Highway Department standards for a 25% submission.

Town of Barnstable, Route 132 Construction Services, Barnstable, MA Project engineer for construction services for a 2-mile roadway improvement project. Conducting the bimonthly on-site construction meeting, monthly site visits, shop drawing reviews, interpretations and clarifications of the contract documents, and as-needed construction engineering services.

North Andover Department of Public Works, Mosquito Brook Hydrologic Review, North Andover, MA

Reviewed the hydrologic and hydraulic conditions in the Mosquito Brook watershed, particularly several target areas that had experienced recent flooding. Reviewed the FEMA Flood Insurance Study and flood Insurance rate maps to assess flood conditions in the watershed. Performed hydraulic and hydrologic analyses at problem areas to assess possible methods of alleviating flood conditions. Prepared a report summarizing problems and feasible solutions.

Professional Overview

Mr. Boynton has worked as an engineer in the Transportation, Civil/Site, Environmental, and GIS departments at BETA Group, Inc. His experience includes roadway design, streetscape design, storm and sanitary sewer design, and the preparation of plan sets for state transportation agencies and municipalities. He is also experienced in shared-use path, bicycle path, and sidewalk design which meet the industry standards for user accessibility.

Through his time at BETA and previous experiences, Mr. Boynton has acquired experience on a variety of engineering and mapping tasks. His software experience includes AutoCAD Civil 3D, AutoCAD Land Desktop, and ESRI ArcGIS. He is also proficient in stormwater and sewer modeling with the programs HydroCAD, Hydraflow, EPA SWMM 5.0, and PCSWMM.NET.

Highway/Site Design Projects

On-Call Roadway Rehabilitation – Framingham, MA

- \$3.8 Million road rehabilitation project incorporating multiple streets throughout Framingham including Oran Road, Guadalcanal Road, Speen Street, A Street, Lincoln Street, Vernon Street, and Oak Street.
- Developed concept level plans to be used as reference for sidewalk design and geometry modifications to the roadway
- Provide on-call resident engineering services which includes oversight of ADA compliance for wheel chair ramp and sidewalk design

Worcester Central Business District Streetscape Improvements – Worcester, MA

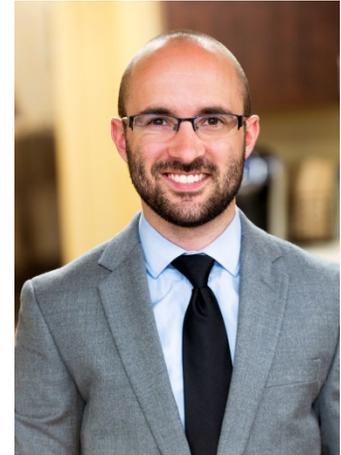
- Assisted in the development of 25% MassDOT design plans for 1.34 mile streetscape improvement project along Main Street within the Central Business District in downtown Worcester.
- Project Engineer responsible for the geometric design of Main Street corridor including alignments, profiles, lane configuration, and multiple design options to meet bicycle accommodations.
- Project Engineer responsible for ADA accommodations which included the design of a bi-level sidewalk and wheel chair ramps.

Downtown Sidewalk Improvements Project – Worcester, MA

- Assisted in the development of plans from conceptual phase through PS&E submission for streetscape improvement project along 2,700 linear feet of sidewalk within the Central Business District in downtown Worcester.
- Developed the narrative submitted to the Architectural Access Board for a successful application for variance.
- Project Engineer responsible for the geometric design for segments of Franklin Street, Front Street, Foster Street, and Commercial Street including alignments, profiles, and lane configuration.
- Project Engineer responsible for ADA accommodations which included the design of a bi-level sidewalk and wheel chair ramps.

Prospect Street – Framingham, MA

- Assisted in the road design and cost estimate for approximately 4,500' of roadway
- Improvements included road reclamation, milling and overlay, drainage improvements, and new HMA sidewalks.



Primary Discipline

Civil/Site

Years of Experience

- BETA: Since 2009
- Total: Since 2009

Education

- BS, Civil and Environmental Engineering, University of Massachusetts Dartmouth (2009)
- OSHA – 10 Hour Construction Safety & Health #001430736

Registrations

- Professional Engineer: MA#51178, RI #11736

Affiliations

- Member ASCE (2005 – Present)

Provided construction services as needed

Conley Street Terminal (Massport) – Boston, MA

- Redesign of a the ship loading facility at the Conley Terminal
- Project includes converting an existing material stockpile site into a truck queuing area, increasing security with gate and fenced stacking area, and redesigning parking lot adjacent to truck facility
- The scope was to increase the capacity of the terminal to accommodate a larger shipment volume, while allowing efficient movements within the site.
- Phasing Plans were developed to provide continuous functionality during the construction.

Route 138 Roadway Improvements – South Kingston, RI

- Assisted in design of grading and contours for drainage features
- Developed profiles for proposed water quality best management practices
- Developed roadway cross sections showing existing and proposed utilities using Land Desktop
- Prepared soil maps for drainage report
- Quantity and cost estimation
- 75% Right-of-Way plans for easements and land takings

Roadway Construction Route 9 and Route 27 – Natick, MA

- Project Engineer responsible for developing the 25% Preliminary Right of Way Plans

Emergency Roadway Repair West Natick Road and Route 5 – Warwick, RI

- The roads located in front of the Warwick Mall received severe structural damage from a storm in the spring of 2010. RIDOT and BETA worked together in an expedited design process to complete the final design submission within 10 days of the initial site visit.
- Assisted in the development of design plans
- Developed cost estimate and conducted field work

Taunton Street – Wrentham, MA

- Work Includes drainage improvements, road reconstruction, and box widening.
- Developed Traffic Management Plan (TMP)
- Monitored On-site test pit and perk tests for drainage features
- Drafted Preliminary 75% ROW Plans
- Assisted in the Preparation of the Environmental Notification Form (ENF)

Safe Routes to School – Woonsocket, RI

- Drafted site preparation and construction plans for school intersection design
- Researched proper signage per MUTCD standards to be applied to school zones
- Work includes preparation of a Design Study Report at each location including traffic and pedestrian analysis, design of curb bump-outs, enhanced crosswalks, new traffic signal, ADA compliant crossings, signing and pavement markings.

Waltham Street Pedestrian Crossing – Lexington, MA

- Used GIS to create base maps
- Conducted pedestrian study and gap study to determine if a crosswalk is warranted

Route 138 – South Kingston, RI

- Assisted in design of grading and contours for drainage features such as swales and detention basins
- Developed cross sections for proposed water quality best management practices
- Prepared soil maps for drainage report
- Quantity and cost estimation

Kingston Station Parking Lot Extension – South Kingston, RI

- Evaluated existing property features
- Drafted concept design options to expand the existing parking capacity

Concord Street Traffic Management Plan – Framingham, MA

- Developed a Traffic Management Plan (TMP) for water main construction
- Designed phasing schedule for construction as well as detour routes to avoid water main replacement

Gas Station and Convenient Store Design – Southeastern, MA*

- Site design for gas stations and convenient stores in Southeastern Massachusetts
- Grading, layout, parking lot, and architectural floor plan/elevation design
- Performed design calculation for underground storage tanks and anchor support systems

Sewer Separation and Combined Sewer Overflow Projects

Park River, Contact 1 – Contract 4, Metropolitan District Commission Clean Water Project – Hartford, CT

- Project includes sanitary sewer and storm water separation as part of a city water effort to eliminate combined sewer infrastructure. This work includes property plumbing reconfiguration to eliminate roof discharge into the sanitary sewer system.
- Performed hydrologic and hydraulic modeling to determine sanitary and storm peak flow rates, estimate existing system capacity, identify system capacity deficiencies, and evaluate recommendations of the 30% Design from the Preliminary Design Report.
- Used Oracle database system to find sewer and sewer service record information.
- Assisted in the 30% preliminary sewer layout and profile.
- Generated GIS maps to show pipe defects found in CCTV inspection report and made recommendation as to which sewer pipes and laterals should be re-televised based on condition.

Farmington Avenue – Contract 4, Metropolitan District Commission Clean Water Project – Hartford, CT

- Project Engineer responsible for utility coordination and record plan information using the Oracle database. Utility information was used to supplement base plan information where needed.
- Utility relocation including the water main relocation design and 30% plan preparation.
- Assisted in modeling the existing combined sewer system and the proposed improvements using SWMM 5.0.
- Assisted in the writing and preparation of the Hydraulic Model Report. This included generating figures of the node flooding, pipe surcharge, and stormwater profiles using GIS software.
- Verified designed sewer pipe sizes with modeling and flow meter data
- Developed cross sections using AutoCAD Civil 3D 2010
- Review CCTV service lateral and sewer main inspections and made recommendations based on findings
- Performed Preliminary Cost Estimate for the 30% VE Submission

EPA Submission – Bristol, RI

- Used TP-40 & TP-49 rainfall frequency reports to generate storm intensities for model
- Constructed GIS maps to show Combined Sewer Overflow (CSO) modeling results

Eldridge Street Sewer Combined Sewer Overflow Modeling – Taunton, MA

- The Eldridge Street sewer system has been determined as an area of concern because monitoring shows that sanitary sewage overflows into the drainage system during high intensity rainfall events.
- Project Engineer responsible for site evaluation to determine drainage outfalls and watershed characteristics
- Used HydroCAD modeling software to analyze the locations and the rainfall intensity in which the sanitary flow spills into the drainage system
- The modeling data was used to confirm firsthand accounts of sanitary sewer overflows in the drainage system.

Cobb Brook (Upper) – Taunton, MA

- Watershed delineation and mapping
- Modeling using HydroCAD
- Project Engineer responsible for field investigation and recommendations regarding the maintenance necessary to improve water flow within the area of interest

Culvert Analysis Route 9 and Route 90 – Southborough, MA

- Created watershed and sub watershed delineations for culverts
- Defined soil types and percentages existing within watershed
- Used HydroCAD to calculate curve numbers and time to concentration values

GIS and Asset Management

Fairhaven Sewer and Drainage Mapping – Fairhaven, MA

- Digitized existing hardcopy sewer plans using GIS
- Updated GIS with incoming field data
- Conducted a town wide elevation survey of rim elevations for drainage and sewer systems
- Performed field inspection of various manholes to check invert, flow, size, and material accuracy

Lake Sabbatia – Taunton, MA*

- Bathymetric survey and perimeter survey to analyze lake level variation
- Constructed a sub watershed model used to aid in the design of a water quality sampling plan
- Developed locations at which water quality samples should be taken to monitor nutrients and pollutants
- With handheld GPS, located lake structures which were used to help establish a dock permitting process

Professional Overview

Mr. Gershman has more than 28 years of experience performing structural engineering for the preliminary and final design of numerous vehicular and pedestrian bridges; freight, commuter rail and transit bridges and facilities; and various marine terminal and waterfront projects. His responsibilities include managing a diverse staff of structural engineers and CAD technicians, while providing project management, performing quality assurance and quality control checks, as well as performing site investigations and evaluations, engineering designs, and preparation of contract plans, specifications and construction cost estimates.

Bridge Rehabilitation and Replacement

Blackstone Street over Blackstone River – Sutton, MA (MassDOT)

- Project includes the complete replacement of the existing bridge immediately downstream from an early 19th century dam. The existing two span bridge will be replaced with a much wider and longer single span structure to improve pedestrian and vehicular safety while minimizing work within the river.
- Project Manager responsible for the complete highway, traffic and bridge design as well as all environmental permitting.

Route 122 over Muddy Pond Brook – Oakham, MA (MassDOT)

- Project required the removal and replacement of the bridge superstructure while maintaining one-way alternating traffic via temporary traffic signals during construction.
- Project Manager responsible for the complete highway, traffic and bridge design as well as all environmental permitting.

Route 2A (King Street) over Route 495 NB & SB – Littleton, MA (MassDOT)

- This \$4 million project required the removal and replacement of the existing bridge concrete deck, sidewalk and barriers while maintaining traffic on Route 2A and Interstate 495 below.
- Project Manager responsible for the complete highway, traffic and bridge design as well as all environmental permitting.

Hamilton Street over Route 2 – Leominster, MA (MassDOT)

- Project required the removal and replacement of the bridge superstructure, a 195 ft long two span continuous steel structure, while maintaining one-way alternating traffic via temporary traffic signals during construction.
- Project Manager responsible for the complete highway, traffic and bridge design.

Danforth Street over Sudbury River – Framingham, MA (MassDOT)

- Project is part of MassDOT's Accelerated Bridge Program
- Project required the removal and replacement of the bridge superstructure, a 125 ft long two span steel structure, as well rehabilitation of the substructure elements for reuse.
- Project Manager responsible for the complete highway, traffic and bridge design and environmental permitting.
- Project required the coordination of the project with the Army Corps of Engineers and the Saxonville Levee Flood Control structures.



Primary Discipline

Structural

Years of Experience

- BETA: Since 2007
- Total: Since 1986

Education

- M.B.A. – Bryant University (2006)
- B.S., Civil Engineering – Wentworth Institute of Technology (1986)

Registrations

- Professional Engineer – MA #38751, RI #6696, CT #25961

Certifications

- OSHA – Construction Safety & Health – 10 Hour Training Course
- NH DOT: LPA Certification Training

Affiliations

- Boston Society of Civil Engineers Section (BSCES)
- BSCES Structure Group Executive Committee – Member and Past Chair
- American Society of Civil Engineers (ASCE)

Central Street over Sudbury River – Framingham, MA (MassDOT)

- Project required the removal and replacement of the bridge superstructure consisting of, a 95 ft long single span structure comprised of concrete New England Bulb Tee girders.
- Project Manager responsible for the complete highway, traffic and bridge design and environmental permitting.
- Project required the coordination of the project with the adjacent Central Street Dam and Saxonville Levee Flood Control structures.

Wickford Road over Sudbury River – Framingham, MA (MassDOT and Town of Framingham)

- Project required the removal and replacement of the bridge superstructure, a 150 ft long two span steel structure, as well rehabilitation of the substructure elements for reuse.
- Project Manager responsible for the complete highway, traffic and bridge design and environmental permitting.

Bay Street over Mill River – Taunton, MA (MassDOT)

- Project is part of MassDOT's Accelerated Bridge Program
- Project required the complete removal and replacement of the existing single span bridge over the Mill River as well as the removal and replacement of the adjacent dam, training walls and fish ladder. The proposed bridge is a 75 ft single span structure comprised of prefabricated bridge units with the abutments founded on secant pile walls.
- Project Manager responsible for the complete bridge design and coordination with the associated highway work as well as the adjacent dam, training walls and fish ladder.

Washington Street over Mill River – Taunton, MA (MassDOT)

- Project is part of MassDOT's Accelerated Bridge Program
- Project required the complete removal and replacement of the existing two span bridge with a 75 ft long single span structure with new abutments.
- Project Manager responsible for the complete highway, traffic and bridge design and environmental permitting.
- Project required coordination and relocation of numerous underground utilities, integration of new traffic signals at the intersection of Washington Street and Frederic R. Martin Sr. Parkway, as well as the coordination of the traffic signals with those at the intersection of Court Street and Tremont Street.

CSX Bridge Bundle #1 – Richmond, Chester, Hinsdale and West Springfield, MA (MassDOT)

- This Design / Build project provided for increasing the vertical clearance over the CSX Transportation railroad under six bridges in western MA under an agreement between CSXT and the Commonwealth.
- Project required the complete removal and replacement of the Bridge Street Bridge and the Route 8 Bridge over CSXT in Hinsdale. The Bridge Street Bridge is a 56 ft single span structure comprised of precast concrete deck beams while the Route 8 Bridge is a 85 ft single span structure comprised of rolled steel beam. The Bay State Bridge in Chester entails the jacking of existing butted box beam bridge to achieve the desired vertical clearance.
- Project Manager responsible for the complete highway, traffic, bridge and environmental permitting as well as the coordination of the project with MassDOT and the Design Build Contractor.

Revere Beach Parkway (Route 16) over MBTA – Medford, MA (MassDOT)

- Project is part of MassDOT's Accelerated Bridge Program
- Project required the complete removal and replacement of the existing three span bridge with a 205 ft long two span continuous structure with new abutments.
- Project Manager responsible for the complete bridge design and extensive coordination with the associated highway, traffic and environmental permitting.
- Project required complex staging to allow for the continuous flow of six lanes of vehicular traffic along with maintaining pedestrian access across the bridge.

Route I-495 over the Concord River, B&M Railroad & Woburn Street – Lowell, MA (MassDOT)

- This \$15 million project required the replacement of three twin structures (six bridges) carrying Route I-495 through the City of Lowell as well as environmental permitting, coordination with the MBTA and B&M Railroad.
- As Project Manager, was responsible for the overall project including highway design, traffic management and final bridge design utilizing the latest AASHTO and MassDOT requirements.
- Due to high volume of traffic, staging of the bridges was required through the use of median crossovers in order to maintain three lanes of traffic in each direction at all times.
- Project was selected by MassDOT to be constructed as a design/build project delivery system

Route 88 over Westport River – Westport, MA (MassDOT)

- Project required the rehabilitation of the bridge including the replacement of the existing approach span superstructure, rehabilitation of the bascule span, and rehabilitation of the existing substructure.
- Prepared a field condition survey, detailed bridge inspection, Type Study Report, Bascule Evaluation Report, Geotechnical Report, Traffic Management Plans, final design, construction drawings, special provisions and construction cost estimates.

West Corner Bridge (Route 228) over Straits Channel - Hull, MA

- Project Manager responsible for the removal and replacement of a turn-of-the-century stone box culvert carrying the Straits Channel under Route 228.
- Replacement structure consisted of a double barrel pre-cast concrete culvert sized to maximize the tidal exchange into and out of Straits Pond.
- Self-actuated tide gates were mounted on the upstream end of the culvert to regulate the tidal flow and to allow for manual override of the system to artificially lower the water level in the pond to minimize potential flooding of abutter properties prior to a significant rainfall event.
- Complete removal and reconstruction of the culvert and utility relocations were also performed during the three-month closure of the roadway.

Sharon Road over Mad River Bridge Rehabilitation - Waterbury, CT

- Lead Structural Engineer responsible for the rehabilitation of this single span, multi-steel girder bridge over the Mad River in Waterbury, CT.
- Design services included performing a bridge inspection, material sampling and testing, preliminary design, permitting, maintenance and protection of traffic, and final design services.

North Street over West Brothers Brook Bridge Rehabilitation - Greenwich, CT

- Lead Structural Engineer responsible for the rehabilitation of this single span concrete slab bridge over the West Brothers Brook in Greenwich, CT.
- Design services included performing a field inspection, survey, replacement of the existing substandard bridge railing, and repairs to the bridge superstructure.

School Street Bridge over Cochituate Brook - Framingham, MA

- Lead Structural Engineer for the design of emergency repairs to the concrete slab bridge deck including construction inspection services.

Cobb Brook Flood Control Project - Taunton, MA

- Lead Structural Engineer for the layout, design and detailing of this 750 foot long flood control concrete box culvert.

Pedestrian and Bike Paths Projects

Cochituate Rail Trail Project – Natick, MA (Town of Natick)

- Project Manager for the preliminary and final design of two pedestrian bridges carrying the rail trail over Route 9 and Route 30 in Natick. The Route 9 crossing will use the existing stone abutments that supported the old rail bridge while the Route 30 location a new bridge. Both bridges will consist of single span prefabricated trusses.

Moffett Mill Pedestrian Walkway and Bridge - Lincoln, RI (William Warner Architects and RIDOT)

- Project Manager for the final design of a pedestrian walkway and a two span pre-fabricated truss bridge providing access from the adjacent parking area to the historic Moffett Mill building.

Aquidneck Island Passenger Rail/Bicycle Path Project – Newport, RI to MA State Line (RIDOT)

- Served as Senior Structural Engineer for the preliminary design of 16 miles of bicycle/multi-use trail along the Newport secondary right-of-way corridor from Newport, Rhode Island to the Massachusetts State line.
- Extension and rehabilitation of the existing railroad bridges was performed to carry the multi-use path in such a manner so as not to preclude future rail services.
- Project included the extension of numerous existing culverts as well as design of boardwalk structures with scenic overlooks on portions of the bike path.

Professional Overview

Mr. Freeman has 30 years of experience in the management and review of a wide range of industrial, commercial and public agency development projects. His background includes major transportation, coastal development and dredging, energy and land development projects. He is thoroughly familiar with the Massachusetts Environmental Policy Act (MEPA) and National Environmental Policy Act (NEPA) processes, as well as current environmental regulatory and permit requirements. He has extensive experience in the permitting of linear transportation projects in Massachusetts. Mr. Freeman is a former analyst with the MEPA Unit, where he was principally responsible for the review of more than 250 projects.

Transportation

Mr. Freeman's transportation-related projects prior to joining BETA include the following:

MassDOT Highway Division, Statewide Stormwater Discharge Compliance, 2010 2015

Project Manager and Regulatory Specialist on two consecutive, multi-year contracts to help MassDOT comply with the statewide National Pollutant Discharge Elimination System (NPDES) stormwater permit for discharges of highway runoff to impaired waters. The scope of work includes preparation of watershed assessments to determine stormwater Best Management Practice (BMP) requirements, GIS mapping and database management, topographic survey, BMP engineering and design, and environmental permitting services. Evaluated over 200,000 acres of impaired waters watersheds with MassDOT roadway discharges and developed designs for hundreds of acres of MassDOT roadways. Managed preparation of construction documents for all BMP design tasks to support existing MassDOT construction contracts and provided technical support services for quarterly court submittals by MassDOT.

MassDOT Highway Division, I-90/Allston Interchange Improvement Project, Allston/Brighton, 2013 2015

Environmental/Permitting Lead for the I-90/Allston Interchange Improvement Project. Managed preliminary work for National Environmental Policy Act/ Massachusetts Environmental Policy Act (NEPA/MEPA) documentation and environmental permitting or the project including preparation of MEPA Environmental Notification Form (ENF). Participated in an extensive public participation process, including a series of stakeholder task force meetings to engage project area residents, advocacy groups and public officials in the concept development process and initiation of the initial environmental impact assessment process.

MassDOT Highway Division, Statewide Special Environmental Services Contract, 2011 2015

Project Manager for two consecutive, multi-year statewide Special Environmental Services contracts for MassDOT that supports a variety of projects, from routine roadway projects to major projects and projects identified under the Accelerated Bridge Program. Completed or initiated more than three dozen assignments on a variety of projects.

MassDOT Highway Division, I-95/Whittier Bridge Improvements, Newburyport, Amesbury, Salisbury, MA, 2009 2015

Managed preparation of a joint NEPA Environmental Assessment (EA) and MEPA Environmental Impact Report (EIR) for 4 miles of highway widening and replacement of the I-95 bridge over the Merrimack River, a key project under the Accelerated Bridge Program (ABP). Key issues included: rare species (Sturgeon in the Merrimack River); wetlands; historic



Primary Discipline

Environmental Documentation and Permitting

Years of Experience

- BETA: Since 2015
- Total: Since 1986

Education

- MA, Urban and Environmental Policy, Tufts University, 1986
- BA, Liberal Arts, Goddard College, 1978

Professional Affiliations

- American Council of Engineering Companies (ACEC)
- American Society of Civil Engineering - Boston Society of Civil Engineers, Waterways Technical Group
- ACEC/MA – Energy and Environmental Affairs Committee, Co-Chair
- Zoning Board of Appeals, Hingham, MA

resources; navigation impacts; air quality, including GHG; highway noise; impacts to abutters and water supply protection. Managed a multidisciplinary team in the preparation of the EA/EIR and environmental permit applications to meet the demanding ABP schedule.

MassDOT Highway Division, I-495/Route 126 Interchange Improvements, Bellingham, MA, 2010 2015

Assisted with permitting for design improvements to address interchange operations at a high accident location at the southbound ramp terminals at Route 126. A new multi-lane modern roundabout is proposed to replace the existing signalized ramp terminal. The project requires the preparation and filing of an Environmental Assessment (EA) and Interchange Justification Report (IJR) with the Federal Highway Administration (FHWA). Other major elements include shifting the southbound off-ramp further south, a new northbound on-ramp, coordinated traffic signal improvements, adding major culverts to address DEP Stream Crossing guidelines, cast-in-place retaining walls and stormwater detention basins.

MassDOT Highway Division, I-93 and Route 110/Route 113 Interchange Reconstruction Project, Methuen, MA, 2008 2015

Managed preparation of a joint NEPA EA and MEPA EIR for improvements to the Route 110/113 interchange with I-93. Significant issues include traffic, noise, and air quality (as this project was the first highway project to be scoped by MEPA for a GHG analysis), and wetlands. The project required a Variance from wetlands regulations. Due to the inability to mitigate wetland impacts within the project limits, an off-site wetlands mitigation site is being developed, and approvals were obtained from the Army Corps of Engineers and MADEP. MEPA approved the Draft EIR as a Final EIR, saving time and money for the project.

USACE Mobile District and Millennium Challenge Corporation, Roadway Design, Environmental and Social Impact Assessment, and Resettlement Action Plan, Wright-Taft-Sulat Roadway Project, Samar, Philippines, 2011 to 2012

Task Manager for the environmental and social impact assessment, and resettlement action plan for the rehabilitation of 82 km of roadway in Samar and Eastern Samar Provinces including an Environmental Impact Statement (EIS) under the provisions of the Philippines DENR Revised Procedural Manual for DENR Administrative Order No. 30 Series of 2003 (DAO 03-30) and the MCC Environmental Guidelines. Activities included the largest public scoping meeting in the history of the Philippines EIS process, a detailed environment data collection and field investigation program, and preparation of an Environmental and Social Management Program detailing environmental and social mitigation and monitoring measures to be implemented during and after project construction.

Massachusetts Department of Conservation and Recreation (DCR), Boston University Bridge Permitting, Cambridge and Boston, MA, 2005 to 2006

Project Manager for delineation of wetland resources on the bridge alignment, and prepared and submitted environmental permit applications, including notices of intent to the Boston and Cambridge Conservation Commissions under the Massachusetts Wetlands Protection Act, Department of the Army permit under Section 404 of the Clean Water Act, Section 401 Water Quality Certification, and Massachusetts Coastal Zone Management Consistency Determination.

Florida Department of Transportation, Central Florida Commuter Rail Transit (CFCRT) Project, Volusia, Seminole, Orange and Osceola Counties, FL, 2004 to 2006

Manager of environmental documentation for SunRail, a CFCRT project that included implementation of commuter rail service on an existing 61-mile rail corridor. Prepared NEPA Class of Action determination, EA, and Finding of No Significant Impact (FONSI) documentation in accordance with the Federal Transit Administration (FTA), NEPA and the Florida DOT's *Project Development and Environmental* manual. Managed multidisciplinary staff, including subconsultants, in the preparation of social, natural and physical impact assessment and environmental document preparation. Participated in a comprehensive public involvement program including public informational meetings, agency coordination meetings and public hearings.

MBTA, Circumferential Transportation Improvements in the Urban Ring Corridor, Metro Boston, MA, 2001 to 2004

Developed NEPA/MEPA coordination and implementation strategy for preparation of phased transportation improvements capital construction program, including bus rapid transit (BRT) and light rail or heavy rail components. Prepared MEPA Expanded Environmental Notification Form (EENF) used in initiation of "scooping" process under Federal Transit Administration NEPA procedures and managed preparation of Draft EIR for Urban Ring BRT component.

MassDOT Highway Division, Sagamore Rotary (MA Route 3/US Route 6) Grade Separation, Bourne, MA, 2001 to 2004

Managed environmental documentation for a combined NEPA EA and MEPA EIR. Key issues included traffic and air quality, threatened and endangered species habitat; oil and hazardous materials; water quality and stormwater management; impacts to Section 4(f) recreational resources and historic and archaeological resources (Section 106). Environmental documentation strategy included extensive public outreach and coordination efforts to resolve controversy over preferred alternative and developing design refinements within the context of the environmental documentation process.

MassDOT Highway Division, I-93/Route 125 Interchange Improvements, Wilmington, MA, 1999 to 2000

Managed preparation of a combined NEPA Final EA and MEPA Final EIR. The document justified the need for significant wetlands alterations and included full documentation necessary for variance from state wetlands regulations. Document included full wetlands Functions and Values Assessment in support of future Section 404 permitting activities.

Martha's Vineyard and Nantucket Steamship Authority, Remote Parking Lots, Bourne, MA, 1998 to 1999

Managed preparation of ENFs under MEPA for construction of two remote parking lots for ferry customers off of Route 28. The first lot included spaces for up to 4,800 vehicles and was to be constructed in three phases over a period of five years on land located on the Massachusetts Military Reservation (MMR). Key issues included: traffic impacts on Route 28 "Otis Rotary" and Connery Avenue, the main access road into the MMR from Route 28; impacts to suspected rare and endangered species habitats on the site; compliance with the Massachusetts Stormwater Performance Standards; and development of a phased MEPA compliance strategy to allow for fast-track development of 900 spaces for the summer 1998 season via a MEPA Phase I waiver. The second remote parking lot for 900 vehicles was to be developed on a 13-acre site located on Route 28A in Bourne for the summer 1998 season. Prepared a fast-track ENF in response to the need to have an adequate number of parking spaces for peak summer traffic. Key issues included traffic impacts on Route 28 and 28A and the proximity of the site to a Bourne Water District water supply well. The Secretary of Environmental Affairs ruled that no EIR was required for the project.

MassDOT Highway Division and City of Westfield, Great River Bridge Traffic and Bridge Improvements, Westfield, MA, 1995 to 1998

Managed NEPA EA, MEPA EIR preparation, permitting strategy and preliminary design for construction of new highway bridge in the congested downtown. Key issues included traffic and parking impacts; wetlands, floodplains and water quality; historic property and parklands; and oil and hazardous materials. MEPA accepted the Draft EIR as a Final EIR, significantly shortening the permitting timeline for the project. The project was the first MassDOT project to be reviewed under the provisions of the 1996 Rivers Protection Act which established the Riverfront Area as a new jurisdictional wetland resource area under the Massachusetts Wetlands Protection Act.

MassDOT Highway Division, Fifth Street Bridge Reconstruction, Fitchburg, MA, 1996 to 1998

Managed preparation of NEPA documentation and environmental permitting for the replacement for the existing downtown bridge, including preparation of a preliminary site assessment for oil and hazardous materials; wetlands delineation under the Army Corps methodology; completion of a Categorical Exclusion checklist, as required by the FHWA; preparation of USACE Section 404 permit application; and preparation of a MADEP Section 401 Water Quality Certification application.

Worcester Office of Planning and Community Development, Central Street Gateway, Worcester, MA, 1994 to 1995

Managed preparation of NEPA Categorical Exclusion documents for submittal to MassDOT for FHWA approval; reviewed all existing EIRs related to ongoing work in downtown Worcester; and coordinated with MassDOT and the EOEA. Assisted in preparation of both Draft and Final EIRs, including traffic impact assessment and mitigation measure development, and provided liaison services with local and state regulatory agencies.

Town of Lexington, Marrett Road (Route 2A) Safety Improvements, Lexington, MA, 1992 to 1995

Managed preparation of Final EIR and environmental permitting for intersection improvements for a project adjacent to Minuteman National Historic Park and within the watershed of the City of Cambridge. Key issues included traffic analysis and engineering; impact on endangered species habitat; water quality/stormwater engineering; and wetlands mitigation and replication, including design of a 4,200 –square-foot wetlands replication area.

Professional Overview

Mr. Lucas has 20 years of experience in the traffic design, highway design and transportation planning fields. His responsibilities have included: design of traffic signal systems including closed loop signal systems, highway design, safety analysis, roundabouts, signage and pavement marking design, guide sign design, traffic management plans, construction staging plans, distribution of quantities, cost estimates, specifications, in addition to providing traffic assessments involving signal design/analyses, signal warrants, and crash analysis.

Mr. Lucas is very familiar with MassDOT Highway Division standards and policies. Mr. Lucas has presented at public hearings for MassDOT TIP projects statewide and has performed many public presentations in other communities. He is familiar with HCS, Synchro, SIDRA and RODEL traffic analysis software. His experience includes the following:

- Traffic Signal System Design
- Traffic and Guide Sign Design
- Traffic Management, Temporary Traffic Control and Construction Staging
- Traffic Signal System Inspection
- Plans, Specifications and Estimates
- Traffic Impact Studies
- Peer Reviews
- Safety Analysis including Road Safety Audits
- Parking Studies
- Public Presentations

On-Call Statewide Road Safety Audits, MassDOT Highway Division – Boston, MA

- Project Manager and lead engineer for over sixty Road Safety Audit (RSA) assignments throughout Massachusetts through MassDOT Highway Division's Safety Section.
- Facilitated audit meeting with a multi-disciplinary team, and led discussion during a site visit intended to identify and document existing safety deficiencies. Led a group discussion of safety issues and potential short-term and long-term countermeasures, and prepared a report summarizing the findings of the audit team.

On-Call Statewide High Crash Locations, MassDOT Highway Division – Boston, MA

- Lead Traffic Engineer for design of a new traffic signal and modifications to an existing signal in Brockton, and replacement of an existing signal in Easton.
- Responsibilities included traffic signal design, preparation of design plans, collection of traffic data, preparation of a Functional Design Report, and coordination with the highway design group on overall design approach and plan preparation.

University Station Peer Review - Westwood, MA

- Lead traffic reviewer as part of BETA's multidisciplinary team providing peer review services for the Town of Westwood for University Station, a 2.1M SF vibrant, mixed use, transit oriented development.
- Tasks include review of core development, as well as determining traffic impacts and coordinating mitigation on intersections Town-wide.
- Work with the Town and the developer, including meetings and public presentations before the Westwood Planning Board.

Water, Liberty and Pleasant Street Intersection Improvements – Quincy, MA

- Project Engineer for an intersection upgrade project including a new traffic signal.
- Prepared plans and construction documents detailing roadway improvements by a combination of milling & overlay and full depth box widening, sidewalk reconstruction, ADA-compliant handicap ramps, traffic signal installation, signs, pavement markings and temporary traffic control details.



Primary Discipline

Transportation

Years of Experience

- BETA: Since 1998
- Total: Since 1996

Education

- BS, Civil Engineering, Rensselaer Polytechnic Institute (1996)

Registrations

- Professional Engineer – MA Registration #48146 (2009)
- Professional Traffic Operations Engineer #2845 (2010)

Certifications

- Certified IMSA (International Municipal Signal Association) Traffic Signal Inspector (Cert #SI-103027)

Affiliations

- Institute of Transportation Engineers – Member

Blue Hill Avenue and Warren Street Traffic Signal Improvements – Boston, MA

- Project Engineer for safety and traffic signal improvements at 15 locations along Blue Hill Avenue and Warren Street.
- Conducted a traffic data collection program and field inventory detailing existing conditions and deficiencies.
- Project includes upgrade strategies and improvement recommendations at all locations, including upgrading and extending existing communications with the City's central traffic control system.

Hon. Gordon Owen Riverway and Williams Street Intersection Improvements – Taunton, MA

- Project Engineer for traffic and safety improvements at a high crash location including installation of a new traffic signal.
- Project development included consideration and development of a roundabout option.
- Prepared plans and construction documents detailing roadway improvements by a combination of milling & overlay and full depth box widening to provide exclusive turn lanes, sidewalk reconstruction, ADA-compliant handicap ramps, traffic signal installation, signs, pavement markings and temporary traffic control details.

Foundry Street (Route 106) at Prospect Street – Easton, MA

- Project Engineer for design of a new traffic signal and a slight lowering of the roadway profile to improve visibility.
- Prepared plans and construction documents detailing roadway improvements by a combination of milling & overlay and full depth box widening, sidewalk reconstruction, ADA-compliant handicap ramps, traffic signal installation, signs, pavement markings and temporary traffic control details.
- Prepared bid documents for the Town and performed construction services, including oversight of a full time inspector and a final signal inspection.

Statewide Signing Update – Statewide, MA (MassDOT)

- Project Engineer and lead signage designer for two primary assignments – I-195 from Seekonk to Dartmouth, and the Lowell Connector in Chelmsford and Lowell.
- Work included design of overhead and ground-mounted guide signs and structures meeting current Federal and State standards using SignCAD software.
- Project also included replacement of warning, regulatory and route marker signs, as well as extensive signing at the interchange ramps following state destination guide sign standards.

Peer Review Services – Statewide, MA (MassDOT)

- Lead Traffic Engineer for peer review services to MassDOT on 12 assignments to date.
- Advise on the completeness and readiness of projects to be bid as part of a multi-disciplinary team.
- The project assignments typically include a full review of the plans, specifications and construction estimate for each project and include review and counsel on a wide range design features including highway and traffic, structures, drainage, specifications, cost estimating, environmental design and overall constructability.

Reconstruction of Depot Street – Easton, MA

- Currently leading the traffic team on the 25% design for 2 miles of roadway reconstruction, including addition of turn lanes at key intersections and realignment and installation of a traffic signal at one location.
- The proposed signalized location involves coordination with Town staff regarding potential impacts and/or relocation of a historic Civil War monument.

Broadway (Route 129) Reconstruction – Lynn, MA

- Lead Traffic Engineer on design of a four-lane median separated Urban Principal Arterial. The purpose of the project is to implement capacity and safety improvements at three major signalized intersections.
- Evaluated and developed alternate lane configuration, signal phasing and coordination plans during the project lifecycle.
- Met with City officials and both residential and commercial abutters to ensure that the community's needs were accommodated while maintaining the safety and traffic improvement goals of the project.
- Prepared traffic signal plans, sign and pavement marking plans, and temporary traffic control plans along with specifications and construction cost estimates.

Dedham Square Improvements – Dedham, MA

- Lead Traffic Engineer on Dedham Square Improvements, which included reconstruction of an outdated signal and construction of a new signal leading to improved traffic operations and pedestrian safety in Dedham’s center.
- Effort included post-construction monitoring and adjustment of signal phasing and timing in coordination with Town staff.

King Street and I-495 Ramps Reconstruction – Franklin, MA (MassDOT)

- Performed traffic analysis and optimization of a proposed coordinated system including signalization of the I-495 on- and off-ramps to manage traffic flow from I-495 to a nearby industrial complex.
- Prepared final construction documents, including modifications to all aspects of roadway and traffic design, coordinating with the Town and MassDOT.
- Performed construction phase services, including shop drawing review and contractor RFIs.

Main Street-Segment “A” Improvements – Melrose, MA (MassDOT)

- Prepared traffic signal plans, sign and pavement marking plans, and temporary traffic control plans along with specifications and construction cost estimates for a coordinated traffic signal system along Main Street in Melrose.
- Collected traffic data and conducted traffic signal analysis after construction to measure effectiveness. Optimized timing and coordination settings based on data and traffic observations.

Lebanon Street-Segment “B” Improvements – Melrose, MA (MassDOT)

- Conducted a traffic data collection program and compared data to historical data to determine trends and develop a growth rate to be used for projection of future traffic volumes.
- Designed and prepared plans for two integrated coordinated traffic signal systems comprising six intersections.
- Prepared traffic signal plans, sign and pavement marking plans, and temporary traffic control plans along with specifications and construction cost estimates.

Commonwealth Avenue (Phases 1 and 5), MassDOT/Boston Public Works, Boston, MA

- Served as Lead Traffic Engineer and was responsible for the technical details of the traffic design and traffic management strategies.
- Evaluated traffic and developed plans for traffic signal coordination along the corridor.
- Development of traffic management plans and strategies that maintained traffic flow, parking and transit operations

Main Street Roadway Improvements and Streetscape Enhancement Project – Reading, MA (MassDOT)

- Prepared traffic signal, sign and pavement marking, and traffic management plans for the roadway and streetscape improvement project which included coordination of five closely-spaced intersections in a town common area with high vehicle volume, parking and pedestrian demands.

Eight Locations Intersection Improvements –Greenfield, MA (MassDOT)

- Conducted a data collection program, prepared traffic and accident analyses and report for justification of improvements.
- Prepared plans, specification and construction cost estimate for traffic signal, sign, pavement markings and temporary traffic control improvements and strategies.

Salem Street Roadway Improvements Project –Wakefield, MA (MassDOT)

- Lead Traffic Engineer for design of a coordinated signal system including reconstruction of an existing signal and two new signals along Salem Street.
- Prepared plans, specification and construction cost estimate for traffic signal, sign, pavement markings and traffic management plans.

Traffic Signal Inspections—Various Locations, MA

- Performed final traffic signal inspections for numerous BETA design projects statewide. Included inspection of all signal equipment including controllers, detectors, signal heads, pull boxes, and cabinets. Verified signal phasing and timing and performed fine tuning to reflect actual traffic flows. Prepared punch list of necessary changes for contractor to implement.

Professional Overview

Ms. Carr is a Landscape Architect with 30 years of public sector experience with a focus on urban design, streetscape, park and multi-modal transportation projects. Her expertise includes multi-disciplinary teamwork, project management, public outreach, master planning, state agency permitting, design, bid documents & construction support services.

Design Experience

Washington Pedestrian Bridge - Providence, Rhode Island

The award winning Linear Park that showcases a **bike path, pedestrian walkway and center plaza on the renovated southern span of the historic Washington Bridge is a critical link in the Rhode Island Bike Path System that joins the East Bay Bike Path to Providence.** The rest of the bridge was demolished to make way for a new structure carrying Interstate 195. Ms. Carr provided Project Management of contract drawings and construction support. Highlights are the reuse of granite bastions for seating and planters, stamped concrete paving system, bronze bridge plaques and interpretive panels in a design that draws attention towards the bay and away from the busy highway. Completion 2015.

Relocation of Interstate 195 - Providence, Rhode Island

Relocating the highway that bisected the city center, allowed for the reconnection of city streets and the formation of six acres of development parcels and two waterfront parks. As sub-consultant to CDR Maguire Inc. Engineers on the \$600 million project, Ms. Carr participated in all phases from conceptual design and the Environmental Impact Statement to construction support. **The contracts below have bike path and multi-use systems that are key components connecting the Providence and greater Rhode Island networks:**

- Parks Contracts 16 and 17: Developed riverwall and park concepts on a multidisciplinary team of architects, landscape architects and engineers. Managed production of conceptual plans, PowerPoint presentations for the I-195 Commission/stakeholders, and contract drawings. Current status: 90% design.
- Contract 14 and 15: Developed streetscape concept for new city streets to be reconnected after former highway demolition. Continuation of Providence river walks and parks. Prepared renderings for, and presented at public charrette and interest group meetings. Incorporated Best Management Practices for sidewalk drainage into planter design. Management of construction document submissions. Construction complete 2015.
- Contract 10 & 11: Management of 90% submission through construction. Landscape Architectural site improvements of I-95 right of way service roads, grading and retaining walls including Clifford Street Bridge abutment areas and architectural treatment. Coordination with Engineers on highway and structural plans. Construction complete 2012.

I-95 Whittier Bridge over Merrimack River - Amesbury, Newburyport & Salisbury, Massachusetts

Currently Ms. Carr is providing peer review services for the design/build project. As sub-consultant to Parsons Brinckerhoff, Ms. Carr was responsible for the production of the 25% landscape plans and accompanying RFP for the design/build project. She coordinated the development of **contract wide planting requirements and site improvements for a two mile shared use path including trailheads, parking and sixteen environmental, historic and way-finding interpretive panels.** Public participation included monthly



Primary Discipline

Landscape Architecture

Years of Experience

- BETA: Since 2012
- Total: Since 1985

Education

- Master of Landscape Architecture, University of Virginia (1985)
- Bachelor of Science, Plant and Soil Science, University of Vermont (1981)

Registrations

- Rhode Island Registered Landscape Architect License #187
- Massachusetts Registered Landscape Architect License #4052

Affiliations

- American Society of Landscape Architects (ASLA)
- President Rhode Island Chapter RIASLA, 2016
- Women's Transportation Seminar (WTS)
- East Coast Greenway Alliance (ECGA)

presentations and committee coordination. She also played an advisory role in the architectural treatments of the bridge including the reuse of bridge artifacts. Public participation included monthly presentations and committee coordination. Current status: Construction.

MassDOT, Kenneth F. Burns Memorial Bridge Reconstruction - Worcester & Shrewsbury, Massachusetts

As sub-consultant to Transystems, Ms. Carr is managing the interpretive panel and structure design for eight, eighteen foot long boat shaped panels for the Burns Bridge **pedestrian way and bike path** overlooks and a bronze and granite boat shaped memorial plaque. Work includes coordination with the Shrewsbury and Worcester Historical Societies and Worcester State University. Construction complete 2015.

Lexington Town Center Streetscape - Lexington, Massachusetts

Ms. Carr managed BETA's landscape architectural effort aimed at improving safety, ADA adherence and visual cohesiveness while promoting economic vitality and tourism in this historic town center streetscape. **Bicycle accommodations on Massachusetts Ave and linking to the Minuteman Bike Path were essential.** Public and stakeholder outreach were vital components leading to the design and town approval of the 25% plans. Ms. Carr also prepared conceptual plans for the adjacent historic Battle Green.

Needham Downtown Streetscape - Needham, Massachusetts

Working closely with the Streetscape Committee and stakeholders in monthly sessions throughout one year, Ms. Carr coordinated the design and preliminary landscape architectural plans. The first phase, including the Center's two main intersections and Town Common edge is currently in final design.

Thompson Center Reuse Master Plan – Hyde Park, Massachusetts

As Project Manager for the adaptive reuse of nine acres of defunct park land in the middle of the Department of Conservation and Recreation's (DCR) Stony Brook Preserve, Ms. Carr is coordinating BETA's design effort with the community and DCR in their public- private partnership with the Dog Park Association of Southwest Boston (DPA). Goals are to bring the park back to life while integrating an off-leash park with the multi-use needs of future park users. Tasks include a thorough site assessment, concept and preliminary plans.

ADA Trail – Town of Needham

Project Manager for a one-half mile ADA trail circling the Needham Reservoir. A fully compliant pervious stabilized crushed stone trail system with sections of raised boardwalks, a fishing pier and foot bridge over the spillway are planned along with a rope edging and sensory interpretive elements for users who are visually impaired. New parking will be provided. The design was coordinated with town committees and two public workshops were held to obtain feedback and support.

Olmsted Rockery Charrette - Town of Easton

Facilitated a series of Charrettes and public workshops for the town on the F.L. Olmsted designed Rockery Memorial Cairn. Worked with the Town and community in preparing conceptual plans for improvements to the Rockery area which includes the H.H. Richardson designed Oakes Ames Memorial Hall and the Ames Free Library. Ideas for improving vehicular and pedestrian access and improving the Rockery site were explored. Participated in meetings and presentations with stakeholders and community residents

Red Sox Fenway Park Safety Improvements - Boston, Massachusetts Ms. Carr managed the design and permitting for the installation of safety bollards at Fenway's entrance gates.

Awards (Team Member)

Washington Pedestrian Bridge Providence, Rhode Island

- 2015 Merit Award
American Society of Landscape Architects- Rhode Island Chapter
- 2016 Grand Prize
Scofield Decorative Concrete Award
- 2016 American Public Works Association's Public Works Projects of the Year

I-95 Whittier Bridge Project, Amesbury, Salisbury, Newburyport, Massachusetts

- 2013 Engineering Excellence, Silver Award Winner, American Council of Engineering Companies (ACEC), Massachusetts.

I-195 Relocation Project, Providence, Rhode Island

- 2010 Grand Conceptor Winner (First Place) Engineering Excellence Award, American Council of Engineering Companies (ACEC), Massachusetts & Rhode Island.
- 2010 Engineering Excellence Award Finalist, American Council of Engineering Companies (ACEC) / National

Professional Overview

Amanda Sloan has more than 20 years of experience on a wide variety of projects in landscape architecture including rain gardens, school and playground gardens, parks, recreation sites, low impact development designs, residential landscapes and planting design throughout New England. She assists with community and permitting processes, presentation graphics, and writing, and is certified by the Rhode Island CRMC in Invasive Plant Management. She has served pro bono as a landscape design teacher with Groundwork Providence and The Binah School; her school and rain garden designs often include a student participation component.

Bringing her strong interest in the connections between people and nature to her work, Amanda has developed a specialty in native plants and ecological design. She brings skills in hand rendering, AutoCAD and Photoshop to her designs. Her community projects have lent her experience leading design charrettes and she lectures frequently in local communities about rain garden design.

Amanda served as an elected member of the Sharon, MA Planning Board for five years. She was a founding board member of the Community Design Resource Center of Boston, assisting underserved communities to implement high quality design solutions. She currently serves on the boards of the Ecological Landscape Alliance; Grow Native Massachusetts promoting use of native plants in designed landscapes; and the Friends of Sylvan Gardens on Cape Cod.

Design Experience

Rain Gardens: Historical Society Rain Garden, Sharon, MA; St. Charles Borromeo rain Garden, Woonsocket, RI; Manton Heights Rain Garden & West River Rain Garden, Providence, RI; Chocolate Factory Rain Garden, Central Falls, RI; Americas Cup Rain Garden, Newport, RI; Cape Cod Museum of Natural History Rain Garden, Brewster, MA; and many others.

Parks: Clay Pit Pond Park, Belmont, MA; Lake Massapoag Park & Deborah Sampson Ballfields Park, Sharon, MA; Patriots Park, Newport, RI; Johnson & Wales Urban Coastal Greenway, Providence, RI

Affordable Housing/Urban Design: Olney Village Apartments & Downtown Improvement District, Providence, RI; Barrington Workforce Housing, Barrington, RI

Equestrian Communities/Bike & Walking Trails: Toils End Farm, Wrentham and Norfolk, MA; Whittier Bridge Multi-use Path, Newburyport, MA; Clay Pit Pond Walking Path, Belmont, MA.

Dog Parks: Sharon Dog Park, Sharon, MA

Historic Sites: Weeks Pedestrian Bridge, Cambridge, MA; Aldrich Mansion, Warwick, RI

Children's/School Gardens: The Secret Garden, The Story Garden, Courtyard Science Garden, Rain Garden, Ames St Playground Garden, Outdoor Classroom, Sharon, MA; Weezie's Garden, Wellesley, MA (with JMMDS); Moses Brown School Gardens, Providence, RI

Alzheimer's Gardens: Residential Garden, Sharon, MA; Tockwotton Home, Providence, RI

Residential: Regency Apartments, Providence, RI; Rosedale Landing, Cranston, RI; residences in Maine, Massachusetts, Rhode Island, Connecticut, Florida, Bermuda

Awards

Americas Cup Rain Garden, Newport, RI. Clean Regattas Gold Certification, June 2012.

Manton Heights Rain Garden, Providence, RI. RIASLA Merit Award, Communications, 2011.

Coastal Maine Residence, Southport, ME. RIASLA Merit Award, Design, 2011.

Patriots Park at Touro Synagogue, Newport, RI. Newport in Bloom Awards, 2009, 2010.

Weezie's Garden, Wellesley, MA. Boston Parent's Paper Favorite Outdoor Playspace, 2005.

Lake Massapoag Park, Sharon, MA. Garden Club Federation of MA Presidential Citation, 2004. Massachusetts State Legislature Citation, 2003.

Secret Garden Teaching Space, Sharon, MA. President's Bowl, Garden Club Fed. of MA, 1997.



Primary Discipline

Landscape Architecture

Years of Experience

- BETA: Since 2012
- Total: Since 1993

Education

- B.A. in Science in Society, Wesleyan University - Middletown, CT
- Graduate Certificate in Landscape Design, Landscape Institute - Boston, MA

Registrations

- Registered Landscape Architect, Rhode Island License #470

Affiliations

- American Society of Landscape Architects (ASLA)
- Boston Society of Landscape Architects (BSLA)

Publications

- Illustrations, *Fine Gardening Magazine*, 2004-2006
- "Memorial Park Beach: Lakeside Park Restoration Project," *Ecological Landscaping Association Newsletter*, Feb. 11, 2010
- "Donation of Materials, Passion, and Time = A Beautiful and Functional Rain Garden at a Public Housing Residence," *ELA Newsletter*, July 15, 2011

Michelle Langone Danila, P.E., PTOE

Senior Engineer



Michelle Danila, P.E., PTOE has a civil engineering background that includes transportation planning, traffic analysis, safety analysis, and roadway and intersection design. With a strong safety background, Michelle has an excellent understanding on how to improve safety that she applies to all her projects. She has worked on roadway and intersection design projects throughout the United States and has the ability to take designs from conceptual design through construction. To date, she has designed over 80 miles of bicycle facilities that have been implemented for the City of Boston, including separated bike lanes.

Selected Project Experience

- **Grand Junction and MIT Property Feasibility Study**, Cambridge, MA
Serving as the Project Manager, Michelle worked on the feasibility of a multimodal path on the Massachusetts Institute of Technology's property. The proposed multimodal path would run along an active rail corridor and service roadway. Michelle assisted in determining the design alternatives and potential impacts. In addition, she conducted an existing conditions analysis for the existing cycle track along Vassar Street and prepared recommendations to upgrade the separated bicycle facility to current standards. Michelle worked with the project team to prepare the feasibility study report focusing on the proposed trail connectivity to the larger regional network and the recommended design standards.
- **DCR Parkways Study**
Michelle is serving as the Engineering Lead for the comprehensive study of the Department of Recreation and Conservation's (DCR) parkways. The study will include public outreach, review of DCR's current paving program, field inventory, parkway assessments and recommendations, and the preparation of construction documents for a demonstration project. As the Engineering Lead, Michelle is responsible for the paving program review, the field inventory, the recommendations, and the demonstration project.
- **Improving the Arborway**, Boston, MA
Michelle is the Project Manager for the feasibility study and design development of improving the Arborway in Boston, MA, for pedestrians, bicyclists, and motorists. Working with the Department of Conservation and Recreation (DCR), Michelle conducted existing conditions analysis, held a multiple day design charrette with the public and stakeholders, and prepared starter ideas for improvements. Currently, the recommendations are to replace large rotaries with modern roundabouts, provide raised crosswalks, traffic calming elements, and separated bicycle facilities to connect two existing paths. Toole Design Group (TDG) will be preparing construction documents of the final conceptual design.
- **Boston Vision Zero Planning and On-call Design**, Boston, MA
Michelle is serving as the Project Engineer for Boston's Vision Zero Planning and On-call Design project. Michelle is responsible for developing rapid response engineering design plans that aim to reduce traffic crashes and crash severity.

Professional Highlights

- Toole Design Group: 2009-Present
- Howard/Stein-Hudson Associates: 2000-2009

Education/Certification

- Master of Science, Civil Engineering, University of Massachusetts-Amherst: 2006
- Bachelor of Science, Civil Engineering, Northeastern University: 2004
- Professional Engineer: MA
- Professional Traffic Operations Engineer: 2010

Specialized Training

- Integrating Cycletracks: A Design Charrette for Greener Cities: 2010
- Low-cost Safety Improvements: 2009
- Fundamentals of Highway Safety Series: 2008
- Road Safety Audits/Assessments: 2008
- Signalized Intersection Handbook Workshop: 2006

Appointments/Affiliations

- President, Institute of Transportation Engineers, New England Section: 2014
- Executive Board, ITE Pedestrian and Bicycle Council: 2011-Present
- American Society of Civil Engineers

John Dempsey, RLA

Landscape Architect



John Dempsey is a licensed landscape architect with professional practice in site design and planning, streetscape improvements and non-motorized transportation projects with a multi-disciplinary team. He has direct experience working on wide range of on-street and off-street bicycle facilities, bicycle parking design, collaborative charrette style workshops, feasibility studies, landscape design and safe routes to school projects. John's well-developed knowledge of design principles make him an integral component in the multimodal transportation world.

Selected Project Experience

- **Connect Historic Boston, Boston, MA**
John assisted with conceptual design and planning support for the City of Boston's Connect Historic Boston (CHB) project. He developed conceptual design plans for the recommended infrastructure improvements to connect historic sites with transportation nodes. John is also conducting extensive route evaluation fieldwork documenting a variety of streetscape elements from downtown Boston transportation nodes to historic sites and assisted the team with the development of route concept alternatives.
- **Closing the Gap | Grand Junction Path, Cambridge, MA**
John Dempsey, PLA was the lead urban designer for the feasibility analysis and conceptual design of three physical improvement projects along the Grand Junction Path in Cambridge, MA. The Grand Junction corridor is an existing railroad right-of-way through the City of Cambridge. This study built upon previous Toole Design Group (TDG) work and proposes to connect missing gaps for the current conceptual design. John worked closely with the Friends of the Grand Junction Path, LivableStreets Alliance, City of Cambridge, Cambridge Redevelopment Authority, and MIT to analyze and propose conceptual design recommendations to complete sections of a proposed linear path. He also incorporated site specific amenities to integrate the facility with the surrounding communities.
- **Emerald Necklace: Crosswalk Improvements, Boston, MA**
John assisted the design team with the evaluation of crosswalk improvements and bicycle accommodations at three locations for the State of Massachusetts Department of Conservation and Recreation (DCR). He is worked closely with team members to develop recommendations for improving multimodal safety at three crossings along the Emerald Necklace parkland located in the City of Boston. The project objective was to enhance access and create safer, high quality pedestrian and bicyclist connections to the Back Bay Fens area of the Emerald Necklace parkland while improving the landscape design aesthetic. He established crosswalk recommendations to address key issues identified and developed supporting conceptual design site plans for stakeholder meetings. John also developed landscape plans and details to accompany the 25% design drawing plan set for site design improvements.

Professional Highlights

- Toole Design Group: 2009-Present
- SE Group: 2006-2008
- Camp Dresser & McKee: 2004-2006

Education/Certification

- Bachelor's of Landscape Architecture, SUNY College of Environmental Science and Forestry: 2003
- Registered Landscape Architect in New York State and Massachusetts

Appointments/Affiliations

- American Society of Landscape Architects, Boston Chapter
- Association of Pedestrian and Bicycle Professionals

Jeffrey Ciabotti

Senior Planner



Jeff Ciabotti is a senior planner at Toole Design Group (TDG) with more than 20 years of experience in active transportation. Jeff is an accomplished project manager who has worked for a variety of cities, regional agencies and state-level clients around the U.S. Jeff's background as Vice President for Trail Development at Rails-to-Trails Conservancy gives him in-depth knowledge of the pathway between planning and implementing projects, and has made him a nationally-recognized expert on trail development. Jeff's breadth of expertise extends from large scale regional planning to detailed infrastructure design, allowing him to effectively lead from the initial visioning to the ultimate project prioritization and development. Jeff is currently leading TDG's work on a countywide trails master plan in Maryland, as well as several trail design projects that include extensive public engagement and inter-agency coordination. Jeff's national perspective and on-the-ground project experience have led to a robust track record of successful, completed projects.

Selected Project Experience

- **Eastside Rail Corridor Trail Project Master Planning Project**, King County, WA
This project was the first phase of a master plan project for the 19.2-mile long Eastside Rail Corridor Trail, which focused on preliminary planning and feasibility studies. This complex corridor will also incorporate a major utility line and may support future transit lines. Jeff's role focused on research and consultation on policy, planning, and design issues related to rail-with-trail and utility line interaction and corridor preservation.
- **Capital Crescent Surface Trail Design and Engineering Support**, Bethesda, MD
Jeff was project lead providing design and engineering support related to the Capital Crescent Trail surface trail alternatives through downtown Bethesda. His role was to navigate the myriad of urban developments, high volume traffic and political sensitivities to provide a "gold standard" trail through Bethesda connecting to the new Purple Line Transit Station and future extensions to the Capital Crescent Trail.
- **Bicycle and Pedestrian Technical Assistance for Maryland-National Capital Park and Planning Commission**, Montgomery County, MD
Jeff was project lead working with the Maryland-National Capital Park and Planning Commission (M-NPPC) providing technical assistance for a series of bicycle and pedestrian-related planning tasks. The first task included conducting a peer review of the Preliminary Engineering Concept Plans developed by the Maryland Transit Administration (MTA) for the Capital Crescent Trail and the Silver Spring Green Trail. The second task was to determine the public benefit of a new transit station in Bethesda from a multimodal perspective, including evaluation of pedestrian and bicycle circulation, a new tunnel alignment for the Capital Crescent Trail, and bicycle storage.
- **Frederick East Street Rail-with-Trail**, Frederick, MD
Jeff was co-project lead on this Transportation/Land-Use Connections (TLC) grant from the National Capital Regional Transportation Planning Board. With Jeff's extensive rail trail experience he worked with the city of Frederick to develop 30% plans and technical engineering for this corridor.

Professional Highlights

- Toole Design Group: 2012-Present
- Save the Children - U.S. Programs: 2011-2012
- Rails-to-Trails Conservancy: 1995-2011

Education/Certification

- Bachelor of Arts, Psychology, Rollins College, 1987

Affiliation

- Jeffrey L. Doppelt Charitable Foundation, Trustee
- Transportation Research Board, Pedestrian Committee 2008 – 2012
- Transportation for America, Equity Caucus, 2010 – 2011

Lenore White

WORK HISTORY

OCTOBER 2005 TO PRESENT, WETLAND STRATEGIES, INC.

Ms. Lenore White is the owner and principal of Wetland Strategies, Inc., and offers over 24 years of professional wetlands experience. Since 2005, the biologists at Wetland Strategies have provided expert wetland permitting services to local conservation commissions, site developers, attorneys, and individuals. Wetland Strategies provides expert guidance to their clients on federal, state, and local wetland protection regulations and policies. Wetland restoration and replication plans prepared by Wetland Strategies have been approved by MA DEP and US EPA. In addition to offering wetlands expertise, Wetland Strategies also provides their clients with assistance in obtaining permits pursuant to MA Water Management Act, the MA Endangered Species Program, MA Environmental Policy Act, and the federal 401 and 404 Army Corp of Engineers permits. Ms. White has been qualified to testify as an expert witness on cases at the state and federal levels. Wetland Strategies Inc. is fully insured against professional errors and omissions.

September 2004 to September, 2005 Nover-Armstrong Associates, Inc.

Nover-Armstrong Associates, Inc. (NAA) is a small, women-owned business offering high quality, full service environmental consulting and permitting services. While employed by NAA, Ms. White provided permitting assistance for projects requiring compliance with the MA Wetlands Protection Act including preparing Notice of Intents, site specific reports, and scientific research. In addition she designed and oversaw both inland and coastal wetland replication and restoration projects.

1982 to 2004, Department of Environmental Protection, Environmental Analyst

As a senior wetlands staff member within the Division of Wetlands and Waterways, Ms. White was responsible for the direct supervision of subordinates on inland and coastal wetland issues. She coordinated wetland permit issues with the Department and with local, state and federal agencies. She mediated appeals between the Department and appellants. Ms. White was appointed a member of DEM's River Restore Triage team, reviewing the environmental impacts of dam removal projects.

In 1996 Ms. White was appointed as MA DEP Southeast Region's River Action Team leader. As the leader, she routinely facilitated and presented technical outreach sessions for municipalities and watershed associations on all aspects of the Rivers Protection Act. She supervised subordinate staff members on decisions regarding riverfront protection.

She testified as an expert witness for the Department on various wetland protection issues.

Within the Division of Water Pollution Control, she managed contracts between the state and municipalities for the Clean Lakes Program. She reviewed and wrote technical reports on the relationship between nutrients and water bodies and acted as liaison between the state and public and private interest groups.

Within the Division of Hazardous Waste, she carried out regulatory and enforcement functions.

Lenore White
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Plymouth, MA 02360

Email: lenore@wetlandstrategies.com

QUALIFICATIONS:

Professional Wetland Scientist, National Society of Wetland Scientists
October, 1997. Re-certification issued February, 2013.

Certified Soil Evaluator, Massachusetts Department of Environmental Protection,
1995.

Wetland Strategies is OSD certified as a Women Owned Business and a
Disadvantaged Business.

PUBLICATIONS:

Valutkevich, L.F., McVoy, R., Mallard, P. Whitman's Pond Diagnostic and
Feasibility Study, 1983, Massachusetts Department of Environmental Quality
Engineering, Division of Water Pollution Control, Westboro, Massachusetts.

PROFESSIONAL MEMBERSHIPS:

North and South River Watershed Association Member
Board of Directors - 2008-2011
Southeast Massachusetts Wildlands Trust
Mass. Association of Conservation Commissions
Association of Massachusetts Wetland Scientists

EDUCATION:

Bridgewater State College, 1980
B.S. in Biology, minor in chemistry
Cum laude graduate

Continuing education in wetland science, soil science, and wildlife habitat
evaluations.

Section 3 – Relevant Experience

Introduction

BETA has worked on many projects involving the same opportunities and challenges presented by the Belmont Community path project. The following project descriptions demonstrate that BETA has the experience and ability to successfully complete the project. The references noted can attest to the quality of work and commitment to our clients that BETA ensures for all of our projects.

Completed Feasibility Study:

- Lake Avenue North Linear Park: Worcester, MA - BETA Group, Inc.
- East Side Rail Corridor Trail, Seattle, WA – Toole Design Group

Descriptions for the following projects are appended to this section:

- Fuller Brook Park Preservation: Wellesley, MA
- Rails to Trails Extension: Wakefield and Lynnfield, MA
- Lake Avenue North Linear Park: Worcester, MA
- Connecticut Riverwalk North: Chicopee, MA
- Cochituate Rail Trail Extension: Natick, MA
- ADA Trail Improvements: Needham, MA
- I-195 Relocation Project Shared Use Path: Providence, RI
- Commonwealth Avenue Improvements: Boston, MA

Disclosures

BETA does not have any projects in Massachusetts in the past five (5) years that it has designed, engineered, created bid specifications, proposed a budget and/or otherwise assisted in the development of a project that subsequently required rebidding, was significantly delayed and/or redesigned due to receiving bids higher than the project budget.

Lake Avenue Linear Park – Phase 1 was advertised for construction in June 2013. The Engineer's estimated cost was \$4,193,743. The low bid for the project was \$4,108,656. The City of Worcester subsequently chose not to award a contract for reasons other than the bid amount.



EASTSIDE RAIL CORRIDOR REGIONAL TRAIL **DRAFT MASTER PLAN AND ENVIRONMENTAL IMPACT STATEMENT**

KING COUNTY PARKS AND RECREATION DIVISION
FEBRUARY 2016



Dear Friends:

In our rapidly developing region, we are fortunate to be able to preserve the Eastside Rail Corridor (ERC) in public ownership from Renton to Snohomish. The regional vision for the ERC is to develop a multi-use corridor that enhances mobility and connectivity, supports utility infrastructure needs, and provides recreational opportunities. Within this broader vision, the ERC offers a unique opportunity to create a nonmotorized (regional trail) connection between many vibrant, growing, and dynamic areas, providing a safe and enjoyable recreational experience for people of all ages and abilities and promoting healthy, livable communities. One day, it's possible this corridor may connect from Vancouver WA to Vancouver BC.



The intent is to develop a regional trail in the 15.6 miles of ERC under its ownership and the 1.1 miles of ERC owned by Sound Transit in which the County holds a trail easement that does not preclude future transit or utility use of the ERC, while meeting the following objectives:

- Connect Eastside communities by linking to:
 - Existing and planned regional and local trails
 - Transit centers, park and rides, and East Link light rail stations
 - Residential, commercial, and business centers
- Provide nonmotorized active transportation options and expand recreational opportunities to:
 - Benefit public health
 - Improve air quality and reduce greenhouse gas emissions
 - Expand access for underserved areas of King County
- Incorporate Eastside heritage and culture
- Support opportunities for economic development

This Master Plan and Environmental Impact Statement (EIS) is an important first step towards planning, environmental review, design, and construction of a regional trail in the corridor. The Master Plan and EIS describes options for the character and location of a trail in the ERC with on- and off-railbed alignments. The trail location can vary in places and doesn't need to be the same throughout the entire corridor.

The Master Plan and EIS also address potential impacts associated with trail development and mitigation. Key issues for decision makers include how additional future uses of the corridor, transit, and utilities could affect the trail, as well as the cost to develop the trail.

Many agencies and the community have participated in the stakeholder and public process for the master planning effort, offering ideas and suggestions about the development of the regional trail. The Master Plan and EIS reflects that input and enables the continuation of the conversation. Comments on this document should be submitted by March 31, 2016, to Erica Jacobs at ERCtrail@kingcounty.gov or sent via mail to 201 S. Jackson Street, Suite 700, Seattle, WA 98104.

With your continued support and participation, King County looks forward to realizing the remarkable potential of the ERC.

Sincerely,

A handwritten signature in black ink that reads "Dow Constantine".

Dow Constantine
King County Executive

ACKNOWLEDGMENTS



King County Department of Natural Resources and Parks King County Council

King County thanks the following partners for their contributions to this Master Plan and to the broader vision for developing the Eastside Rail Corridor.

COLLABORATING PARTNER AGENCIES AND REGIONAL ADVISORY COUNCIL MEMBERS



NON-GOVERNMENT ORGANIZATIONS



CONSULTANTS



EASTSIDE RAIL CORRIDOR REGIONAL TRAIL DRAFT MASTER PLAN AND ENVIRONMENTAL IMPACT STATEMENT

KING COUNTY PARKS AND RECREATION DIVISION
FEBRUARY 2016

SUMMARY

King County proposes to develop a regional trail to accommodate nonmotorized transportation and recreation in the railbanked portion of the Eastside Rail Corridor (ERC). In its entirety, the ERC is a 42-mile rail corridor, part of the Woodinville Subdivision, which passes through Renton, Bellevue, Kirkland, Woodinville, Redmond, and portions of unincorporated King and Snohomish counties (Figure S-1). King County intends to develop a trail in the approximately 15.6 miles of the ERC under its ownership and the 1.1 miles of ERC owned by Sound Transit in which the County holds a trail easement. This approximately 16.7 miles of the railbanked portion of the ERC is the focus of the Draft Master Plan and Environmental Impact Statement.

The intent is to develop a regional trail that does not preclude future transit or utilities in the railbanked portion of the ERC. The objectives of the ERC trail are to connect Eastside communities to other regional trails, local trails, transit, and residential, commercial, and business centers; to provide nonmotorized active transportation options and recreational opportunities that expand access for underserved areas of King County, support opportunities for economic development, benefit public health, and improve air quality; and to incorporate Eastside heritage and culture. To realize these objectives, King County has engaged with and will continue to engage with stakeholders and the broader community.

A regional trail, also known as a shared use path, facilitates recreation and regional mobility, accommodates a variety of activities such as walking, running, bicycling, and rollerblading, and anticipates higher user volumes than local trails or paths would typically support. Based on the type and volume of trail use expected, the trail is envisioned as 12 to 14 feet of pavement with a 6-foot gravel shoulder on one side and a 2-foot gravel shoulder on the other. The ERC right-of-way ranges from a minimum of approximately 25 feet wide to 100 feet. To

accommodate the trail width, the Master Plan defines a planning envelope, typically 30 to 40 feet wide, where the trail could be located within the ERC. Other trail design elements described in the Master Plan include intersection treatments, retaining walls, bridges and boardwalks, fencing and barriers, signage, lighting features, landscape elements, and public art.

King County, in coordination with project stakeholders, intends the ERC trail to provide an exceptional trail experience, and expects the trail to be a preferred recreational and commuting facility for users throughout the region. To achieve this, the trail would be designed to a high standard of quality and performance, be sensitively designed to fit the landscape and context, and provide connections to the surrounding region. The ERC is set in a diverse and dynamic area, passing through communities, neighborhoods, and landscapes with distinctly different characteristics. For master planning and descriptive purposes, the 16.7 miles are described in three segments. The Lakefront Segment, between Renton and I-90, passes through mostly residential neighborhoods with topography at times sloping steeply toward Lake Washington to the west. The Wilburton Segment, between I-90 and Kirkland, passes through a more mixed land use and includes the 1.1-mile portion of the corridor owned by Sound Transit where light rail is being constructed, and an area in which the City of Bellevue is planning redevelopment. The Valley Segment includes the ERC Main Line from Totem Lake to Woodinville as well as the Spur from Woodinville to Redmond. The Main Line portion of the Valley Segment begins in a commercial and light industrial area near Totem Lake but soon enters a forested, often steep hillside area. By comparison, the Spur portion traverses relatively flat terrain in the Sammamish River Valley, transitioning from an industrial/warehouse area to mainly agricultural land to the south.



FIGURE S-1. EASTSIDE RAIL CORRIDOR OWNERSHIP

In addition to a No Action Alternative, this Master Plan and Environmental Impact Statement generally describes two alternative trail alignments. An On-Railbed Alternative would align the trail along the existing railbed, taking advantage of the relatively flat area created for rail use typically near the center of the ERC. An Off-Railbed Alternative would primarily align the trail along the edge of the ERC to provide flexibility in accommodating other future uses within the corridor. However, there are portions of the ERC where only one trail alignment is feasible, and this Master Plan calls those out as well.

To compare each alternative, potential consequences are considered to historic and cultural resources, geology and soils, hazardous materials and contamination, consistency with local planning, consistency with potential future uses, transportation facilities, parking and access, consistency with stormwater regulations, trails and parks, ecological resources, surrounding communities, and utilities. For many of these elements, the differences between the two alternative alignments are minor, based on planning-level information. Public engagement found concerns over perceived loss of privacy for some areas adjacent to the ERC. Regardless of the alternative selected, all significant adverse impacts can be avoided, minimized, or mitigated.

Table S-1 summarizes key impacts of and mitigation for the alternatives.

Upon review of the Draft Master Plan and comments received, the EIS will be finalized (including responses to comments), and the King County Executive will select a preferred alternative and present a Final Master Plan to the King County Council for adoption. The preferred alternative could include portions of both the On-Railbed and Off-Railbed alternatives in a given segment of the ERC.

The Draft Master Plan and Environmental Impact Statement are seen as the first step in a phased environmental review. After adoption of the Final Master Plan, it is anticipated that the trail would be developed, as funding allows, in smaller segments with further environmental review, design, and permitting. These smaller segments are not necessarily the same as the Lakefront, Wilburton, and Valley segments.

Considerations affecting the potential sequence or phasing of trail development include, but are not limited to, opportunities for developing interim improvements such as gravel surfacing, coordinating trail development with the timing and proximity of other projects in the corridor and immediate vicinity, taking advantage of proximity to existing nonmotorized facilities, and the availability of funding

TABLE S-1. Key Impacts of the Trail Alternatives

Alternative	General Impact	General Mitigation
On-Railbed Alternative	Other future transit and utility uses may have to be located to the sides, or the trail may have to be relocated.	Relationship between uses would be negotiated based on mechanisms in the easements and agreements between the owners
Off-Railbed Alternative	More extensive earthwork, retaining walls, vegetation and tree removal, and construction cost; generally closer to adjacent uses.	Locate trail on the edge of the ERC with fewest impacts; replant vegetation and trees, where practical and consistent with King County policies
Both Build Alternatives	Traverse wetlands, streams, and associated buffers.	During design, refine the alignment to minimize impacts; contemplate boardwalk over high-quality wetlands; analyze intersecting streams in more detail, and provide fish-passable culverts or bridges in compliance with applicable laws and regulations

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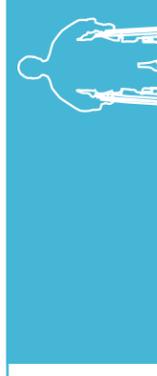


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PRELIMINARY PLANS FOR BUILD ALTERNATIVES

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Ecosystem Evaluation of Alternatives
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Ecosystem Resources Inventory
Corridor Right-of-Way Constraints
At-Grade Intersection Inventory
Historic and Cultural Resources
Geological Conditions Inventory
Community Meetings and Public Open Houses-Comments and Summary

CHAPTER 1



EASTSIDE RAIL CORRIDOR REGIONAL TRAIL MASTER PLAN

“Our Puget Sound region is blessed with dramatic topography, majestic natural features, and large, picturesque water bodies. While adding immensely to the beauty and quality of life in our region, those same features also create challenges when developing transportation, recreation and utility connections. The Eastside Rail Corridor (ERC) provides a rare and unique chance to develop a major north-south corridor for a variety of important purposes: mobility, utility infrastructure, and recreation.”

- Excerpt from the Eastside Rail Corridor Regional Advisory Council report



1.0 INTRODUCTION

The Eastside Rail Corridor (ERC) connects some of King County's largest and fastest growing communities. In its entirety, the ERC is a 42-mile rail corridor that stretches from Renton to Snohomish, passing through Renton, Bellevue, Kirkland, Woodinville, Redmond, and portions of unincorporated King and Snohomish counties. Originally, the rail line was known as the Lake Washington Belt Line and supported development along the eastern shore of Lake Washington. After over 100 years in

service for freight rail, the corridor has been brought into public ownership to provide a potential route for trail, transit, and utilities.

Currently, the corridor south of Woodinville is owned by a combination of public agencies and a private utility. Together, through their partnership in a Regional Advisory Council (RAC), these corridor owners have developed a collaborative vision for the ERC as a location for infrastructure to support continued development of Eastside communities.

Potential uses envisioned for the ERC include a nonmotorized trail, transit, and utilities. This document, the Draft ERC Regional Trail Master Plan and Environmental Impact Statement (Master Plan), describes options for developing a nonmotorized, regional trail (also known as a shared use path) in approximately 16.7 miles of the corridor without precluding potential future use for transit and utilities. While the trail is being planned in the context of potential future transit or utility uses, these would be considered in separate planning processes by the proponent agencies.

The Master Plan is the first step towards planning, environmental review, design, and construction of a nonmotorized regional trail in the corridor.

The Master Plan describes options for the character and location of a trail in the ERC, and discusses the range of benefits and concerns associated with different approaches to building a trail in the corridor.

The ERC trail would connect commercial districts, residential neighborhoods, employment centers, and transit hubs. The ERC trail would also link several significant regional trails that are currently not connected. Individual trails like the I-90/Mountains to Sound Greenway Trail, SR 520 Trail, Cross Kirkland Corridor, Sammamish River Trail, and others would be connected as an integrated trail network.

When complete, the ERC would likely be the most heavily used trail corridor on the Eastside. With a design similar to the Sammamish River Trail or Burke-Gilman Trail, the ERC trail would connect the Eastside's largest communities and employment centers. The trail would become part of the everyday experience for thousands of King County residents for commute trips, trips from home to school, and recreation.

1.1 PLANNING FOR A TRAIL IN THE EASTSIDE RAIL CORRIDOR

What is a regional trail?

King County is home to some of the nation's most celebrated shared use paths.

Regional trails are classified as "shared use paths" by the Federal Highway Administration and are a component of the Central Puget Sound's regional transportation plan, Transportation 2040, administered by the Puget Sound Regional Council. The regional trails network in King County is also being developed as part of the Regional Bicycle Network and Active Transportation Plan. Facilitating both recreation and regional mobility, regional trails are designed to safely accommodate nonmotorized activities such as walking, jogging, bicycling, rollerblading, and other active uses. Regional trails anticipate higher user volumes and a wider variety of activities than local trails or paths would typically accommodate.

Regional trails are typically built to high development standards with limited grades and wide trail cross-sections with a combination of smooth paved surfaces and soft surfaces to accommodate different users and to reduce user conflicts.

King County Parks prepared this Master Plan as an initial step in developing a new regional trail in a portion of the ERC. Once completed, the trail would provide improved connections among other local and regional trails and parks. In addition to recreational opportunities, the trail would provide a nonmotorized or "active" transportation option for commuters connecting to surrounding neighborhoods, employment centers, and commercial areas.

The purchase of the ERC was an investment in the future of the Eastside communities. Following over 100 years of railroad use, new uses in the corridor would meet the needs of a changing region. The ERC has played an important role in the development of Eastside communities. Historically, it carried people and goods between communities and provided a connected corridor for infrastructure. Although the railroad is no longer active in most of the railbanked portion of the corridor, the ERC can continue to play a critical role supporting community development.

In its entirety, the ERC includes approximately 42 miles of right-of-way. This Master Plan includes the railbanked sections of the ERC Main Line between Renton and Kirkland, between Kirkland and Woodinville, and along the Spur from Woodinville to Redmond. Throughout the Master Plan, the line between Renton and Woodinville is referred to as the "Main Line," and the line connecting Woodinville and Redmond is referred to as the "Spur". King County is also responsible for master planning a trail in the 1.1-mile section of the corridor owned by Sound Transit in Bellevue. In total, this Master Plan is focused on approximately 16.7 miles of the 42-mile corridor. King County owns approximately 15.6 miles of the corridor covered in the Master Plan, and Sound Transit owns a 1.1-mile segment located within the City of Bellevue.

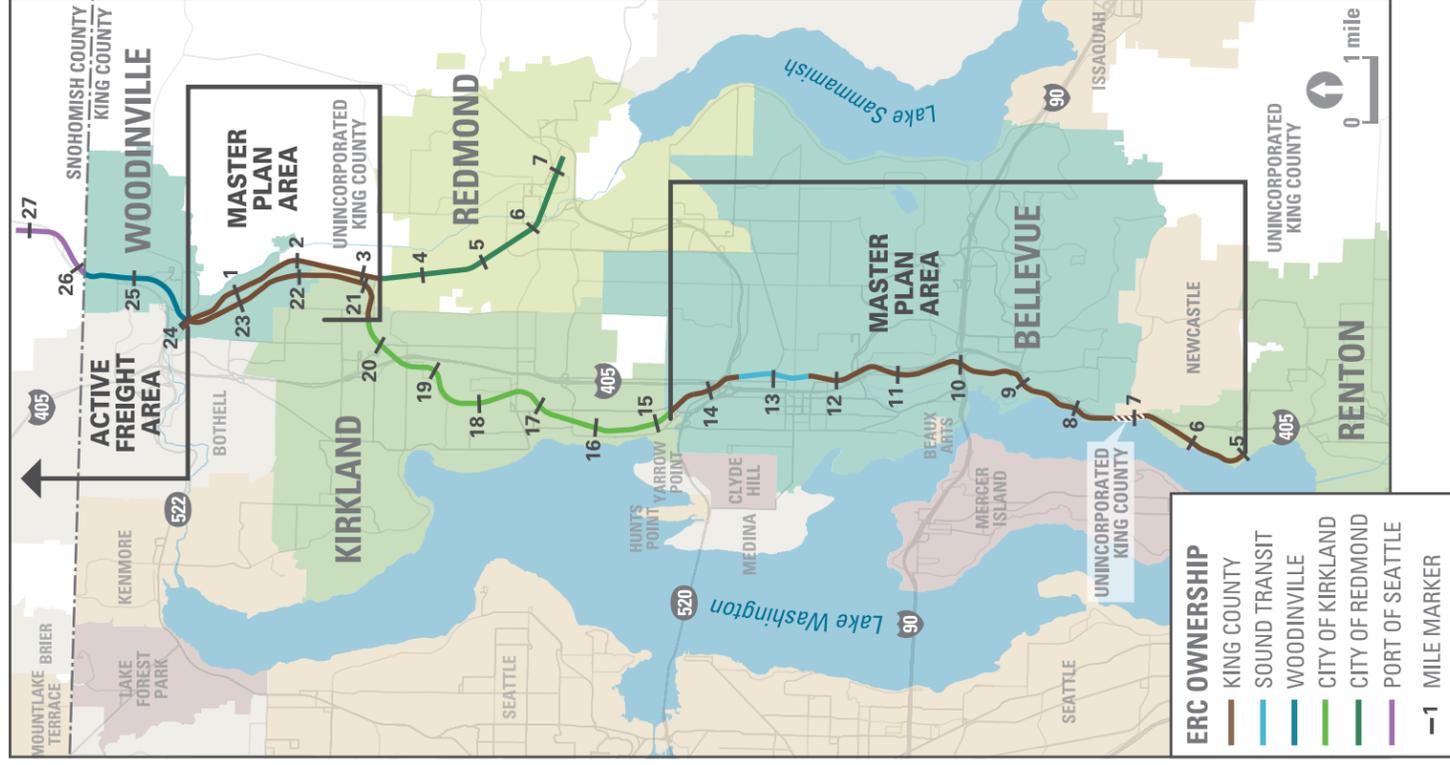
The Cities of Kirkland and Redmond have completed their planning for a trail in their respective ownership areas of the corridor. In the future, through coordination and partnerships with the City of Woodinville, City of Snohomish, and Snohomish

County, the ERC trail may continue from Woodinville north through Snohomish County where it would connect with the Centennial Trail in the City of Snohomish. See Figure 1-1 for an understanding of the ERC ownership and area considered in the Master Plan.

Through partnerships and coordination with transit agencies, the trail would form connections to the regional transit system, expanding multimodal options for commuters throughout the region. As a nonmotorized transportation option, the trail supports multimodal transportation choices, connects with high-capacity transit, and is already at the heart of new development that would, like Google's campus on the Cross Kirkland Corridor, orient itself toward this vibrant public multimodal transportation and recreational corridor.

The planned ERC trail would become part of King County's Regional Trails System. Currently, the Regional Trails System has over 175 miles of trails for bicycling, hiking, and walking that extend from Auburn to Bothell and Seattle to the Cascades. The ERC trail would not only expand the Regional Trails System, but would also serve as a north-south spine to an unprecedented interconnected network of regional and local trails, providing opportunities to connect between Seattle and the Eastside and from south King County communities all the way north to Woodinville, passing through urban growth centers all along the Eastside.





A TRAIL IN A COMPLEX CORRIDOR

By the early 2000s, demand for rail service along the ERC was in decline. Fewer and fewer businesses relied on bulk freight shipping, and there was a continuing shift from manufacturing to services in the communities served by the rail corridor. In 2003, Burlington Northern Santa Fe Railway (BNSF) announced its intent to divest itself of the corridor. BNSF sought interest from local and regional jurisdictions for preservation of the rail corridor in public ownership for public use, rather than having it sold off in pieces and losing a rare and irreplaceable asset of a continuous linear corridor through the rapidly growing Eastside.

In 2009, a group of regional partners, including King County, signed a Memorandum of Understanding that envisioned a regional approach to preserve the corridor for multiple uses. The Port of Seattle acquired ownership of the corridor between Renton and Snohomish. The portion of the corridor between Renton (approximately milepost 5.0) and Woodinville (milepost 23.8) and the Spur between Woodinville and Redmond were railbanked in fall 2008 while negotiations among BNSF, King County, and the Port of Seattle were ongoing. King County then became the interim trail sponsor of the railbanked portion. South of approximately milepost 5.0 and northeast of milepost 23.8, the ERC remains an active rail corridor.

Following railbanking and acquisition, the Port of Seattle sold its interests in the corridor to the current owners:

- The City of Redmond purchased ownership of the Spur within its boundaries in June 2010.
- Puget Sound Energy (PSE) purchased a utility easement along the entire corridor (except within the Redmond-owned portion) in December 2010.
- The Central Puget Sound Regional Transit Authority (Sound Transit) purchased ownership of 1.1 miles of the corridor in Bellevue for its East Link light rail. Sound Transit also purchased and hold an easement for high-capacity transit in the entire railbanked area.
- Also in April 2012, the City of Kirkland purchased ownership of 5.75 miles of the corridor within its boundaries.
- In February 2013, King County purchased ownership of the remaining approximately 15.6 miles of the railbanked area between Renton and the Woodinville “weye,” and the Spur between the Woodinville “weye” and Redmond. In connection with the initial railbanking and acquisition, King County earlier purchased a multi-purpose easement in the railbanked area, which it still holds in the areas owned by Kirkland, Sound Transit, and the Port of Seattle.

What is railbanking?

Railbanking is the legal process of preserving inactive railroad right-of-way for potential rail re-use in the future. The railbanking process was established in 1983 as part of the National Trail Systems Act.

When a corridor is rail-banked, the railroad is allowed to remove all of its equipment, except bridges, tunnels, and culverts, and to turn the corridor over to any qualified entity to maintain it for future trail use (the “interim trail sponsor”).

For railbanking, an “interim use” trail is any trail developed in the corridor during the time that there is no active railroad use.

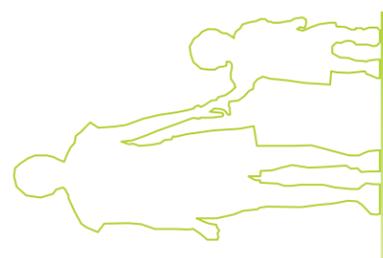


FIGURE 1-1. EASTSIDE RAIL CORRIDOR OWNERSHIP

Figure 1-2 depicts the various ownerships and easements held in the corridor. This Master Plan does not address any portion of the ERC south of approximately milepost 5.0, northeast of milepost 23.8, where rail is active, or the portions of the ERC owned by Kirkland or Redmond. The easements and agreements in place between the various owners establish the nature and relationship among the different uses in the railbanked portion of the ERC.

The ERC provides an opportunity to establish a major regional trail spine on the east side of Lake Washington between Renton and Woodinville. Similar to thousands of miles of other disused railway corridors across the country that have been railbanked under the National Trails System Act (Rails to Trails), the historic freight rail line—with continuous linear right-of-way, established bridges and tunnels across topographical, and engineered barriers—makes the ERC an ideal candidate for an invaluable regional public trail where none exists today.

This Master Plan is focused on the development of a regional trail in the sections of the ERC owned by King County and Sound Transit (approximately 16.7 miles.) A large group of Eastside jurisdictions and public agencies have interests in the future development of the ERC. These include both the jurisdictions and agencies with ownership interests in the railbanked portion of the corridor, and the underlying Cities of Renton, Bellevue, and Woodinville, which have regulatory and land use authorities and responsibilities that have significant bearing on the use and development of the corridor where it passes through their boundaries. The different ownership interests in the corridor and the multiple jurisdictions through which the corridor passes add complexity to the plan for a trail.

As a strategy for promoting a coordinated vision for the corridor, the five owners of the railbanked portion of the ERC (King County, Sound Transit, City of Redmond, City of Kirkland, and PSE) formed a RAC in 2013, and developed recommendations for a multi-purpose corridor in a report titled Creating Connections (King County et al. 2013). This initial planning done by the RAC supports implementation of projects including the Redmond Central Connector, Cross Kirkland Corridor Interim Trail, Sound Transit's East Link Light Rail Project, and King County's process to develop this Master Plan. Each of the ERC owners has completed some work towards planning for their ownership in the corridor. These efforts and the planning goals for the underlying jurisdictions in the corridor create the context for the Master Plan.

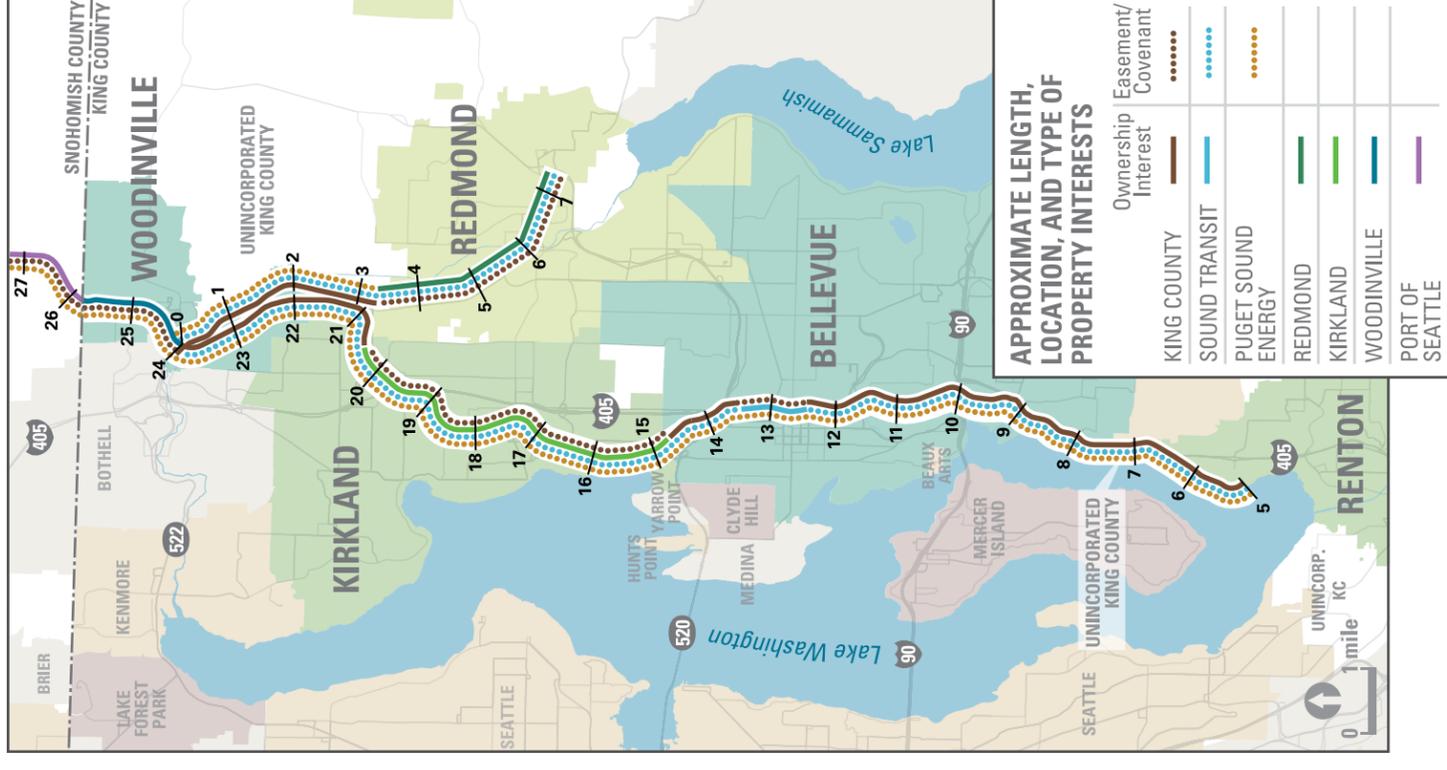
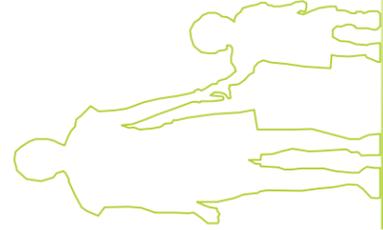


FIGURE 1-2. EASTSIDE RAIL CORRIDOR INTERESTS AND EASEMENTS

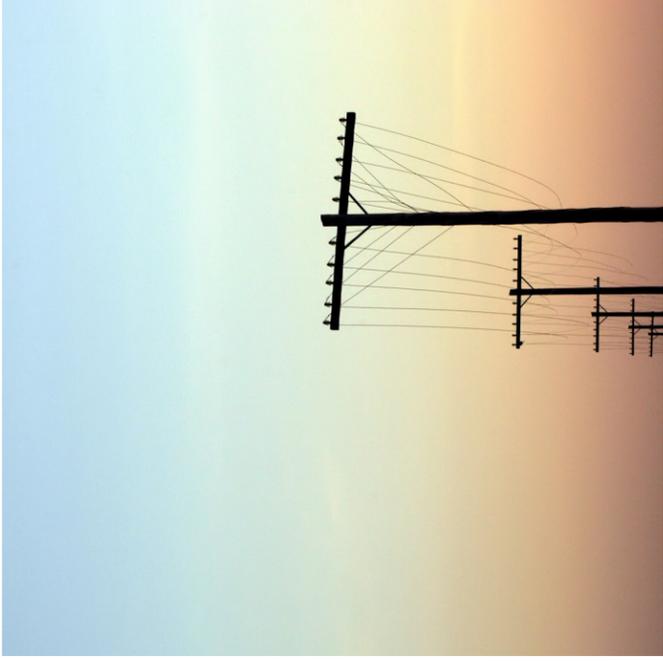




SOUND TRANSIT

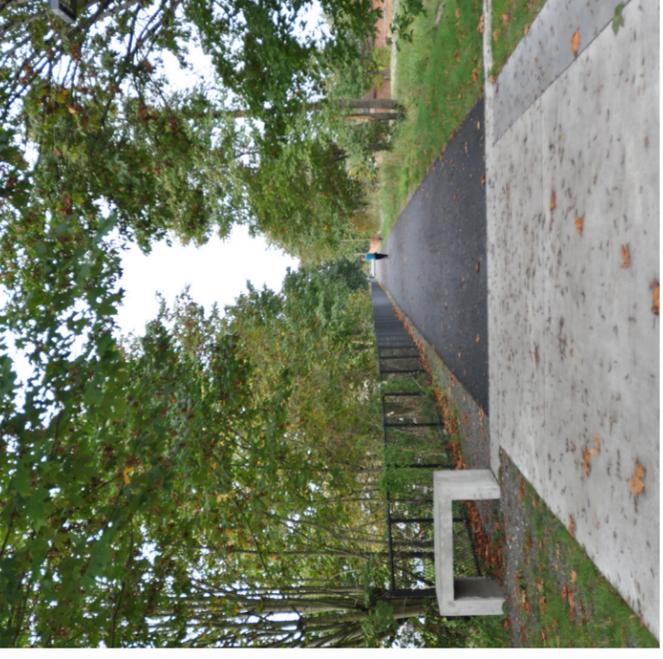
Sound Transit has been advancing the development of a portion of its East Link light rail, Wilburton Station, and Operations and Maintenance Satellite Facility, all of which would occur within the 1.1-mile portion of the ERC owned by Sound Transit in Bellevue.

In addition, Sound Transit has been assessing the long-term needs of the region for high-capacity transit. These assessments have included a look at portions of the ERC for which Sound Transit holds an easement (Sound Transit 2014). Along with Sound Transit's update to its Long-Range Plan, transit in this corridor would be considered by the Sound Transit Board of Directors in its planning of system expansion measures—Sound Transit 3 (ST3)—that could go before voters for approval as early as summer or fall 2016.



PUGET SOUND ENERGY

The demand for electricity and other utilities in King County is expected to grow. The Puget Sound Regional Council (PSRC) VISION 2040 estimates an additional 1.3 million people and 1.0 million jobs will be added in the region between 2010 and 2040. PSE is currently designing the Sammamish–Juanita 115-kV transmission line project, which proposes to locate transmission poles in the ERC corridor east of Totem Lake. As part of this project, PSE is also considering transmission poles along the Spur. The ERC is also a potential site for high-voltage power lines proposed under the Energize Eastside project. The final strategy for Energize Eastside, potentially including the location for new transmission lines, will be completed in 2017 or 2018.



CITY OF REDMOND

In 2010 to 2011, the City of Redmond developed a master plan for the 3.9-mile portion of the Spur within its city limits, called the Redmond Central Connector. Redmond constructed a 1-mile segment in 2013 that extended from the Bear Creek Trail near SR 202 and Redmond Way to the Sammamish River Trail. A 1.3 mile extension of the Redmond Central Connector from east of the Sammamish River Trail to the 9900 block along Willows Road, near the south end of the Willows Run golf complex, is anticipated to be constructed in 2016. The remaining 1.6 miles of trail that would extend this route to Kirkland and Woodinville across NE 124th Street are yet to be funded (City of Redmond 2015).



CITY OF KIRKLAND

In June 2014 the City of Kirkland adopted a master plan for the 5.75-mile ERC section within its ownership, named the Cross Kirkland Corridor (City of Kirkland 2014). The City's master plan was developed with the understanding that multiple uses, such as high-capacity transit and utilities, may be implemented in the future. The Cross Kirkland Corridor has been the focus of interim trail development and was opened in January 2015.

1.2 THE VISION

MULTI-USE VISION FOR THE ERC

The vision for the railbanked portion of the ERC established collaboratively by the RAC is to develop a multi-use corridor that enhances regional mobility and connectivity, supports utility infrastructure needs, and provides recreational opportunities.

The initial RAC planning efforts emphasized the long-term value of the ERC for development of a trail, transit, and utilities. The RAC report describes the potential long-term opportunity to accommodate multiple uses in the corridor, potentially including transit, power transmission, and underground utilities in addition to a trail. Although this Master Plan is only focused on developing a trail in the corridor, it is intended to preserve flexibility for potential transit and utility uses being located within the ERC in the future.

VISION FOR THE TRAIL

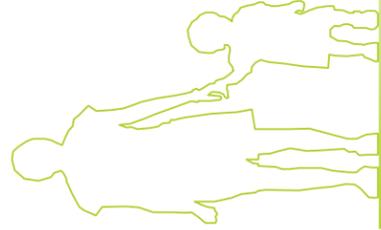
The vision for the trail in the ERC is to create an exceptional trail that provides a safe and enjoyable experience for people of all ages and abilities within the context of the broader vision for the corridor. The trail would link vibrant Eastside communities with natural areas, landmarks such as the Wilburton Trestle, unique experiences, and views. Over time communities would embrace the trail, creating an engaging trailside environment and integrating the trail into the evolving land use plans for areas neighboring the trail corridor.

“This trail system is a gem that will provide healthy recreation for our communities for years to come.”

- Bellevue Open House, Fall 2015

“This trail will become a feature that defines the Eastside, much as the Space Needle defines Seattle.”

- Online Comment, Fall 2015



1.3 OBJECTIVES

The King County- and Sound Transit-owned sections of the ERC include over 16 miles of potential new regional trail, and pass through an exceptionally diverse setting. It is likely that the trail would be developed in phases, and different local jurisdictions and public agencies would be involved in implementing the Master Plan and its envisioned connections.

King County intends to develop a regional trail that would be a high-quality facility for safely accommodating a wide range of users. The trail would be both a nonmotorized transportation option for commuters and a recreation option for residents. The trail would be built to high development standards, including limited grades, with wide, smooth, paved trail surfaces to accommodate a wide range and high volume of users. It would also be developed to preserve flexibility for potential future transit and utility use in the ERC, and to accommodate potential future reactivation of freight rail in the corridor consistent with railbanking.

The objectives of the Draft Master Plan are to guide development of a regional trail in the ERC that:

- Connects Eastside communities by linking to:
 - Existing and planned regional trails
 - Existing and planned local trails
 - Transit
 - Residential, commercial, and business and employment centers
- Provides nonmotorized active transportation options and expands recreational opportunities to:
 - Expand access for underserved areas of King County
 - Support opportunities for economic development
 - Benefit public health
 - Improve air quality
- Incorporates Eastside heritage and culture

These objectives for the trail would guide consistent implementation of the plan. They also specify the outcomes the Master Plan is intended to achieve, the trail experience that is envisioned for future users, and the benefits the trail is expected to provide to trail users and local communities. Several important objectives of the Master Plan align with King County priority strategic objectives, including regional mobility, equity and social justice, and confronting climate change.

IMPROVE REGIONAL MOBILITY – CONNECT EASTSIDE COMMUNITIES

Regional Trails

The ERC provides an opportunity to connect existing regional trails throughout Eastside communities, establishing a continuous network of public nonmotorized recreation and active transportation facilities in the region. This network would serve an aggregate population of over 350,000 citizens within the Eastside alone, and well over 1 million when considering users who could access the ERC from its connections to communities west of Lake Washington.

The ERC trail would present recreation opportunities and provide transportation options. The Eastside is served by some of the region’s best trails—the Sammamish River Trail, I-90/Mountains to Sound Greenway Trail, Cedar River Trail, and SR 520 Trail—that connect pieces of the region. Trails are an important component in the transportation system for people who commute by nonmotorized transportation options such as walking, running, or bicycling. The ERC would bring all of these trails together into a connected network, increasing both nonmotorized transportation options and recreation opportunities on the Eastside.

Local Trails

The ERC also provides the potential to connect several local trails with the corridor. Local trails that serve the Eastside community include the May Creek Trail, Coal Creek Natural Area Trails, Mercer Slough Nature Park Trails, and Wilburton Hill Park Trails. Connecting local trails to the Regional Trails System would further enhance the network and increase community access to recreation opportunities and transportation options.

Transit

Jurisdictions across the region are working to integrate transit and other multimodal transportation options. The ability to walk or bicycle to transit stops is an integral part of accessing transit. Approximately 93 percent of transit riders in King County walk or

bicycle to transit (King County 2015a, 2015b); connected, high-quality nonmotorized facilities enhance people's ability to access transit. The ERC presents an important opportunity for making transit connections.

Residential, Commercial, and Business Centers

The ERC passes through (or runs very close to) core business districts of Renton, Bellevue, Kirkland, Woodinville, and Redmond. Residential areas are located near the ERC through Renton and south Bellevue, and also in north Kirkland and Woodinville. It would be an effective connector for most of the Eastside's largest communities.

PROVIDE NONMOTORIZED TRANSPORTATION OPTIONS AND RECREATIONAL OPPORTUNITIES

The ERC is within an approximate half-mile distance of 13 parks and 22 schools along the route and passes through local retail districts and residential areas. The ERC trail would provide a walking route for many neighborhoods that currently lack pedestrian facilities, encouraging healthy active recreation and transportation choices for local trips.

Expand Access for Underserved Areas (Equity and Social Justice)

Neighborhoods near the southern terminus of the ERC have a more diverse population and a greater percentage of lower income households compared to neighborhoods along the rest of the ERC. King County has defined equity and social justice to mean a "fair distribution of public goods, institutional resources and life opportunities for all people." A new regional trail in the ERC would provide opportunity for commuters and recreational users near the southern terminus to tie into other regional trails. The ERC trail would improve the active transportation connections between affordable housing in the southern portion of the corridor and job centers in east King County. Local trail connections are also envisioned for adjacent transit stops and

park-and-ride facilities, benefiting individuals that rely on a combination of transit, cycling, or walking.

Support Opportunities for Economic Development

A regional trail on the ERC would improve nonmotorized access to and between adjacent or nearby communities, employment centers, and retail hubs. The ERC's southern terminus is near Gene Coulon Park with envisioned extensions to and through The Landing in Renton. The corridor would support access north through the Wilburton neighborhood, medical center, and Spring District in Bellevue. In Kirkland, the ERC passes through the developing Google campus, and connects to the growing Totem Lake neighborhood. The corridor then continues through the growing winery and tourism district in Woodinville. The Spur also connects to Redmond's town center, a centerpiece of the city's mixed-use downtown redevelopment. A regional trail would enable neighboring communities to encourage economic development in proximity to the commercial centers along the ERC. Increased mobility would support economic growth and could become a regional asset that helps attract new residents and businesses to the corridor. Regional trails generate economic benefits for communities they serve, including documented direct spending by trail users. The ERC could be an exceptional amenity for some of the region's most exciting, newly developing mixed-use neighborhoods.

Benefit Public Health

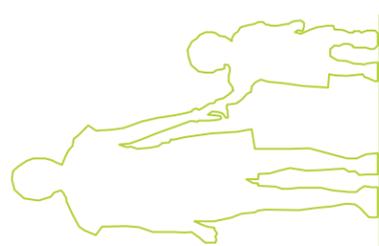
A regional trail in the ERC would provide opportunities for physical activity such as walking, running, and cycling, which would have public health benefits. King County has a goal to raise the activity levels of King County residents who are currently sedentary and decrease their risk for chronic disease. In 2013, approximately 78 percent of adults (18 years of age and older) did not meet physical activity requirements (King County 2014). Connecting the ERC to other regional and local trails would link more communities to the trail network and provide residents with options for exercise and recreation.

Improve Air Quality and Reduce Greenhouse Gas Emissions

The development of the ERC into an active nonmotorized transportation route provides an opportunity for King County to make progress toward its goal of reducing greenhouse gas (GHG) emissions by 80 percent by 2050 (as compared to a 2007 baseline) (King County 2015c). King County works to protect the health of communities by improving air quality. Air pollution can have health impacts while GHG emissions contribute to climate change. King County is designated as a maintenance area for both ozone and carbon monoxide by the Washington State Department of Ecology (Ecology 2015). While the air quality is generally good, the Puget Sound Clean Air Agency indicated unhealthy air quality levels were reached in 2013 and 2014 (PSCAA 2015).

Motorized transportation is the predominant contributor of GHG emissions in King County. The County adopted a Strategic Climate Action Plan in 2015 and has committed to "reduce countywide sources of GHG emissions, compared to a 2007 baseline, by 25 percent by 2020, 50 percent by 2030, and 80 percent by 2050." Providing an opportunity for walking, running, and cycling on a regional trail could reduce automobile use in the I-405 corridor and on other parallel routes, which would decrease pollution and GHG emissions, thereby benefiting air quality.

A 2008 report prepared by The Trust for Public Land, *Quantifying the Greenhouse Gas Benefits of Urban Parks*, established a methodology for calculating the reductions in GHG emissions that are possible to achieve by people shifting their modes of transportation from motorized to nonmotorized, given the opportunity to do so on dedicated linear pathways such as the planned ERC trail (The Trust for Public Land 2008). Based on this methodology, The Trust for Public Land completed an analysis in 2015 of the potential for GHG reductions that may result from the development of the ERC as a new nonmotorized transportation route.



Community Meetings and Public Open Houses

A summary of what King County Parks heard between June and November 2015 at the Community Meetings and Public Open Houses can be found on the CD attached to hard copies of this document or the website in the Project Library at: www.kingcounty.gov/erc

The project team used this input, along with technical information, to develop proposed alignment alternatives for the Eastside Rail Corridor Regional Trail.

Based on The Trust for Public Land analysis, which uses conservative assumptions, it is estimated that the development of the ERC will eliminate over 575,000 vehicle miles traveled (VMT) per year, which would reduce carbon dioxide (CO₂) emissions by approximately 524,000 pounds per year (The Trust for Public Land 2016). According to this organization’s report, this is the equivalent of the carbon sequestered by about 6,100 tree seedlings grown for 10 years or 195 acres of forest in the United States in 1 year. Considered on a “per trip basis” using this methodology, every 1 mile biked on the ERC, rather than driven, results in emission saving of 0.91 pounds of CO₂.

The Trust for Public Land analysis recognizes that actual use of trail corridors as an alternative to car travel is highly variable in response to factors such as cultural norms, climate, and public education. However, using conservative assumptions for these variables, the analysis predicts that actual utilization and GHG reduction benefits in King County will “outperform” the predicted outcomes.

INCORPORATE EASTSIDE HERITAGE AND CULTURE

The trail would become a place to memorialize and celebrate the culture of Native American peoples and the heritage of the original railroad line. Art installations and urban design elements would also enhance neighborhoods along the corridor. The Wilburton Trestle, the railroad bridge across I-90, and other key locations along the corridor would preserve and transform Eastside landmarks into favorite public places.

1.4 COMMUNITY ENGAGEMENT

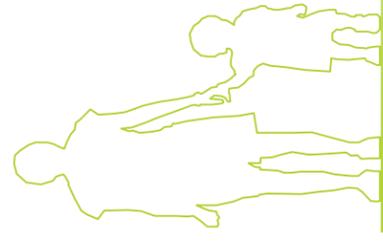
To realize the goals and the full potential of the ERC trail, King County has engaged with stakeholders and the broader community in a process spanning 18 months. King County Parks will continue to engage with communities and stakeholders as alternatives are refined and through completion of the Master Plan. Through this process, King County has been working to understand the community’s various interests and ideas and to incorporate those ideas into this Master Plan. Public engagement has included the activities below.

Collaboration with Local Jurisdictions

Although the Cities of Renton, Bellevue, and Woodinville are not owners of the railbanked portion of the ERC, they are critical partners for the successful planning, development, and operation of the trail. King County began coordinating with these local jurisdictions in June 2014 to understand how the regional connections envisioned could be made and to understand and incorporate their perspectives on the project. That collaboration has continued, with recently held meetings in September 2015 to discuss preliminary information about the alternatives included in the Master Plan.

Discussions with Key Businesses

Engaging local businesses, organizations, and economic centers is key to developing a trail that successfully integrates with the built environment. King County met with businesses and prominent organizations in both Bellevue and Woodinville. In Bellevue, the project team was joined by representatives from the City of Bellevue, Overlake Medical Center, Seattle Children’s Hospital, Whole Foods, and REI. Wright Runstad and KG Investments, two companies working closely on the development of Bellevue’s Spring District, were also in attendance. Meeting participants in Bellevue said they view the trail as a major benefit for their employees and visitors, and asked King County to create logical access points and connections along the trail in the area. They also recognized the future trail as an important factor in the development of the urban environment and transportation hub shaping Bellevue’s economic future. In Woodinville, King County was joined by a representative from the City of Woodinville, rail advocates, and local businesses along the Spur. Participants in the Woodinville session expressed a strong interest in maintaining rail operations there as the trail develops on the railbanked portion, sustaining current business operations for light industrial companies along the Spur, and supporting the area’s burgeoning tourism economy.



1.5 OVERVIEW OF THE MASTER PLAN

Scoping Meetings

In June 2015, King County hosted three meetings in Renton, Bellevue, and Woodinville to kick off master planning and scoping for the EIS. Attendees were asked to provide input on trail design concepts, provide feedback on how they envisioned using the trail, and identify concerns that should be addressed in the EIS. In July 2015, King County met with several of the agencies responsible for permitting the trail, including the local jurisdictions, as well as the Washington State Department of Transportation.

Follow-up Open Houses

In October 2015, King County hosted three open houses in Renton, Bellevue, and Woodinville to share how some of the comments submitted during scoping were being addressed and to gather input on the alternatives presented in the Master Plan. At these drop-in meetings, attendees were asked to provide input on what amenities they would like to see incorporated in the trail, as well as access points to and from the trail. Each workshop presented segment maps that depicted the alternative trail alignments.

Themes common to both the scoping meetings and the follow-up open houses were the importance of connections and access to other trails, parks, transit, businesses, and parking, and the safety and comfort of trail users and adjacent property owners.



FEBRUARY 2016

The Master Plan is a key step in defining where the trail would be located within the corridor, what the trail would look like, and how the trail would connect to surrounding communities.

The Master Plan, however, is only one of the early steps towards the design, permitting, and construction of a trail in the ERC. The Master Plan describes general options for the location of the trail within the ERC corridor—the spatial envelope for the trail—and the design criteria for how the trail would be constructed. The Master Plan also describes potential implementation strategies.

King County recognizes that there are different approaches to developing a trail while maintaining flexibility for other future uses. Given the complexities, this Master Plan:

- Describes alternatives for locating the regional trail
- Evaluates the potential impacts of the different alternatives in an environmental impact statement
- Reflects feedback from the public and other agencies gained through the master planning process

Upon review of the Draft Master Plan and public and agency comments received, the King County Executive will select a preferred alternative and present a Final Master Plan for King County Council adoption (Figure 1-2). Design and construction of the trail is anticipated to begin soon after the adoption of the Master Plan. Design and construction would likely occur by corridor segment, based on funding availability.

Chapter 2 provides a more detailed description of the corridor and its surroundings.

Chapter 3 presents design guidelines for the trail such as trail width, surfacing, and treatments at road crossings.

Chapter 4 describes the trail alternatives by segment.

Chapter 5 describes how the Master Plan could be implemented.

PART 2 DRAFT ENVIRONMENTAL IMPACT STATEMENT

Chapter 6 analyzes the potential environmental consequences. This section contains the draft environmental impact statement that supports the master planning efforts.

Chapter 7 includes the list of references.

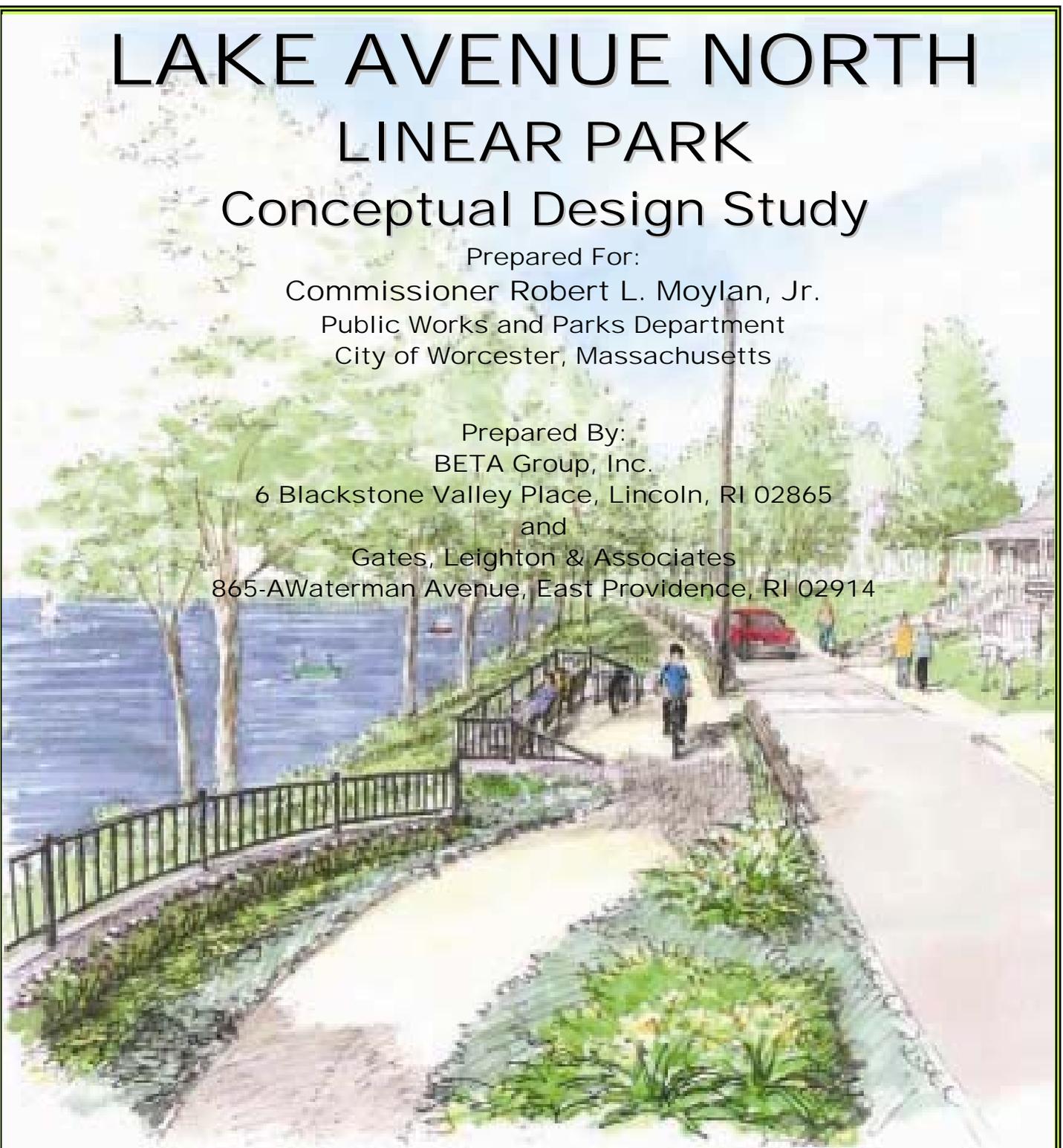


FIGURE 1-2. MASTER PLANNING TIMELINE

LAKE AVENUE NORTH LINEAR PARK Conceptual Design Study

Prepared For:
Commissioner Robert L. Moylan, Jr.
Public Works and Parks Department
City of Worcester, Massachusetts

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BETA Group, Inc.
Engineers • Scientists • Planners

GLA
Gates, Leighton & Associates, Inc.
LANDSCAPE ARCHITECTURE

April 2009

WORCESTER, MASSACHUSETTS



LAKE AVENUE NORTH

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LAKE AVENUE NORTH

executive summary

BETA Group, Inc. and Gates, Leighton and Associates, Inc. were retained by the City of Worcester to advance the feasibility study and concept design of a linear park including a pedestrian - bike trail along Lake Quinsigamond and Lake Avenue North. The linear park would extend from approximately Regatta Point to Natural History Road (Section 1) and from Natural History Road to Lincoln Street (Section 2), a distance of 8800'. The park would be developed on publicly owned land adjacent to the Lake and within the existing Right of Way for Lake Avenue North. Area for the park will be created by narrowing the existing pavement on Lake Avenue North. This would be accomplished by designating certain sections of the roadway as one-way. The linear park would have the benefit of improving public access along an underutilized section of the lake shore, as well as improving the quality of life for residents along Lake Avenue North by improving traffic conditions and pedestrian activities.

Worcester is a City of intense sporting and recreation facilities. The proposed linear park would be an asset and provide a linkage system to other recreational facilities throughout the City. The linear park would lie adjacent to Quinsigamond State Park, which consists of 2 areas, Regatta Point Park and Lake Park, and provide a connection to the East Side Trail. The East Side Trail (EST) is a continuous greenbelt through the City which links East Park (Christoforo Columbo Park) and Lake Quinsigamond. These existing recreational facilities attract thousands of visitors each year. A linear park will promote enjoyment of the lake front for walking, bicycling, jogging and related passive recreational activities. The inclusion of overlooks will provide areas to view the lake and its special events.

The City's Department of Public Works and Parks (DPW&P), through its Engineering Division prepared preliminary findings regarding the feasibility of a pedestrian - bike trail in a report titled "**LAKE AVENUE NORTH - WORCESTER, An investigation into the potential for a promenade deck**", dated Fall, 2005. The report discussed the consideration of making Lake Avenue North a one-way street northbound between Mohican Road and Natural History Road and onto Plantation Street.

The report noted several areas along the Lake Avenue North corridor that were potentially constrained by the width of the existing roadway, coupled with steep slopes down to the lake. Given the potential constraints, the City retained an Engineering consultant to further advance the feasibility study. The DPW&P looked to Beta and GLA to advance the concept, further develop design ideas, and review funding potential.

The City has recognized the potential to enhance the public enjoyment of a significant portion of the Lake Quinsigamond shoreline through the development of this linear park. This report presents the findings of the feasibility/concept design effort undertaken by BETA Group, Inc. and Gates, Leighton and Associates, Inc. in conjunction with the Department of Public Works and Parks.



LAKE AVENUE NORTH

overview

Lake Quinsigamond is the dominant land use feature within the northeast part of the City, extending from Route 20 northerly to I-290. The lake also represents the boundary between Worcester and Shrewsbury. The City has recognized an opportunity to potentially utilize existing publicly owned land adjacent to the northerly end of the lake for both passive and active recreation in the form of a linear park. Development of the park would promote public access to the lakeshore along much of the length of Lake Avenue North. Modifications to the roadway to provide one way circulation and a narrower pavement will ease traffic concerns within the residential area of the project and improve the quality of life for the residents along the roadway.

Modifying Lake Avenue North to a southbound one way street will allow for a wider travel lane and accommodation of the linear park, with adequate pedestrian and vehicular separation between the two. Residents can access their homes via Plantation Street and Natural History Road, both two way circulation routes, or travel via Lake Avenue North southbound. Vehicles exiting driveways or streets onto Lake Avenue North will be presented with a safer circulation route, having a wider one way road and decreased traffic volumes.

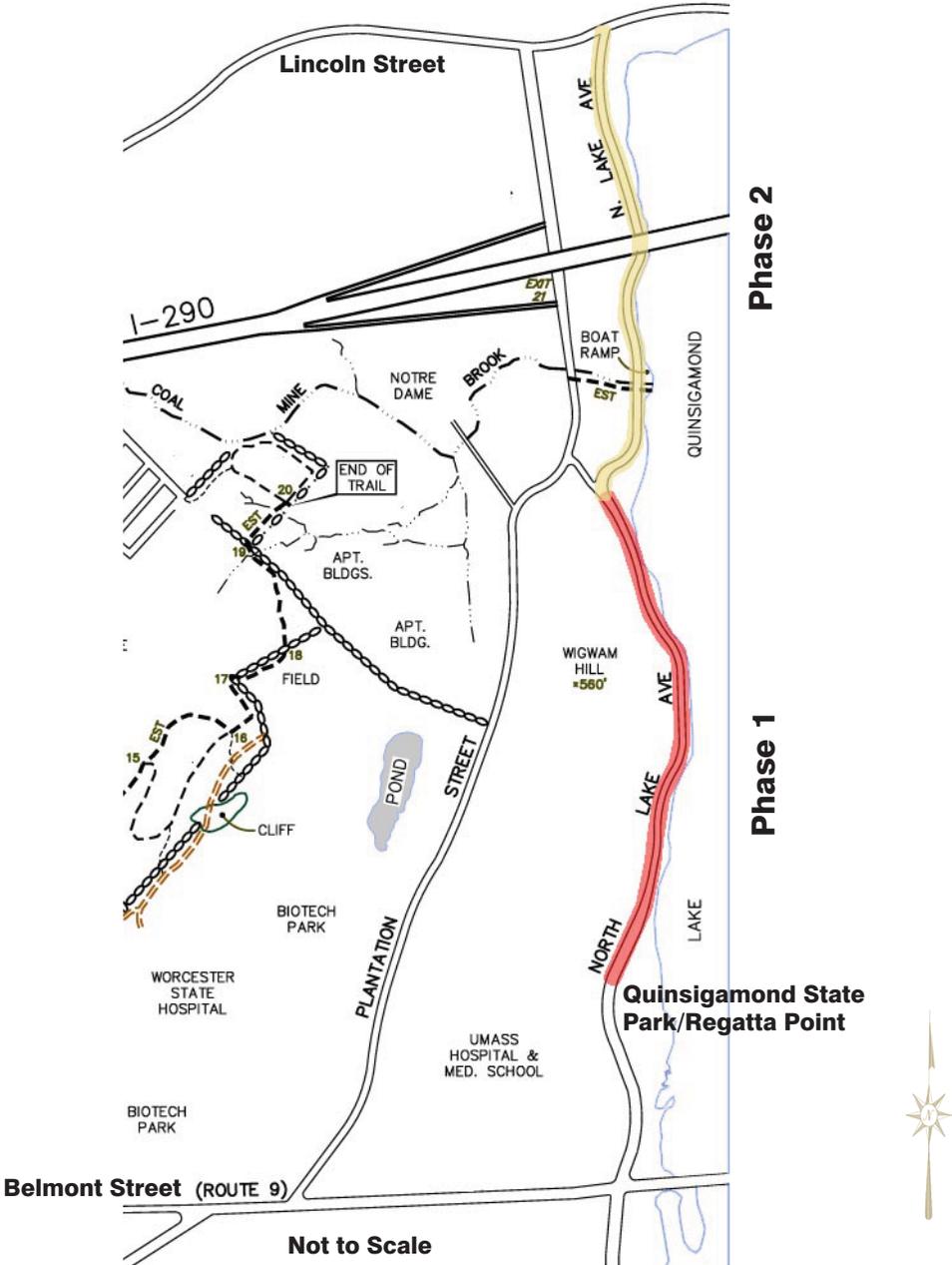


LAKE AVENUE NORTH

overview

The project corridor includes Lake Avenue North from its intersection with Belmont Street to its intersection with Lincoln Street. The corridor is separated into two sections:

- **Phase 1** from Belmont Street to Natural History Road
- **Phase 2** from Natural History Road to Lincoln Street



LAKE AVENUE NORTH

existing conditions

The general limits of the park within Phase 1 are envisioned as Quinsigamond State Park/Regatta Point to the south and Natural History Road to the north. Phase 2 extends from Natural History Road to Lincoln Street and also incorporates a parcel of city owned land on the west side of Lake Avenue North adjacent to the Fallon Clinic.

Certain portions of the corridor are constrained in regard to available width for development of the park and trail. In Phase 1, north of Belcourt Road the corridor becomes constrained due to a number of factors: the paved roadway narrows; the road is closer to the edge of the lake and the associated steep embankments on the easterly side; steep embankments exist on the westerly side from Wigwam Hill; and the houses are constructed closer to the edge of pavement. Likewise, in Phase 2 where the corridor passes beneath I-290 the available width narrows significantly. These constraints require a variable approach to fitting the road and linear park into the available space while maintaining the character of the area.



The existing City-owned right of way through the corridor varies in width, but is sufficient to accommodate the proposed improvements without acquisition of private property. The easterly edge of the right of way is defined by the lake shore. The westerly edge at its narrowest point is approximately three feet off the edge of the existing pavement.

A linear park would promote enjoyment of the lake front for walking, bicycling, jogging and related passive recreational activities. One goal of the feasibility study is to identify areas where overlooks can be constructed. Overlooks would be located in strategic points to maximize views of the lake, landscape and special events, such as Regattas, races and rowing events. A linear park will also promote opportunities for coordinated planning during special events with Regatta Point. In addition to the park, a sidewalk is being considered on the westerly side of the corridor. This sidewalk would provide a safe pedestrian walkway, particularly for the residents along Lake Avenue North and allow them to safely cross the road. The sidewalk would also encourage shared use of the park among neighboring communities, businesses, recreational and educational facilities.



LAKE AVENUE NORTH

existing conditions

The project area is along the western edge of Lake Quinsigamond and follows Lake Avenue North from its intersection with Belmont Street (Route 9) northerly to Natural History Road and continuing on Lake Avenue North to Lincoln Street. The total length of the project area is approximately 8,800 linear feet.



Lake Avenue North is a City owned two-way roadway that runs in a north-south orientation. Lake Avenue North parallels Lake Quinsigamond to the east and is a connection between Belmont Street (Route 9) and Lake Avenue with Lincoln Street. Lake Avenue North also provides a connection to Plantation Street via Natural History Road. Lake Avenue North provides access to the University of Massachusetts Medical School campus (UMMS), Quinsigamond State Park (Regatta Point), Lake Park, residential homes north of UMMS, the Fallon Clinic, National Guard facility on Lincoln Street and lies adjacent to the East Side Trail. Lake Quinsigamond is also home to the Donahue Rowing Facility and the ECAC Eastern Spirits.

Regatta Point is a 25 acre park that offers swimming, fishing, boating and sailing opportunities. It also hosts several community sailing programs, has daily racing events in the summer months and is home to the Quinsigamond Rowing Association. The 2000 meter rowing course established on Lake Quinsigamond is internationally recognized as one of the best in the world. Each year, the Regatta Point racing events draw thousands of visitors.



LAKE AVENUE NORTH

existing conditions

Lake Park, which lies to the south of the proposed linear park, is Worcester's third largest municipal park. It lies on the west side of Lake Avenue opposite the state park (a.k.a. LAKE PARK) and is bounded by Lake Avenue, Coburn Avenue and Nonquit Street. Lake Park includes Tivnan Field, a premier baseball facility.

The East Side Trail, part of the City's trail network, runs perpendicular to Lake Quinsigamond just south of the I-290 overpass. It crosses Coal Mine Brook and leads to Belmont Street and Bell Pond. The East Side Trail begins at Bell Pond, and connects to the Green Hill Park Trail. The proposed linear park would provide a connection to the Worcester County Trail System at the Herb Orcutt Memorial Landing.

The Donahue Rowing Center across Lake Quinsigamond in Shrewsbury serves area high school and college crew programs as well as community rowers and is one of the largest rowing facilities in the northeast. The rowing center also offers rack rental space and storage bays. Worcester PolyTech Institute, Holy Cross and Clark University's rowing teams all have their home base at the Donahue Rowing Center. The center is approximately 10 minutes from Clarks' campus and is considered one of the best waterways for crew competition in the country.



LAKE AVENUE NORTH

existing conditions

PHASE 1

From Belmont Street northerly to UMMS's North Road the road is a four lane section (two lanes in each direction) divided by a variable width median. North of North Road, Lake Avenue North becomes a two lane roadway. The overall roadway width varies from about 90 feet in the four lane divided section to about 20 feet at its narrowest point. The posted speed limit is 30 MPH. There is an existing sidewalk on the easterly side of Lake Avenue North extending from Belmont Street to the northerly limit of the parking lot at the state park. There are no other sidewalks within the project area. On-street parking is prohibited along both sides of Lake Avenue North within the project limits.

The existing right of way width along Lake Avenue North varies. Between Belmont Street and Mohican Road the right of way width is approximately 100 feet. North of Mohican Road, at the limit of the state park property, the edge of Lake Quinsigamond becomes the easterly edge of the City's right of way. The right of way width between Mohican Road and Natural History Road is about 59 feet at its narrowest point.

There are a number of side streets that intersect Lake Avenue North within Section 1. These include South Road and North Road (private streets owned by University of Massachusetts Medical School campus), Mohican Road, Winneconnett Road, Dominion Road, Belcourt Road, Sonoma Drive, Nana Trail and Totem Trail. These streets, which provide access to the abutting residential properties are narrow and in poor condition.

The houses along Lake Avenue North generally have limited setback from the edge of pavement. There are numerous driveway openings, stairs, walls and fences within close proximity to the edge of the roadway.

Lake Avenue North is relatively flat with gentle profile changes. North of the UMMS, the roadway narrows and the close proximity of the road to the lake results in the road edge being adjacent to a steep embankment. This area also coincides with some of the narrowest sections of pavement and steepest embankments to the west of the road, creating sight distance restrictions for vehicles traveling both northbound and southbound.



Limited roadway width and visibility along Lake Ave North.

LAKE AVENUE NORTH

existing conditions

The embankment between Lake Avenue North and Lake Quinsigamond is heavily vegetated with a mixture of mature evergreen and deciduous trees combined with smaller trees, shrubs and brush. In many areas the view from the roadway and abutting houses to the lake is almost completely blocked by the vegetation. In a few locations the vegetation has been cleared and/or thinned to allow visual access to the lake. There are some areas of erosion along the edge of pavement and along paths/stairs down to the water.

Quinsigamond State Park provides the only public access to the lake within Section 1. There are, however, a number of private boat docks located along the lake. Access to these docks is from the embankment between the edge of pavement and the lake shore. In some cases, private stairways have been constructed along the embankment and at certain locations there are breaks in the guardrail allowing access to the embankment. These structures and paths are located within the City owned Right of Way.

As noted in the DPW&P report, the deeds for the properties along Lake Avenue North do not provide for any permitted access to the lake except for access to the “public” beach at the northerly end of the project. There is no formal access to this beach area.



Private access to Lake Quinsigamond.



Break in guardrail identifies existing access path to Lake Quinsigamond.

LAKE AVENUE NORTH

existing conditions

PHASE 2

Lake Avenue North within Section 2 is a two lane, two way roadway from Natural History Road to Lincoln Street. Pavement widths range from approximately 26 feet near the I-290 overpass to approximately 70 feet approaching Lincoln Street. Coal Mine Brook passes under Lake Avenue North in a box culvert structure approximately 425 feet north of Teconnett Path. Teconnett Path is the only intersecting street within Section 2. The Worcester Regional Transit Authority (WRTA) has a scheduled bus route (Route No. 16) that serves Fallon Clinic and includes bus stops on Lake Avenue North between the Fallon Clinic driveway and Lincoln Street. There are no sidewalks within Section 2 except for a very limited area under the I-290 overpass. There are some on-street parking restrictions along the east side of the road. There is no speed limit posted within Section 2.



Existing conditions at I-290 overpass.



Expansive roadway widths and parking adjacent to the Fallon Clinic.



LAKE AVENUE NORTH

existing conditions

This section of the project has a boat launch located adjacent to an existing well building. The ramp is identified as the “Herb Orcutt Memorial Landing”. The ramp has been blocked and is no longer accessible. This area is also known as “Brownie Beach”. There are several private docks located behind the houses adjacent to the Lake.



View of Brownie Beach looking West.



Existing 'Herb Orcutt' memorial landing plaque at Brownie Beach.



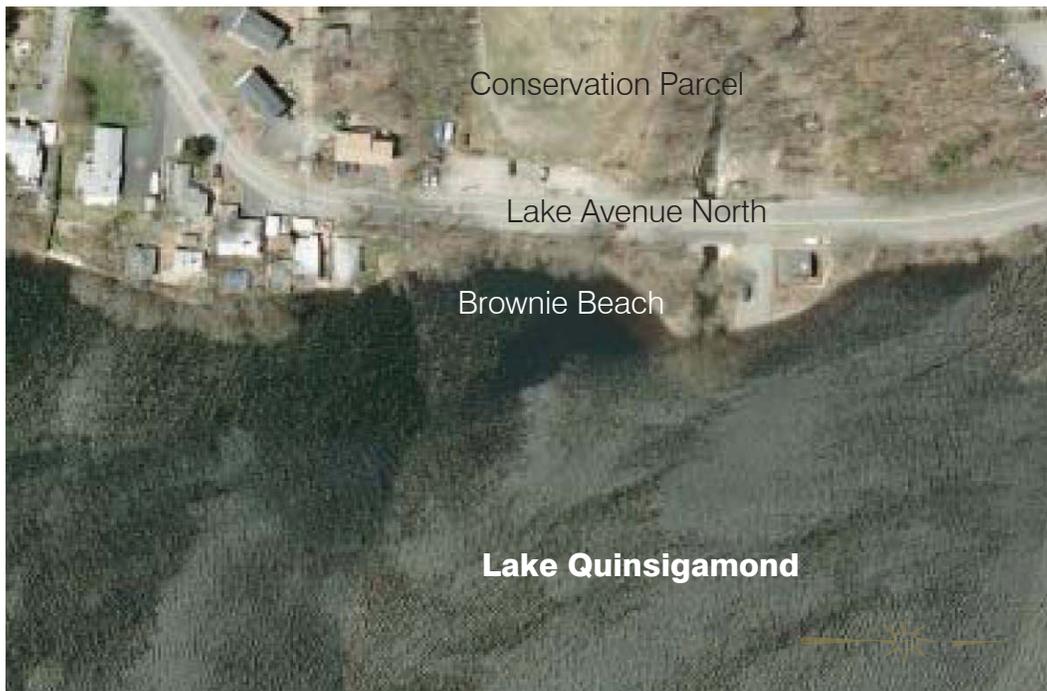
LAKE AVENUE NORTH

existing conditions

A city owned parcel of land is located on the west side of Lake Avenue North adjacent to the Fallon Clinic. The parcel has an area of approximately 5.3 acres, according to assessor's information, and fronts on both Lake Avenue North and Plantation Street. The parcel is subject to a conservation restriction granted to the Greater Worcester Land Trust, Inc. and the Worcester Parks and Recreation Commission. The conservation restriction generally limits the use of the parcel to passive recreational activities, educational activities and maintenance of the public water supply. The parcel is partially wooded and partially open field and is surrounded by a chain link fence. Coal Mine Brook runs through the northerly end of the parcel before discharging to Lake Quinsigamond. A section of the East Side Trail parallels Coal Mine Brook as it passes through the parcel.



Coal Mine Brook looking West.



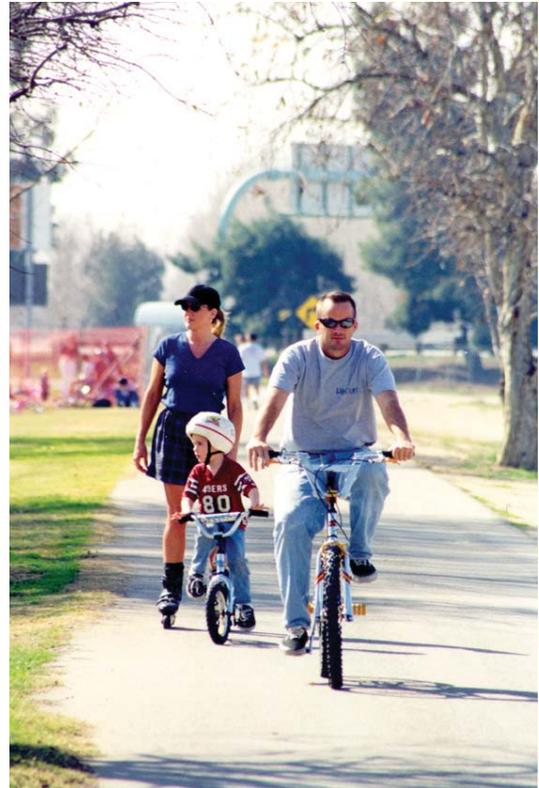
LAKE AVENUE NORTH

feasibility/concepts

The City has realized the potential for the development of a linear park, along Lake Quinsigamond and within the right-of-way for Lake Avenue North. The park will be an opportunity to increase public enjoyment of the Lake Quinsigamond shore line, while reducing environmental impacts from uncontrolled use. It is proposed that the park should include elements for passive recreation, viewing the lake, sitting areas and a pedestrian-bike trail. Development of the park will also provide opportunities to modify and improve traffic circulation on Lake Avenue North and overall traffic circulations along the corridor. While the park concept should be developed to enhance the overall experience of all users, the pedestrian - bike trail should be designed to enhance property values, meet current safety standards and provide enjoyment of the users.

The feasibility of constructing a bike path within the corridor must take into consideration a number of components. These include:

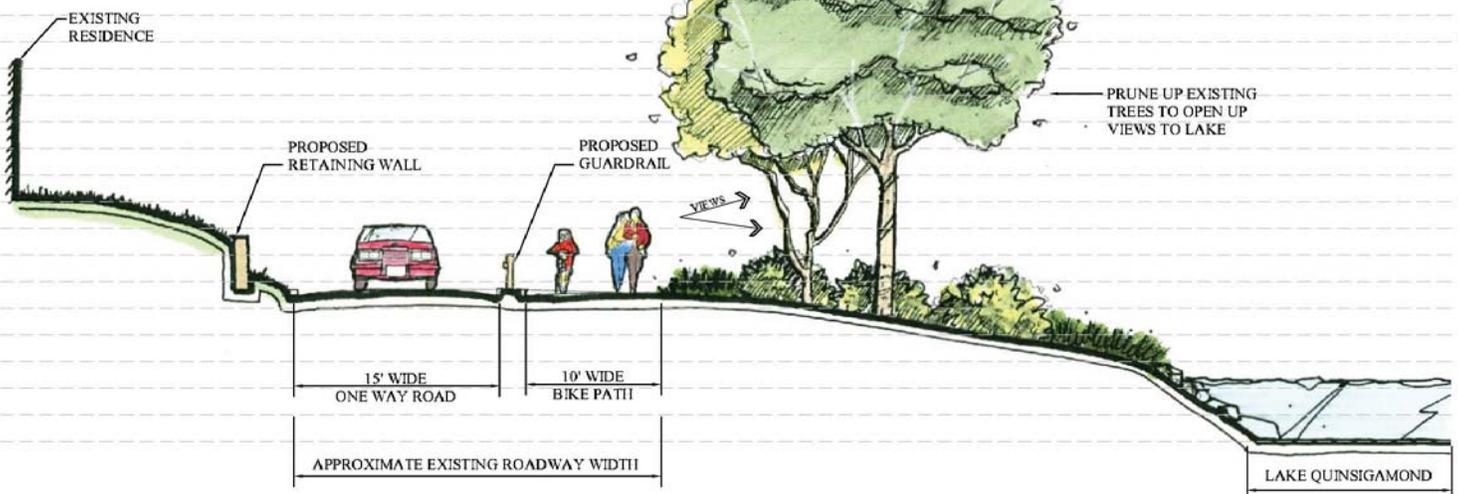
- Physical characteristics of the corridor
- Improvements to sustainability of the corridor
- Improvements to storm water runoff
- Availability of Right of Way
- Impacts on the environmental resources
- Impacts on abutting properties
- Impacts on traffic circulation and travel times
- Impacts on existing utilities
- Access and parking opportunities
- Safety for residents and visitors
- Implementation Cost and Funding Sources



LAKE AVENUE NORTH

feasibility/concepts

Typical cross section - Minimum Width.



Development of variable width cross sections for the path will allow for evaluation of the adequacy of available space and identification of the constraints within the corridor. A review of suggested design criteria in both the Massachusetts Highway Department *Project Development and Design Guidebook* and the *AASHTO Guide for the Planning and Design of Bicycle Facilities*, indicate that a two-way multi-use path should have a minimum width of ten feet. Additional width is needed to accommodate shoulders, offsets to objects and buffers. A separation of five to seven feet is recommended between the roadway and the edge of the path. Where this separation cannot be obtained, a physical barrier is recommended. Shoulders, two to three feet wide, should be provided on both sides of the path. The shoulder is included within the recommended separation between the path and the roadway.

In addition to the path, a typical cross section must be developed for a one-way Lake Avenue North roadway. The typical section includes a travel lane, shoulders (offsets) and a sidewalk. Sidewalks are recommended to have a minimum width (including curbing) of 5'-6" to meet ADA requirements.

Providing dimensions for the path and the roadway which meet or exceed the minimum values included in the MassHighway and AASHTO guidelines will promote safety for both path users and drivers on Lake Avenue North. The following minimum cross section elements are suggested for Lake Avenue North and the bike path:

- 11 foot travel lane
- 2 foot shoulders on both sides of the roadway
- 5'-6" sidewalk on the west side of Lake Avenue North (Phase 1)
- 10 foot bike path
- 2 foot minimum shoulders/offsets on both sides of the path

The above elements result in a minimum width of 34'-6". In areas where additional width can be obtained without adversely impacting abutting properties (driveways, stairs) or encroaching on the embankment adjacent to the lake, the buffer between the road and the path should be maximized. The proposed typical cross sections are shown in the Appendix.



LAKE AVENUE NORTH

feasibility/concepts

PHASE 1

Section 1 offers an opportunity to connect with Regatta Point and extend a park corridor northerly along Lake Avenue North. The roadway through this section is located at an elevation that varies from approximately 12 feet to 34 feet above Lake Quinsigamond. The embankment between the edge of road and the lake is fairly steep with slopes of 2:1 or steeper.

Considerations for roadway modifications in this section include designating Lake Avenue North as a one-way street and providing a narrowed pavement width, thereby allowing additional space for the park elements. The trail would be developed adjacent to the roadway with a landscaped median or guardrail barrier as a buffer between them. Overlook areas and minor parking facilities are also proposed. All features are designed to minimize encroachment onto the existing embankment.

There are several critical areas in the Section 1 corridor. These are locations where the existing pavement width is narrow and there are steep embankments on both sides of the road. In these areas the proposed cross section is wider than the available width of the existing pavement. Therefore, the bike path will encroach on the embankment. Special design treatments including retaining walls, vertical separation of the path and roadway, or a boardwalk over the embankment and/or relocation of the roadway need to be considered.



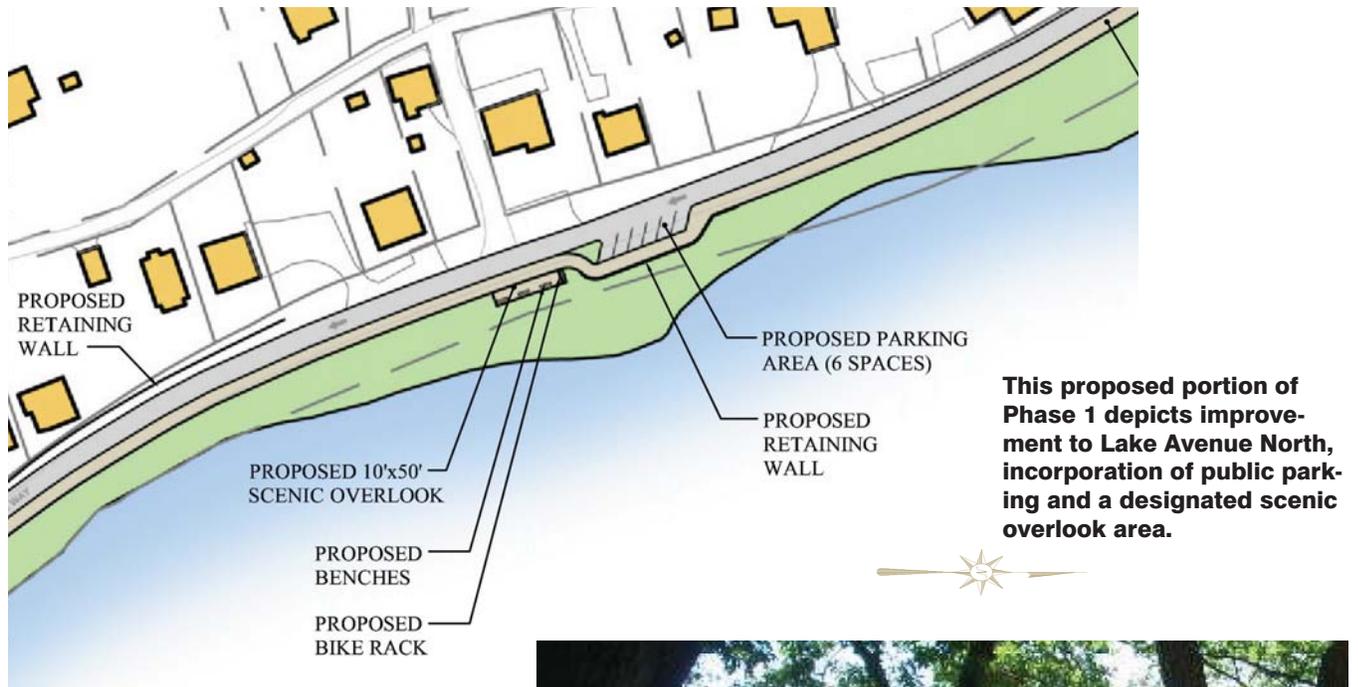
Existing narrow pavement widths in Phase 1 of Lake Avenue North.



LAKE AVENUE NORTH

feasibility/concepts

As previously noted, overlook areas should be considered where sufficient width is available. Events such as regattas or sailing could be viewed from these overlooks.



In order to enhance the view of the lake from both the overlooks and the trail, the vegetation along the embankment needs to be addressed. Rather than extensive clearing of the embankment, thinning and pruning of vegetation to provide view corridors is recommended. This would allow improved views to the lake while minimizing actual disturbance of the slope.



Selective clearing in this location would enhance views to Lake Quinsigamond.



LAKE AVENUE NORTH

feasibility/concepts

The design of storm drainage and storm water management facilities is integral to design of the park. Existing catch basins are located at several points along the roadway, and it is likely that these catch basins discharge directly to Lake Quinsigamond. Since it appears that there currently are no substantial flooding issues on Lake Avenue North, complete replacement of the drainage system is not recommended. Narrowing the roadway pavement and construction of the park and trail present an opportunity to improve the existing storm drainage along the roadway. Areas that can support a maximized buffer can incorporate features as part of the storm water system. Low Impact Design techniques such as vegetated swales and rain gardens could be incorporated to improve water quality of the runoff. The trail should be graded away from the lake toward the roadway. This will reduce potential for erosion along the top of the slope and allow better treatment of the runoff.



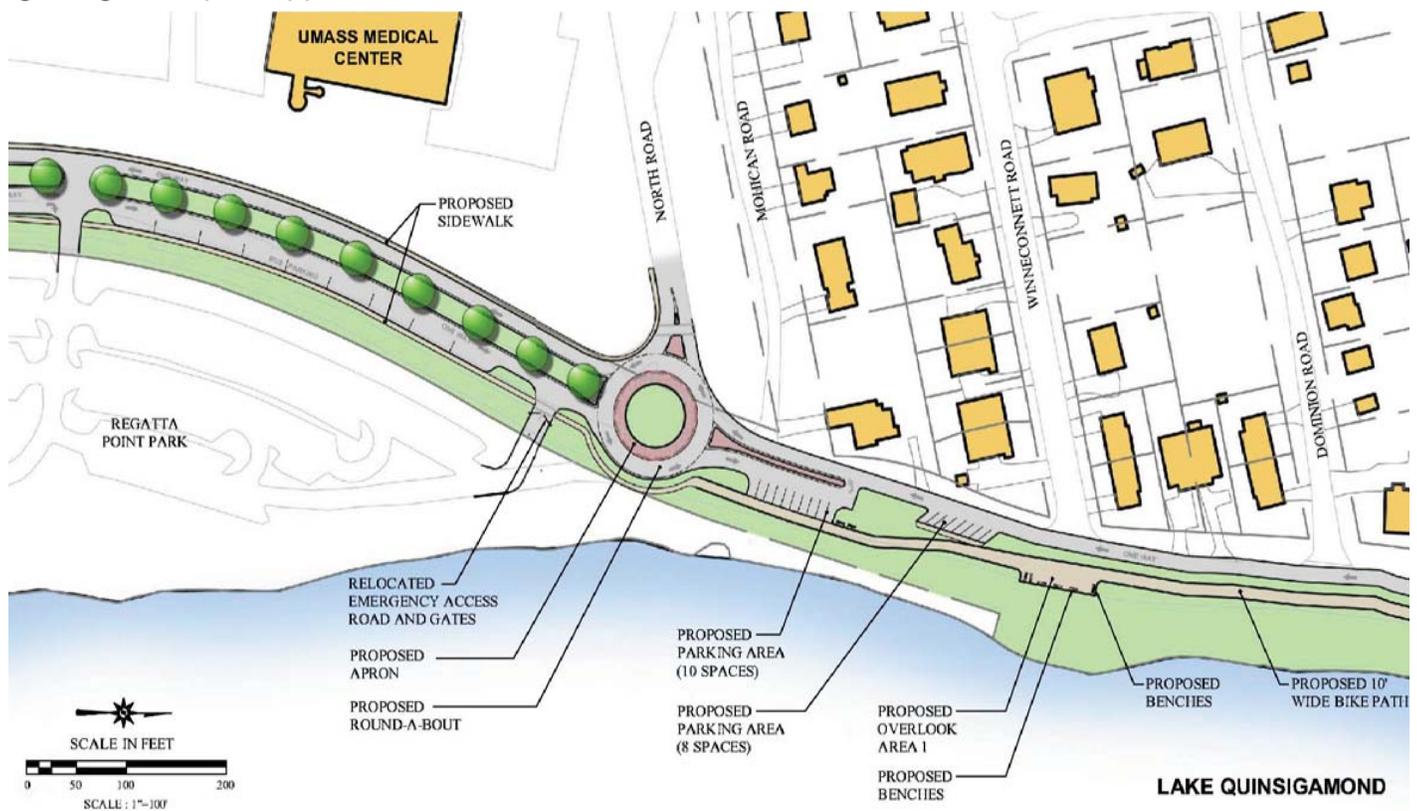
Rain garden.



LAKE AVENUE NORTH

feasibility/concepts

Access to the park should be provided at multiple locations. The linear park should connect with Regatta Point Park on the southerly end and be accessible to the Regatta Point parking lot. Coordination with Department of Conservation and Recreation (DCR) should be pursued to allow for shared use of the parking lot for users of the park and trail. Alternately or in conjunction with the parking lot, it is suggested that the park design provide both on-street and off street parking. Parallel on-street spaces (8 to 9 spaces) should be provided along the northbound side of Lake Avenue North between the entrance to Regatta Point and North Road. This can be accomplished by narrowing the roadway from two lanes to one lane and utilizing the additional pavement for parking. A small off street lot (approximately 10 spaces) can be constructed at the beginning of the path opposite Mohican Road.



To facilitate traffic flow, establish the southern limit of the park and to delineate the transition between one and two way flow a roundabout at the North Road intersection is proposed. This feature as well as street trees in the median proposed between North Road and Belmont Street will set the tone for the park character.

Intermediate access to the park and trail should be included at the overlook areas. This will enable access for the neighborhood without having to travel significant distance along the road to get to either end of the trail. New pedestrian crossings will be provided at these locations to improve the safety of users crossing Lake Avenue North to access the park. All access points will need to meet current ADA requirements for handicapped access.



LAKE AVENUE NORTH

feasibility/concepts

Research by the DPW&P revealed that the properties along Lake Avenue North have a deeded right of access only to a specific “public beach” at the northerly end of the corridor near Natural History Road. Construction of the park and trail will interrupt access to this area. In order to maintain this access, an ADA compliant ramp/walkway should be constructed from the trail down to the lake to incorporate this area into the park concept.

The proposed conceptual alignment will have some impact on abutting properties. Some re-grading of driveways will be required to accommodate the new sidewalk. Also, the width of existing driveway openings will need to be reviewed and adjusted where necessary to be consistent with the new sidewalk.

At two properties (# 221 and #233) there are existing stairs from the front yard down to the edge of the roadway pavement. These stairs are located partly within the existing right of way. They are in poor condition and do not appear to be used. The stairs will be impacted by construction of the proposed cross section. The City will need to decide whether or not to reconstruct these stairs to meet with the new sidewalk.

The DPW&P report documented fourteen private docks located within the project limits. The report noted that the properties on Lake Avenue North do not have deeded access to the lake front. In addition, the DPW&P reviewed the permits for the docks and found that several are owned by people from outside the City. Several owners have constructed stairways from the roadway down to the docks. The condition of the stairways varies from fair to poor. It is noted that the stairways are located within the City’s right of way and may present some potential liability for the City. If the City, in coordination with the owners, desires to allow continued access to the docks, common (public) stairways could be provided. The most logical location for the stairs would be at the overlook areas.



Existing common stairway down to Lake Quinsigamond in the project area.



LAKE AVENUE NORTH

feasibility/concepts

PHASE 2



Phase 2 begins at the intersection of Natural History Road. This section offers some unique features that should be incorporated into the park concept. They include Brownie Beach at the boat ramp, the conservation parcel, East Side Trail, the City's Coal Mine Brook pump house and the City owned parcel at the intersection of Lake Avenue North and Lincoln Street.

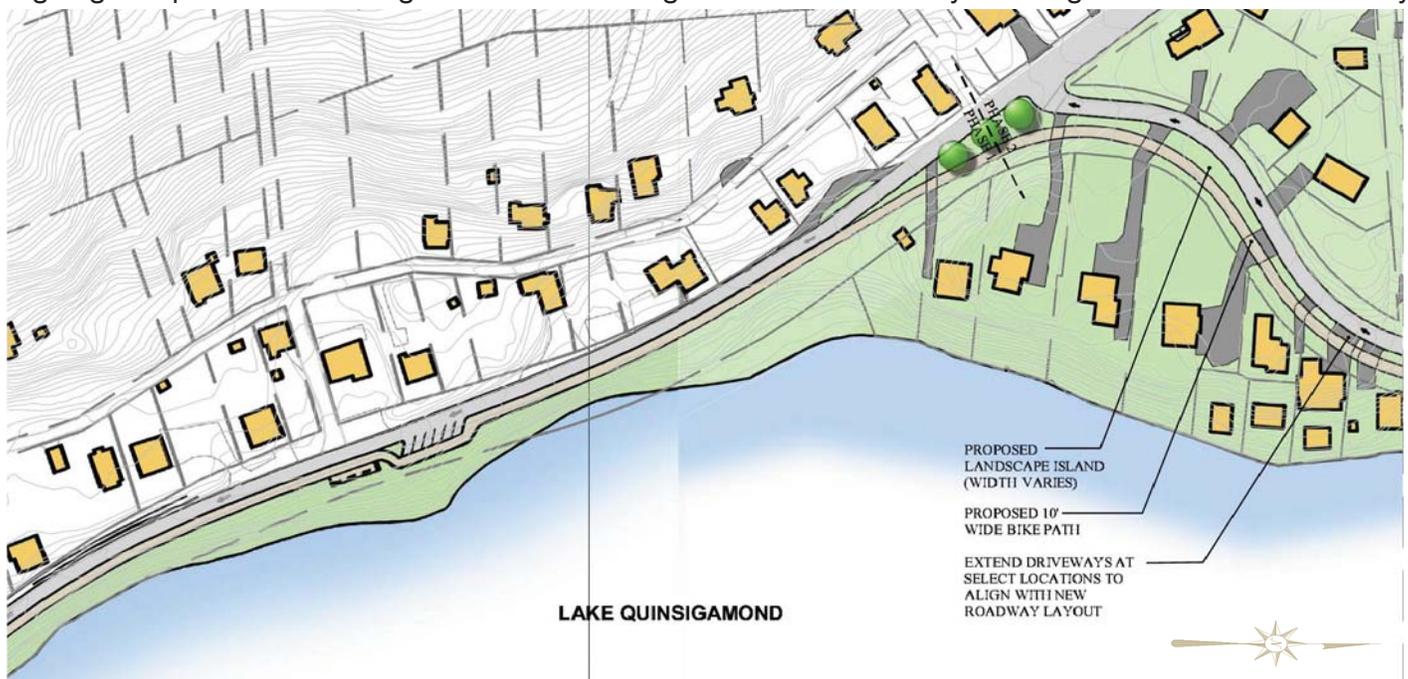
Roadway modifications in Section 2 include maintaining two-way traffic on a narrowed pavement area between Lincoln Street and a proposed parking area adjacent to the conservation parcel. This parking area can serve as a midpoint access to the park and trail and also as a parking area and trail head for the East Side Trail. South of the proposed parking area and extending to Natural History Road, Lake Avenue North is recommended to be one-way southbound. This would compliment the one-way southbound circulation proposed for Section 1.



LAKE AVENUE NORTH

feasibility/concepts

A one-way southbound section approaching Natural History Road will allow for a narrowed pavement, as well as, decreased paved area at the intersection. This will increase the available space between the proposed edge of road and the residential properties to the east, and accommodate a four foot landscaped buffer between the trail and the road. The trail will stay entirely within the existing right of way and will not extend any closer to the houses than the existing edge of road. The existing driveways will need to be extended to meet the new roadway alignment. Since the pedestrian/bike trail will cross these driveways, special attention is needed to ensure user safety. The driveway extensions need to be aligned to maximize sight distance for vehicles entering or exiting the driveways as well as for pedestrian/bicyclists approaching the driveways. Signing and pavement markings on the trail alerting users to the driveway crossings will also increase safety.



A primary consideration in proposing a one-way southbound circulation between Natural History Road and the proposed parking area is the restricted width on Lake Avenue North between houses #344 and #345. This combined with dramatic horizontal and vertical curves makes this section challenging. Providing a two way roadway with a minimum width for the pedestrian-bike trail requires approximately a 42 foot cross section. The existing pavement width is about 28 feet. While sufficient right-of-way is available for a two way section, there would be significant encroachment beyond the existing edge of pavement, which would exacerbate already difficult grading in the driveway at #345 and in the front yard at #344.



LAKE AVENUE NORTH

feasibility/concepts

The conservation land located adjacent to the proposed parking area is an integral area of the Section 2 park and trail concept. It sits at the end of the East Side Trail and also at the approximate mid point of the Lake Avenue North linear park. The conservation restriction prohibits uses other than passive recreation and education. As part of the park/trail concept, it is proposed that a portion of this parcel be opened to the public to serve as the trail head for the East Side Trail. Installation of benches, a kiosk supplying trail maps, educational information on Coal Mine Brook, Lake Quinsigamond and other points of interest should all be incorporated into the space to promote a passive recreational environment. A short loop trail around the parcel, including a foot bridge across the brook should be considered as a future use.



LAKE AVENUE NORTH

feasibility/concepts

The Brownie Beach area has the smallest difference in elevation between the road and the lake than of any section along the corridor. This approximately six foot difference creates an opportunity to develop a pocket park that would include an overlook area. Brownie Beach includes the Herb Orcutt Memorial Landing and the Coal Mine Brook well house. It is recommended that the existing boat ramp, which is currently closed, be modified for kayak and canoe launching. The well house will remain and would be refurbished. A kiosk or plaque would provide the public with the historical significance of the well.



Brownie Beach and existing public boat launch area.



LAKE AVENUE NORTH

feasibility/concepts

The forty foot width of the existing bridge over Coal Mine Brook is sufficient to accommodate the proposed two-way roadway and adjacent trail, while allowing for a four foot buffer between the road and the trail.



LAKE AVENUE NORTH

feasibility/concepts

Between Brownie Beach and the I-290 overpass, the distance between the edge of the road and the lake becomes narrower and the embankment steeper. Due to the constrained width, this section will include a ten foot trail and a two-way twenty-eight foot wide pavement with a four foot buffer. Beginning approximately four hundred feet south of the overpass, the available roadway space is too narrow to accommodate the proposed cross section without encroaching on the embankment to the walk. An approximately three hundred and eighty foot long retaining wall will be required through this section. The wall will have a maximum height of about four feet.

As Lake Avenue North passes under I-290, the available width available to accommodate the proposed two way roadway and trail becomes more constrained. In order to avoid extensive retaining wall construction immediately adjacent to the shore line, the alignment of Lake Avenue North and the trail are proposed to be shifted approximately seventeen feet to the west. The shifted alignment will encroach on the sloped paving under the bridge. A retaining wall will be required to support the sloped paving. Approval from MassHighway will be required for this option.



Existing conditions - view south under I-290.



Proposed conditions.



LAKE AVENUE NORTH

feasibility/concepts

North of the I-290 overpass, Lake Avenue North ascends at approximately 6.5% grade and the pavement width widens to approximately seventy feet. There is a three and a half acre City owned parcel in the southeast quadrant of the North Lake Avenue/Lincoln Street intersection. This parcel is the northern terminus of the park and the trail. The parcel represents another opportunity to create a small park area adjacent to the lake. Due to its elevation above the lake, this parcel presents excellent views. Selective clearing and thinning of existing trees will enhance these opportunities and will be a prime viewing area for regattas and special events.



Expansive asphalt allows for realignment and improvements of linear park features.

Existing driveways will need to be extended to meet the new roadway alignment. Special attention will be given to the design of the pedestrian/bike trail at these driveway crossings.



LAKE AVENUE NORTH

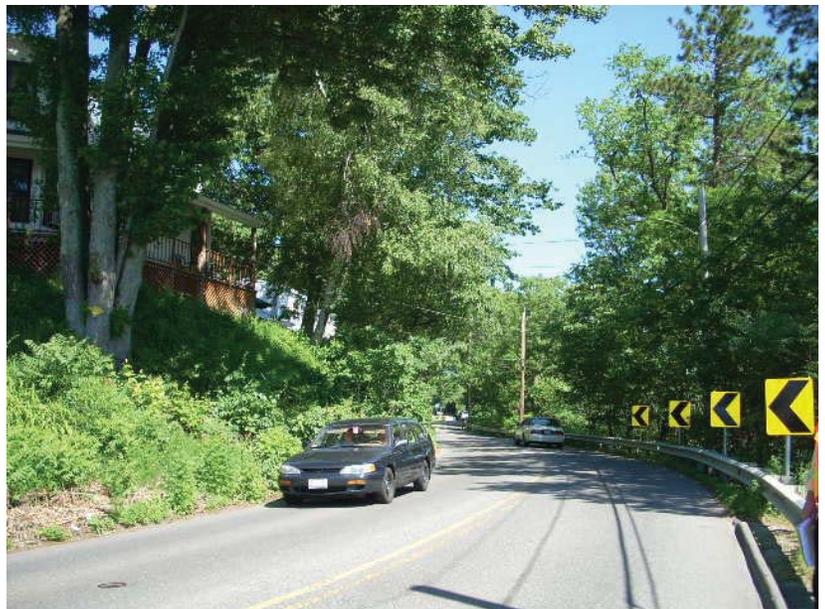
traffic

The development of the linear park and trail along Lake Avenue North can be enhanced by changes to traffic circulation patterns for the roadway. These circulation changes will not only provide more park and trail area they will also provide a benefit to the neighborhood by reducing traffic volumes on Lake Avenue North. The change in traffic patterns created by the designation of Lake Avenue North as a one-way road will impact certain intersections within the vicinity of the project. These impacts will consist of changes in traffic volumes for certain traffic movements. In some cases an increase in traffic volume for a particular movement can be expected. The scope of this study does not include an analysis of the impact of potential traffic pattern changes or the collection of new traffic data. Available historic data were obtained from the City and MassHighway to understand the general volume of traffic that may be impacted.

In addition to decreased traffic volumes on Lake Avenue North, some increase in safety should be realized as well. As previously noted, the current combination of horizontal and vertical alignment on Lake Avenue North creates areas with sight distance restrictions in both Section 1 and Section 2. These restrictions occur at locations with some of the narrowest pavement widths. Most notable are the segments between Sonoma Drive and Nana Trail and between Natural History Road and Teconnett Path.

Approximately 6,300 vehicles per day may be impacted by a change to one way circulation in Section 1 and approximately 1,400 vehicles per day in Section 2. These trips will most likely be re-distributed to Plantation Street.

With a change to one-way operation, residents along Lake Avenue North will have to adjust their driving patterns when leaving and returning to their houses. Dominion Road and Belcourt Road, while connecting through from Lake Avenue North to Plantation Street, are narrow with poor pavement conditions. Left turns from South Road to Lake Avenue North, which would allow traffic to go northbound, are prohibited due to the existing median. The most likely connection would be North Road. This would have an undesirable effect of increasing traffic on a privately owned road. The other option would be Plantation Street and Belmont Street. More studies will have to be done to understand the feasibility of the new driving patterns in these areas.



LAKE AVENUE NORTH

traffic

OTHER IMPACTS

Speeds may tend to increase along a one-way Lake Avenue North, since a consistent cross section will be provided and many of the existing constraints, such as narrow pavement and limited sight distance to on-coming traffic, will be eliminated. Proper signage, delineation and increased enforcement will discourage speeding. Traffic calming measures, such as raised crosswalks and tree plantings should be considered as permanent measures.

A comprehensive traffic study is required to fully assess the quantitative impacts of changes to circulation patterns on the surrounding roadway network and the affected intersections. As part of this study, new traffic counts, including origin and destination surveys, should be collected to assess impacts and determine the appropriate level of improvement that may be required to mitigate those impacts.



LAKE AVENUE NORTH

conclusions/recommendations

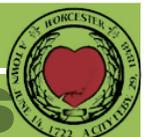
The effort undertaken as part of this feasibility study, as well as the preliminary report prepared by the DPW&P indicates that the concept of developing a linear park and pedestrian – bike path along Lake Avenue North is feasible from a design standpoint. The park will provide the benefit of enhancing public access along a significant length of Lake Quinsigamond, reducing traffic volumes along Lake Avenue North, improvements to pedestrian and vehicular safety, improvements to storm water management, and the potential for connection to neighboring uses.

The conceptual layout of the park and trail developed as part of this study has helped to define certain parameters that will need to be addressed as the project advances. The treatment of the path in the most constrained and narrow areas of the corridor will need further study. A combination of minor horizontal and vertical re-alignment, in conjunction with retaining walls is likely the most effective design for both cost effectiveness and constructability. This treatment will also improve safety of pedestrians to vehicular traffic. The most significant shift in alignment would occur in Section 2 at the I-290 overpass. This proposed re-alignment will require coordination with and approval from MassHighway.

Designating Lake Avenue North as one way between Natural History Road and North Street and between Teconnett Path and Natural History Road will allow for the development of a linear park and bike trail along Lake Quinsigamond's shoreline. This study included a qualitative review of potential traffic impacts resulting from one-way operation. A change to one-way circulation on Lake Avenue North would divert approximately one half of the vehicles to Plantation Street and potentially improve traffic patterns at intersections along Plantation Street.



Conceptual improvements to Lake Avenue North.



LAKE AVENUE NORTH

conclusions/recommendations

A. Permitting

The Lake Avenue North project corridor is within the buffer zone of Lake Quinsigamond and is subject to the Massachusetts Wetlands Protection Act, as well as, the City of Worcester Wetlands Protection Ordinance and Regulations. A Notice of Intent (NOI) will need to be filed with the Worcester Conservation Commission. It is likely that the following jurisdictional resource areas are located within the project corridor:

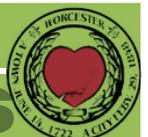
- Land Under Water
- Bank
- Bordering Vegetated Wetlands

The proposed conceptual design of the park includes a variety of activities within the buffer zone including excavation, paving, retaining wall construction, storm drainage construction and thinning vegetation. Some of the work envisioned at Brownie Beach may directly impact the lake, particularly if the existing boat ramp is removed. However, it is expected that the nature of the work will allow all permitting to be done at the local level.

Work in the City owned conservation parcel will conform to the parameters included in the deed restriction. Coordination with the Conservation Commission, Department of Public Works and Parks, as well as, the Greater Worcester Land Trust will be required as the design progresses.

The project will need to meet the Massachusetts Storm Water Management Regulations. This will be included with the NOI application to the Conservation Commission.

In addition to the NOI filing with the Conservation Commission, a Storm Water Pollution Prevention Plan (SWPPP) will need to be developed as part of the National Pollution Discharge Elimination System (NPDES) administered by the EPA. This is generally included as part of the construction documents.



LAKE AVENUE NORTH

conclusions/recommendations

B. Construction Estimate and Funding

To develop an “Order of Magnitude” cost for the project, a budgetary construction cost was developed for each section of the project based on the conceptual design. Major elements of the project costs include:

Phase 1

- Construction of approximately 3,400 feet bituminous asphalt bike path
- Overlay of approximately 3,400 feet of existing Lake Avenue North (approximately 15 feet wide)
- Construction of new cement concrete sidewalk (5'-6" wide) with granite curb
- Installation of a wood guardrail barrier between bike path and roadway
- Construction of new 'green' retaining walls
- Incorporation of LID techniques into drainage modifications, including bioswales, rain gardens and permeable pavements
- Construction of permeable parking areas
- Construction of a roundabout at North Road

The estimated budgetary construction cost for Section 1 as outlined in the conceptual design is \$1,700,000.

Phase 2

- Construction of walking path and associated passive recreation elements in city owned conservation parcel
- Construction of pocket park at Brownie Beach/boat ramp
- Construction of park elements in City owned parcel at Lake Avenue North/Lincoln Street
- Construction of approximately 3,250 feet bituminous bike path with landscaped buffer
- Asphalt overlay of approximately 2,150 feet of existing Lake Avenue North (approximately 28 feet wide)
- Asphalt overlay of approximately 650 feet of existing Lake Avenue North (approximately 15 feet wide).
- Reconstruction of approximately 550 feet of Lake Avenue North at the I-290 overpass
- Construction of new cement concrete sidewalk (5'-6" wide) with granite curb
- Construction of new retaining walls
- Incorporation of LID techniques into drainage modifications, including bioswales, rain gardens and permeable pavements
- Construction of permeable parking area

The estimated budgetary construction cost for Section 2 as outlined in the conceptual design is \$1,630,000.



LAKE AVENUE NORTH

appendix-A

Conceptual Design Phases 1 and 2

The following outlines the general recommended conceptual layout for the park and trail within each section. The concept is shown on the attached plans and cross sections.

Phase 1

Belmont Street to North Road

Conceptual improvements within this segment include:

- Reduce the northbound roadway from two lanes to one lane between the Regatta Point parking lot entrance and North Road.
- Provide 8 to 9 on-street parallel parking spaces between the Regatta Point parking lot entrance and North Road.
- Construct a roundabout at the Lake Avenue North/North Road intersection.
- Realign the northerly exit drive from the Regatta Point parking lot to meet the new roadway configuration.

North Road to Belcourt Road

Conceptual improvements within this segment include:

- Provide a one-way 15 foot wide roadway
- Construct a new 5'-6" sidewalk on the east side of the roadway.
- Construct a new 12 foot wide bituminous asphalt bike path bordered by a variable width landscaped buffer on its west side and a 2 foot shoulder on its east side.
- Construct overlooks (approximately 10' x 50') opposite Winnenconnet Road and Belcourt Road. Provide new pedestrian crossings across Lake Avenue North.
- Construct a new off-street parking lot (approximately 10 spaces) opposite Mohican Road.

Belcourt Road to Sonoma Drive

Conceptual improvements within this segment include:

- Provide a one-way 15 foot wide roadway
- Construct a new 5'-6" sidewalk on the west side of the roadway.



LAKE AVENUE NORTH

appendix-A

- Construct a new 10 foot wide bituminous asphalt bike path with a guardrail barrier on its west side and a 2 foot shoulder on its east side.
- Construct new retaining wall (3' to 4' high) along the east side of the path from 300 feet south of Sonoma Drive to Sonoma Drive.

Sonoma Drive to Nana Trail

Conceptual improvements within this segment include:

- Provide a one-way 15 foot wide roadway
- Construct a new 5'-6" sidewalk on the west side of the roadway.
- Construct a new 10 foot wide bituminous asphalt bike path with a guardrail barrier on its west side and a 2 foot shoulder on its east side.
- Construct new retaining wall (4' high) along the east side of the path from Sonoma Drive to 75 feet north of Sonoma Drive.
- Construct new retaining wall (4' to 7.5' high) along the east side of the path from 355 feet north of Sonoma Drive to 615 feet north of Sonoma Drive.

Nana Trail to Natural History Road

Conceptual improvements within this segment include:

- Provide a one-way 15 foot wide roadway
- Construct a new 5'-6" sidewalk on the west side of the roadway.
- Construct a new 10 foot wide bituminous asphalt bike path with a guardrail barrier on its west side and a 2 foot shoulder on its east side.
- Construct new retaining wall (4' to 6' high) along the east side of the path from 75 feet north of Nana Trail to 340 feet north of Nana Trail.
- Construct overlook (approximately 10' x 50') opposite Nana Trail. Provide new pedestrian crossing across Lake Avenue North.
- Construct ADA compliant walkway from bike path to "public beach" area.
- Realign curb line at Natural History Road to meet one way alignment on Lake Avenue North
- Realign driveway entrance at #298 and #302 North Lake Avenue to meet new alignment



LAKE AVENUE NORTH

appendix-A

Section 2

Natural History Road to Tenneconnett Path

Conceptual improvements within this segment include:

- Provide a one-way 15 foot wide roadway.
- Construct a new 12 foot wide bituminous bike path bordered by a 4 foot wide landscaped buffer on its west side and a 2 foot graded shoulder on its east side adjacent to existing residential properties.
- Extend existing residential driveways to meet the new roadway alignment.

Tenneconnett Path to Brownie Beach

Conceptual improvements within this segment include:

- Provide a two-way 28 foot wide roadway
- Construct a new off street parking lot (20 spaces) on the west side of the roadway within the existing widened city layout.
- Construct a new 10 foot wide bituminous bike path bordered by a 4 foot wide landscaped buffer on its west side and a 2 foot graded shoulder on the east side.
- Construct passive recreation elements in conservation parcel including looped walking path
- Construct pocket park and overlook at Brownie Beach including canoe/kayak launch.
- Provide ADA crosswalk from parking lot to park/trail.

Brownie Beach to I-290 Overpass

Conceptual improvements within this segment include:

- Provide a two-way 28 foot wide roadway
- Construct a new 5'-6" sidewalk on the west side of the roadway.
- Construct a new 10 foot wide bituminous bike path with a variable width landscaped buffer (4 foot to 18 foot) on its west side and a 2 foot graded shoulder on its east side.
- Construct new retaining wall (4' high) along the east side of the path from 430 feet south of the overpass to approximately 50 feet south of the overpass.
- Shift Lake Avenue North alignment approximately 17 feet to the west and construct retaining wall under bridge on the west side of the roadway.



LAKE AVENUE NORTH

appendix-A

- Construct 5'-6" sidewalk on the west side of the road within the approximate limits of the overpass

I-290 Overpass to Lincoln Street

Conceptual improvements within this segment include:

- Provide a two-way 28 foot wide roadway
- Construct a new 10-12 foot wide bituminous bike path with a variable width landscaped buffer (4 feet to 30 feet) on its west side and a 2 foot graded shoulder on its east side.
- Construct park elements on the 3.5 acre city owned parcel including overlook area.



appendix-B Phase 1

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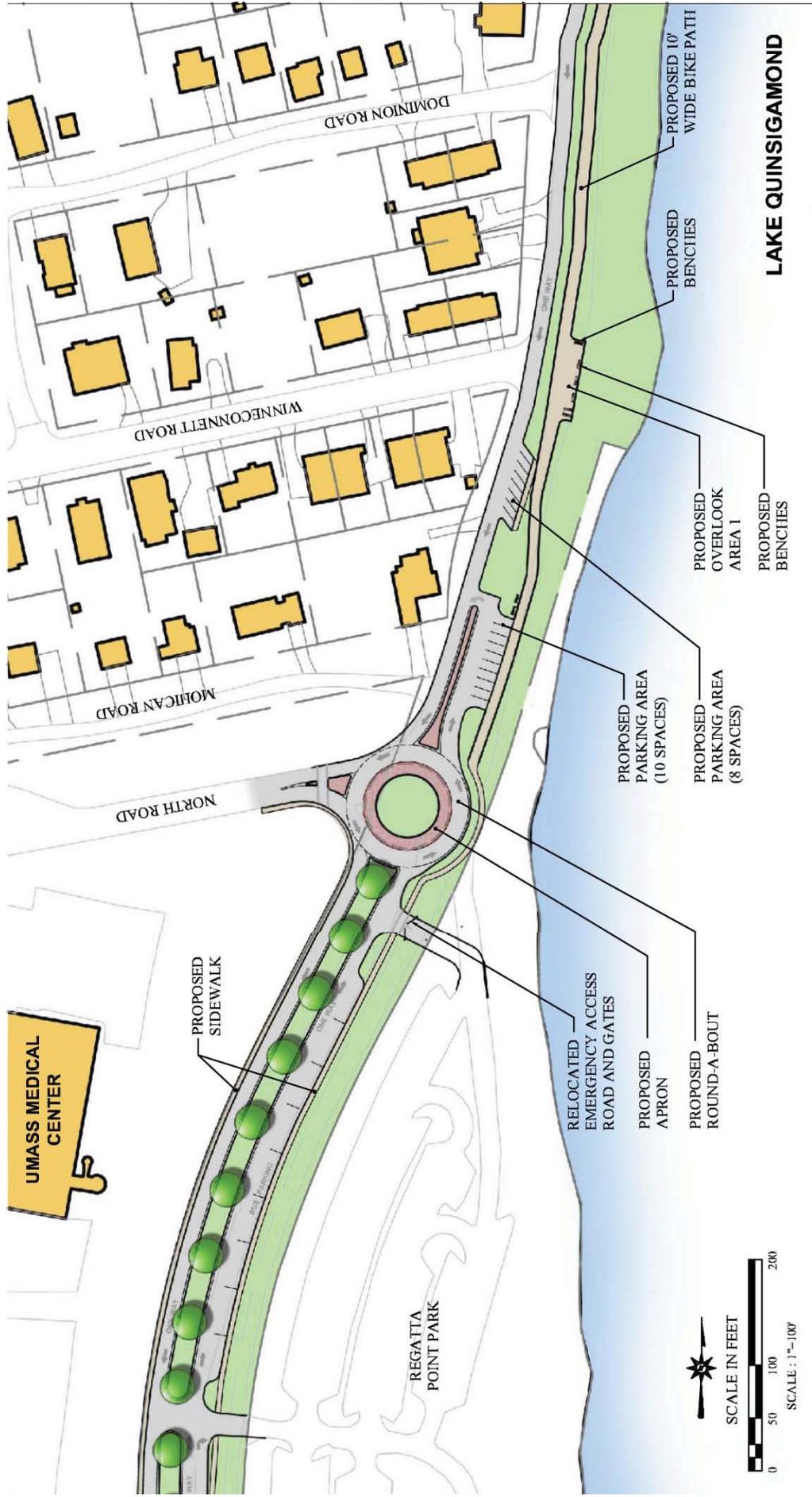
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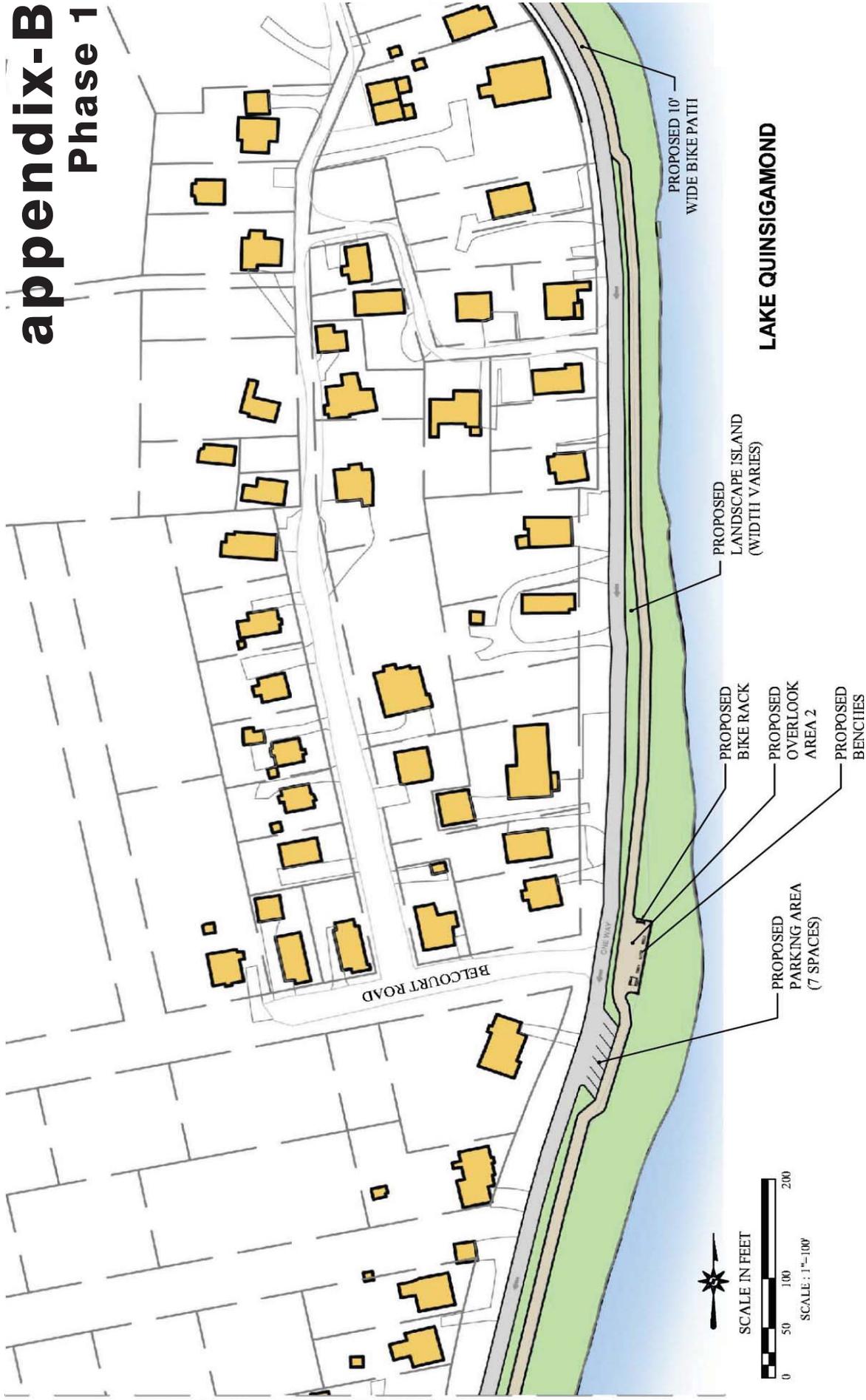
appendix-B Phase 1



appendix-B Phase 1



appendix-B Phase 1



appendix-B Phase 1



LAKE AVENUE NORTH

appendix-B Phase 1



LAKE QUINSIGAMOND MULTIPURPOSE TRAIL AND SCENIC OVERLOOK

Conceptual Design Study

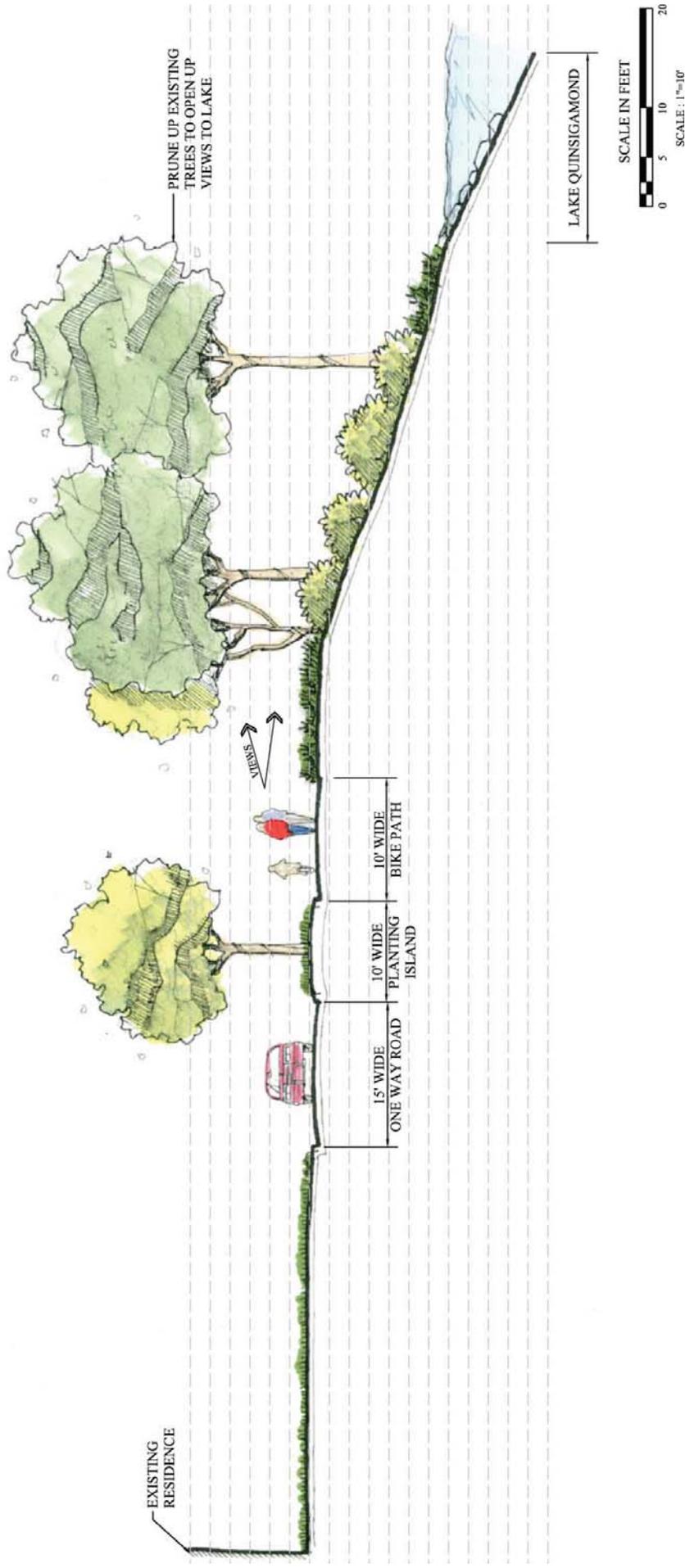
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April 2009

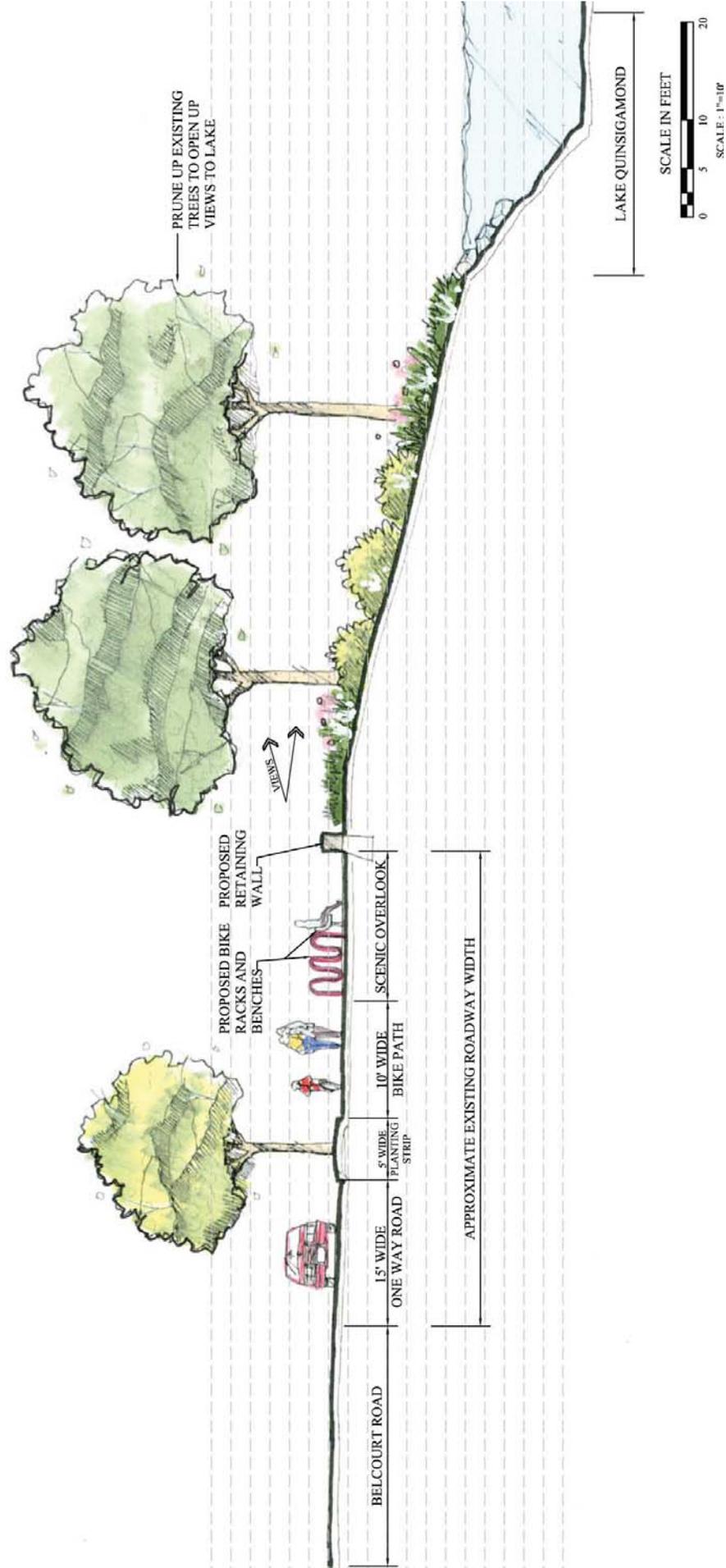


WORCESTER, MASSACHUSETTS

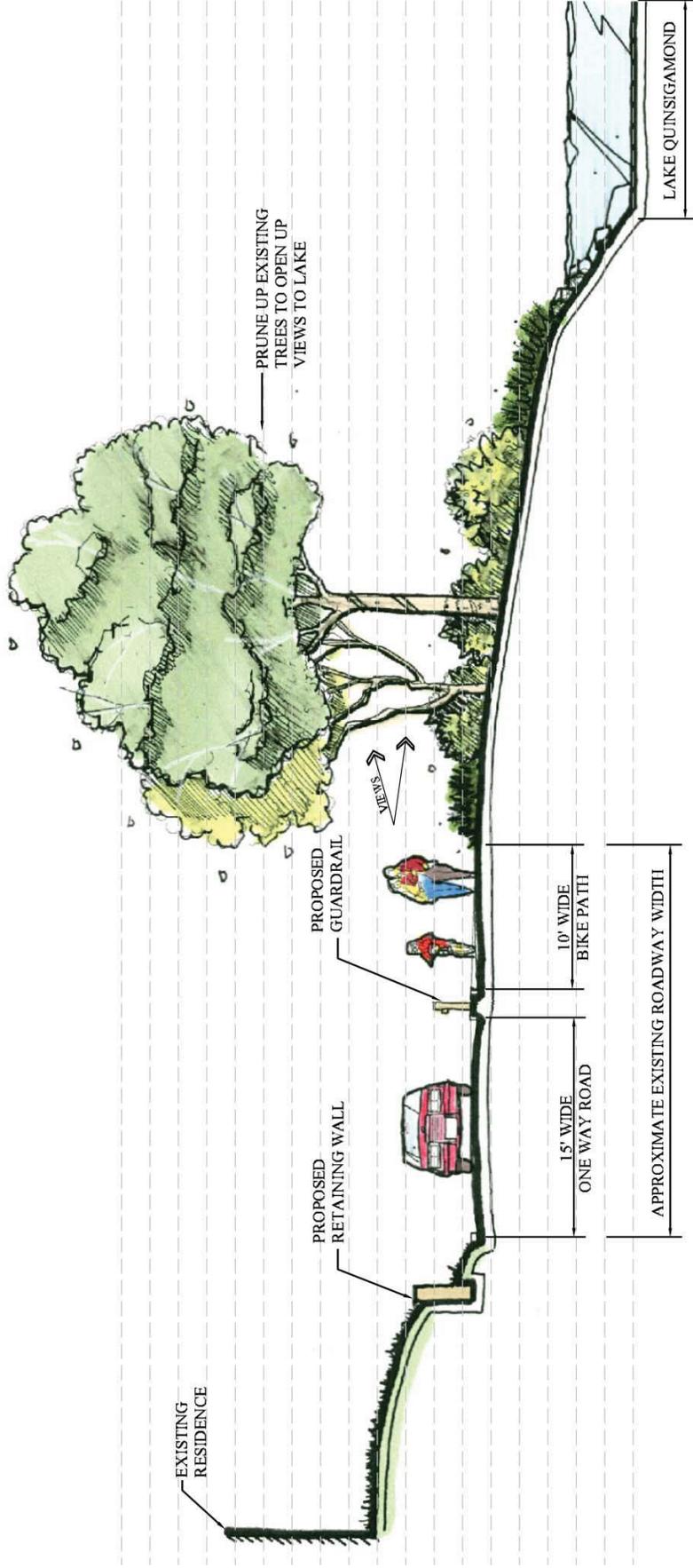
appendix-B Phase 1



appendix-B Phase 1



appendix-B Phase 1



appendix-B Phase 2

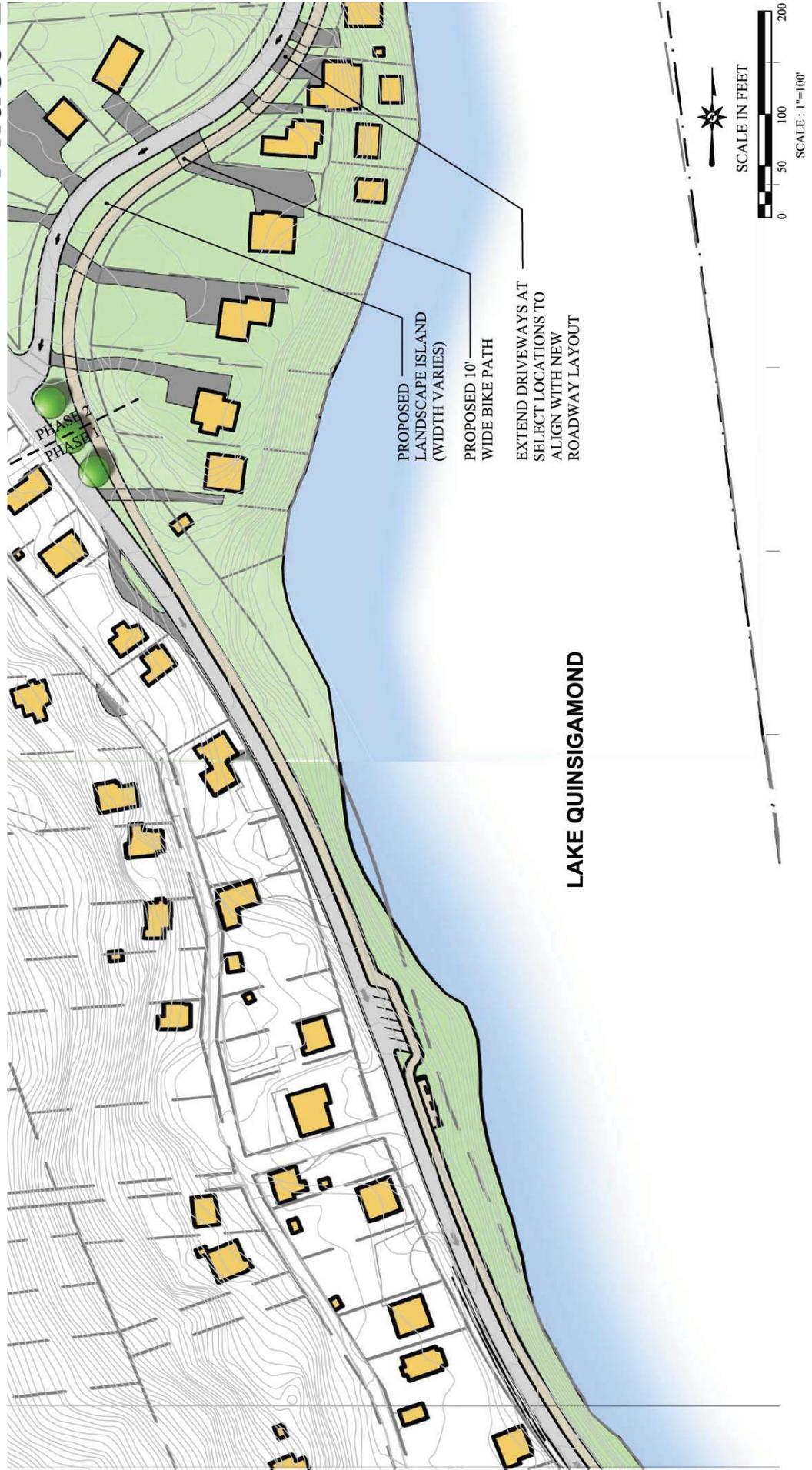
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appendix-B Phase 2



appendix-B Phase 2



appendix-B Phase 2

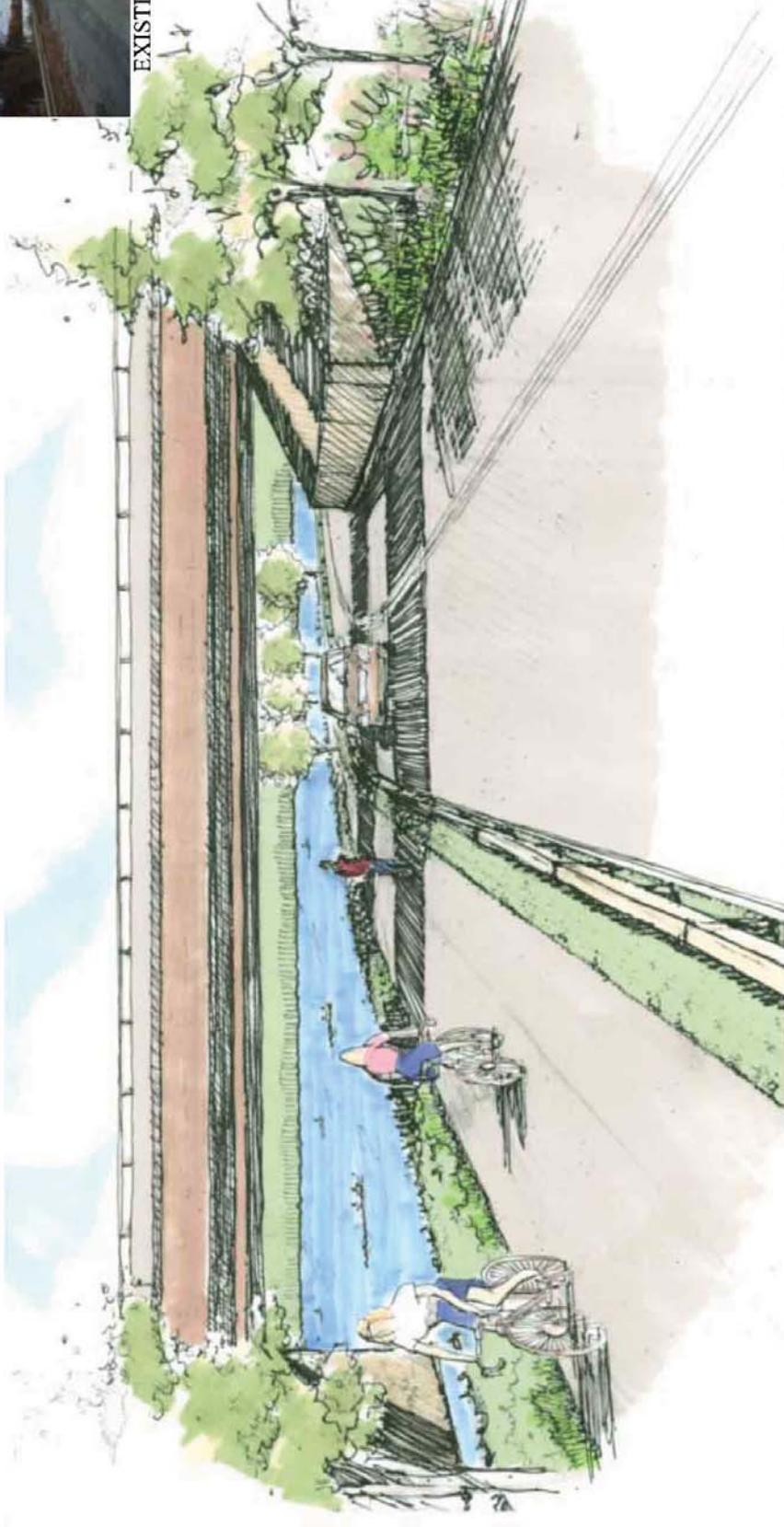


LAKE AVENUE NORTH

appendix-B Phase 2



EXISTING CONDITIONS



LAKE QUINSIGAMOND MULTIPURPOSE TRAIL AND ROADWAY IMPROVEMENTS

Conceptual Design Study

April 2009



WORCESTER, MASSACHUSETTS

REFERENCE

Mr. David Hickey
Town Engineer
20 Municipal Way
Wellesley, MA 02481
(781) 235-7600 x3315

SERVICES PROVIDED

- ✓ Planning
- ✓ Design
- ✓ Final Design
- ✓ State & Federal Permitting
- ✓ Construction Services

PROJECT STATUS

Under Construction

PROJECT BENEFITS

- ✓ Use of Composite Timber Materials
- ✓ Use of Helical Piles

KEY PERSONNEL

Randall Collins, RLA, ALSA
Kien Ho, PE, PTOE
Nathan Scoha, ASLA
Mark Gershman, PE
Todd Warzecki, PE
Peter Kotowski, EIT
Christopher Turgeon, PE
William Skerpan, Jr.

BETA is working with the Town of Wellesley on the restoration of historic Fuller Brook Park. It is Wellesley's most popular and well-used public open space, serving not only the approximately 7,500 residents who live within walking distance of it, but many more who come by car and bicycle to enjoy its scenery and recreational opportunities. This linear park, whose 23 acres stretch for 2 ½ miles through the heart of town along portions of Fuller Brook and its tributary Caroline Brook, was established by the Town just before the turn of the 20th century for the dual purpose of improving the drainage of flood-prone areas and providing parkland near the center of town.

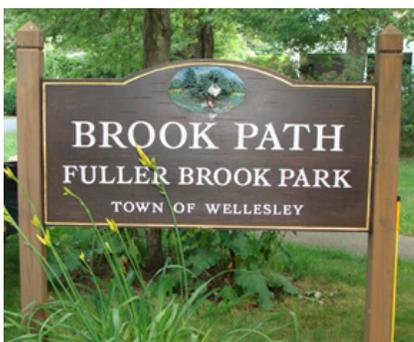
The goals of this Park Project are to preserve and enhance the naturalistic character of the Park, restore and stabilize Fuller Brook and Caroline Brook, install a more natural path while retaining most of the existing path alignment, enhance and restore views to historic bridges and other natural features, preserve/restore the existing tree community, and enhance native plant diversity and vegetation cover.

Project components include trail rehabilitation, streambank stabilization and restoration, invasive plant removal, stormwater improvements including a new wet meadow and bioretention features, wayfinding and interpretive signage, tree evaluation and protection and new plantings. BETA also designed five raised walkways to carry the path over streams, wetland and areas subject to flooding.

In addition to the preparation of construction documents BETA assisted the Town to permit this project. Regulatory agencies included the Army Corp of Engineers, the Department of Environmental Protection and the Town's Protection Committee.

To receive community approval and funding BETA lead an extensive public outreach process. Meetings included four formal public meetings, on site meeting with stakeholders and residents, and biweekly meetings with the Town's coordination committee for the two and half year duration of the design process. This effort culminated with a presentation to Town Meeting to approve funding for this 5.5 million dollar project.

BETA is currently assisting the Town during the construction phase of this project.



REFERENCE
 Mr. Richard Stinson
 Director of Public Works
 Town of Wakefield, MA
 1 Lafayette Street
 Wakefield, MA 01880
 (781) 246-6301

PROJECT STATUS
 Ongoing (Preliminary Design)

PROJECT COST
 Total \$6.3M

KEY PERSONNEL
 William McGrath, PE
 Randall Collins, RLA, ASLA



BETA is part of the team designing a 4.3 mile multi-use path along an existing abandoned rail bed beginning in Wakefield near the Galvin Middle School, extending through Lynnfield and ending at the Peabody city line. The corridor is the southern section of the former Newburyport Railroad. The project also includes on-road bicycle lanes, parking areas, safety improvements at roadway crossings and landscape enhancements. Roadway crossings include both signalized and un-signalized intersections.

The design will incorporate geometric as well as signalization improvements to enhance safety at the crossings. The trail will provide connections to numerous neighborhood, businesses and schools. A portion of the project passes through the Reedy Meadow, an Area of Critical Environmental Concern (ACEC). A 4,800 foot long elevated boardwalk is proposed through the ACEC to minimize floodplain impacts. Scenic overlooks will be included in the trail alignment at points of interest. Key design issues include stormwater management, flooding concerns, evaluation of the structural integrity of soils within the rail bed and environmental impacts. The project includes a significant public outreach and participation component.

Construction funding for the project will be through MassDOT's Transportation Improvement Program (TIP).



REFERENCE

Mr. Paul Moosey Jr., PE
Commissioner
Public Works & Parks
Department
20 East Worcester Street
Worcester MA 01604
Tel. 508-929-1300 x4150
Fax. 508-799-1458

KEY PERSONNEL

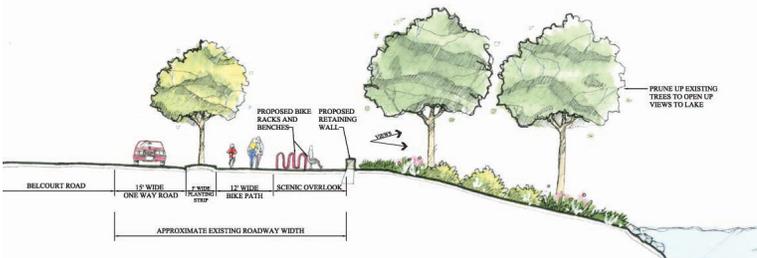
William P. McGrath, PE
Randall Collins, RLA



BETA prepared designs for the development of the linear park and multi-use trail along approximately 1.3 miles of Lake Avenue North adjacent to Lake Quinsigamond. The new design provides for improved public access and enjoyment along an underutilized section of the Lake Quinsigamond shoreline, well also improving the quality of life for residents along Lake Avenue North by mitigating negative traffic conditions.

- Conceptual and preliminary design efforts to define the preferred cross section for the path, as well as, the horizontal and vertical alignments
- Traffic study including the analysis of one-way circulation for a portion of the corridor to allow a narrower pavement and expanded footprint for the park
- Open space design including developing opportunities for overlooks and the design of a canoe/kayak launch, as well as, a potential snow sliding area and connections to the City’s East Side Trail
- Storm water management design incorporating LID methods to reduce storm water impacts to the lake and improve water quality
- Construction cost estimates
- Public Participation

The multi-use path is designed to meet the accessibility requirements of the Americans with Disabilities Act (ADA) including surface materials and grading. The design includes ADA accessible path access, ADA compliant connections to trailhead and intermediate parking areas, development of a passive recreational are with ADA compliant walking paths and development of an ADA compliant canoe/kayak launch to replace an existing boat ramp. Future elements of the project could include development of an ADA accessible ramp from the path to a public beach area.





Existing Conditions

REFERENCE

Mr. Lee Pouliot
Chicopee, MA
(413) 594-3557

PROJECT STATUS

2013-present

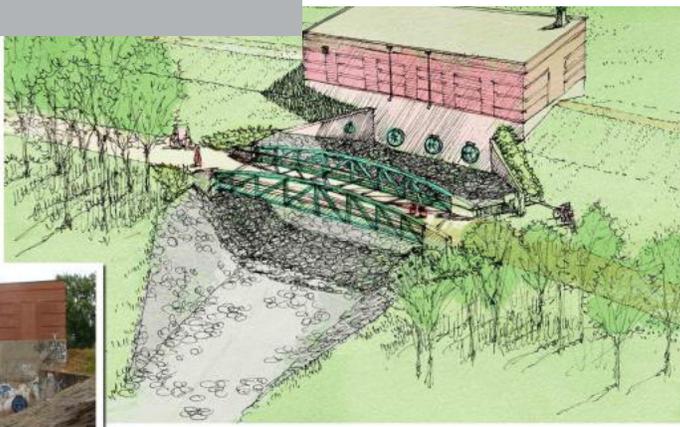
KEY PERSONNEL

Randall Collins, RLA, ASLA
William McGrath, PE

BETA is designing a multi-use path along a 2.8 mile corridor adjacent to the Connecticut River. This segment is part of a planned 20 mile corridor along the Connecticut River through Springfield, Chicopee, West Springfield and Agawam. The project is within the Chicopee flood control district and is adjacent to an existing flood control dike. Key elements of the design include the grading of the path to avoid impacts to the flood plain, connections to a state boat ramp at the southerly end and to Nash Field at the northerly end. The alignment passes over the outfall channel of a stormwater pumping station. A prefabricated bridge is proposed to carry the path across the 65 foot span. Other components include designing connections across the dike to connect with the adjacent neighborhood streets.

As with the path itself, these connections must meet Americans with Disability Act (ADA) requirements. The project will include development of overlook areas at strategic locations along the river, including an existing bald eagle's nest. Also included is the installation of interpretive signing to highlight the historic significance of the flood control system, as well as, the Connecticut River.

Construction funding for the project will be through MassDOT's Transportation Improvement Program (TIP). The project includes an extensive public outreach program.



Bird's Eye View of Multiuse Bridge



Existing Conditions

REFERENCE

Mr. Jamie Erickson
Natick Planning & Community
Development Office
(508) 647-6450

MASSDOT PROJECT MANAGER

Muazzez Readon
(857) 368-9331

SERVICES

- ✓ Trail Design
- ✓ Stormwater Management
- ✓ Bridge Design
- ✓ Permitting
- ✓ Landscape Architecture/Visioning
- ✓ Community Outreach

PROJECT STATUS

Design Ongoing

PROJECT COSTS

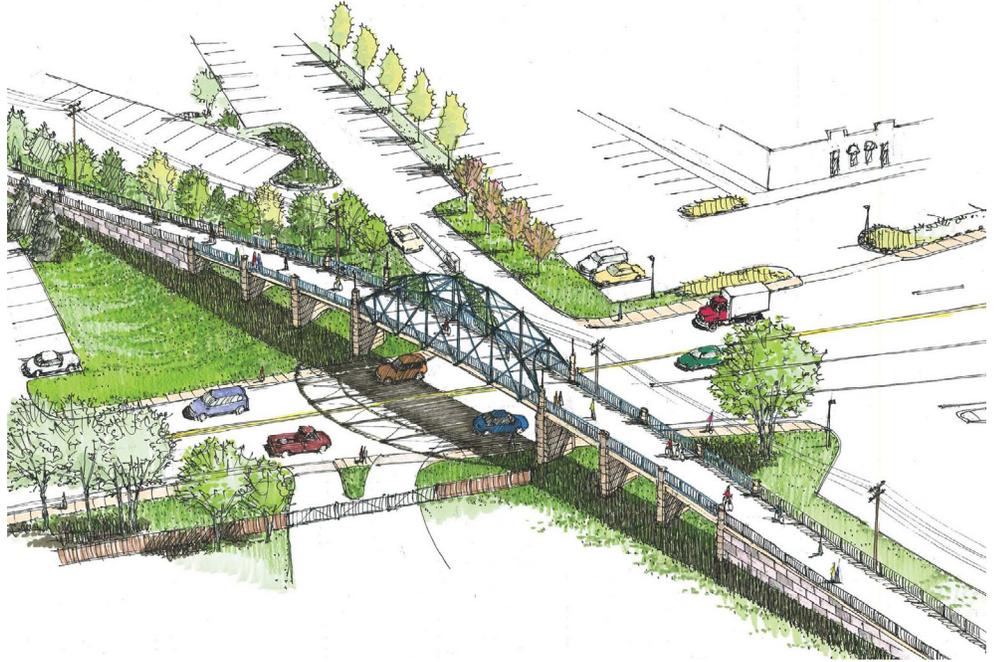
Construction Cost \$7M

PROJECT BENEFITS

- ✓ Community Enhancement
- ✓ Extend CRT from Framingham to Natick
- ✓ Connect to MBTA Rail Station
- ✓ Recreational Facility

KEY PERSONNEL

William McGrath, PE
Mark Gershman, PE
Joseph Freeman, PE
Matthew Shute, PE
Andrew Ogilvie, PE



BETA is providing design services for the Cochituate Rail Bike Trail (CRT) project in Natick, which extends from Route 30 at the Natick/Framingham Line, a distance of 2.4 miles to the MBTA Commuter Rail Station in downtown Natick. The CRT also includes a 0.25 mile spur that connects to the Natick Collections, a major retail shopping center. The trail runs adjacent to Lake Cochituate and Cochituate State Park, crosses over Route 9 on an existing railroad bridge, and continues along the Saxonville Branch railroad right of way into Natick center. This project extends the current CRT from Framingham into Natick.

The CRT includes five (5) at-grade intersection crossings, sections of new retaining walls, development of parking areas, as well as, the replacement of the former railroad bridge over Route 9 and a stone arch bridge over Lake Cochituate.

A key component of the design is the manner and treatment of the trail crossing of Route 30, a major urban arterial that defines the location where the Natick CRT meets the Framingham CRT. The CRT crosses Route 30 just north of its signalized intersection with Speen Street, which connects Route 30 to Route 9 and the Natick Collection. There are concerns that an at-grade crossing near or at the Speen Street intersection will have adverse impacts on traffic safety and operations. BETA evaluated options for the crossing including HAWK signals and grade separation alternatives as shown in the rendering above. Following discussions with MassDOT and the Town, it was determined that the bridge option is the most viable. BETA is advancing design of the bridge.

The trail is being designed to meet the accessibility requirements of the Americans with Disabilities Act (ADA).



REFERENCES

Mr. Matthew Varrell, PWS
Conservation Director
500 Dedham Avenue
Needham, MA 02492
781-455-7550

Ms. Patricia Carey, CPRP
Park and Recreation Director
500 Dedham Avenue
Needham, MA 02492
781-455-7550

SERVICES PROVIDED

- ✓ Community Outreach
- ✓ Survey
- ✓ Wetlands Delineation
- ✓ Trail Layout and Design
- ✓ Well Removal and Closure
- ✓ Permitting

PROJECT STATUS

Design Ongoing

PROJECT COSTS

Construction Cost \$900,000

PROJECT BENEFITS

- ✓ Accessible Trail
- ✓ Enhancements for Visually Impaired

KEY PERSONNEL

Kelly Carr, RLA, ASLA
Scott Ridder, RLA, ASLA, LEED AP
Robert Mackie, PE, BCEE
Michael Hornig, PE



There is an existing unimproved trail around much of the existing reservoir off Dedham Street in Needham. The trail is narrow with uneven terrain, many roots, and some advancing undergrowth. The trail abuts and goes through wetland areas. Much of the trail was created for the construction of two drinking water wells back in the early 1900's, which have since been decommissioned. The reservoir supports various recreational interests including, fishing, model boat racing, walking, and ice skating.

The project is about mobility and creating a trail that is accessible to all ages and abilities. The main goal of the project is to provide a continuous ADA accessible trail usable by all residents with access to the water's edge.

The design includes a 6 foot wide continuous trail constructed of firm and stable materials including, concrete, dense graded stone, and wooden boardwalks. A bridge is being designed to cross the existing spillway which will provide the needed continual loop. A fishing platform will be provided at the wedge of the reservoir and benches will be placed at strategic locations to provide comfortable resting areas with views of the surrounding wetlands. Alterations will be made to the existing parking lot at the Public Services Administration Building to support this new use.





REFERENCES
Lambri Zerva, P.E.
RIDOT

Bonnie Nickerson
Providence Planning Department

Robert McMahon
Providence Parks Department

PROJECT STATUS
Design: 2012 to present
Construction: 2016-2017

KEY PERSONNEL
Kelly Carr, RLA, ASLA
Amanda Sloan, RLA, ASLA
Scott Ridder, RLA
Domini Cunningham, MLA, MCP



BETA has been involved directly with the relocation of I-195 for the past 4 years and two project managers have worked on both the I-195 Relocation and the River Relocation project for over 20 years. The focus of our work was and continues to be a series of parks, multi-use trails and new streetscapes. As a member of a multidisciplinary team, BETA is responsible for all riverfront treatments of the East and West Parks, pedestrian bridge landings and the design of the East Park. Construction is scheduled to start in 2016.

Park elements include native landscaping, rain gardens, sustainable design, salt marsh restoration, urban meadow, ADA access, boardwalk, shared use path, passive play elements, pergola, seating areas, interpretive elements, riverwalls and a kayak landing.



Washington Pedestrian Bridge/George Redman Linear Park

Providence, East Providence, Rhode Island

REFERENCE

David Fish, PE
Acting Chief Engineer
Two Capitol Hill
Providence, RI 02903
401-222-2053
David.fish@dot.ri.gov

SERVICES PROVIDED

- ✓ Planning
- ✓ Design
- ✓ Construction Administration
- ✓ Sustainability
- ✓ Historic Preservation
- ✓ Bike Path

PROJECT STATUS

Completed 2016

PRIME CONSULTANT

VHB, Bharat Patel, PE

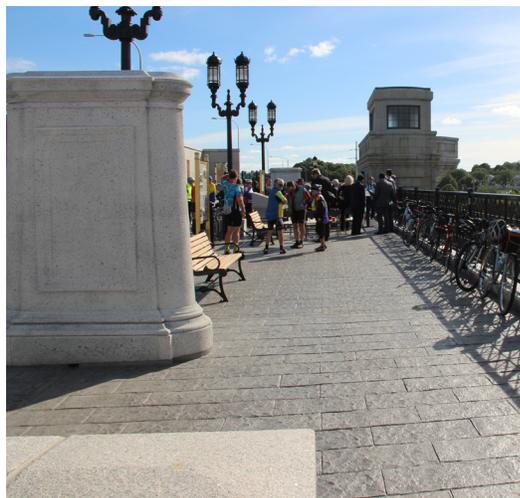
KEY BETA PERSONNEL

Kelly Carr, ASLA
Deb Howard



Listed on the National Register of Historic Places, the Washington Bridge, once a city street connector and interstate highway carrier, is now a preserved landmark and vital link in the region's growing bike path, pedestrian way and park system. The design and geographical location promote the attraction of thousands of bicycle commuters and recreational users as it supports health, educational and economic growth and sustainability.

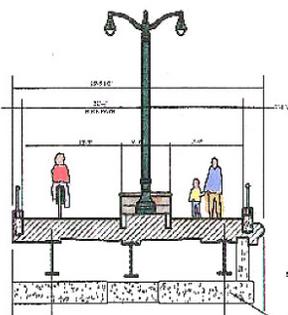
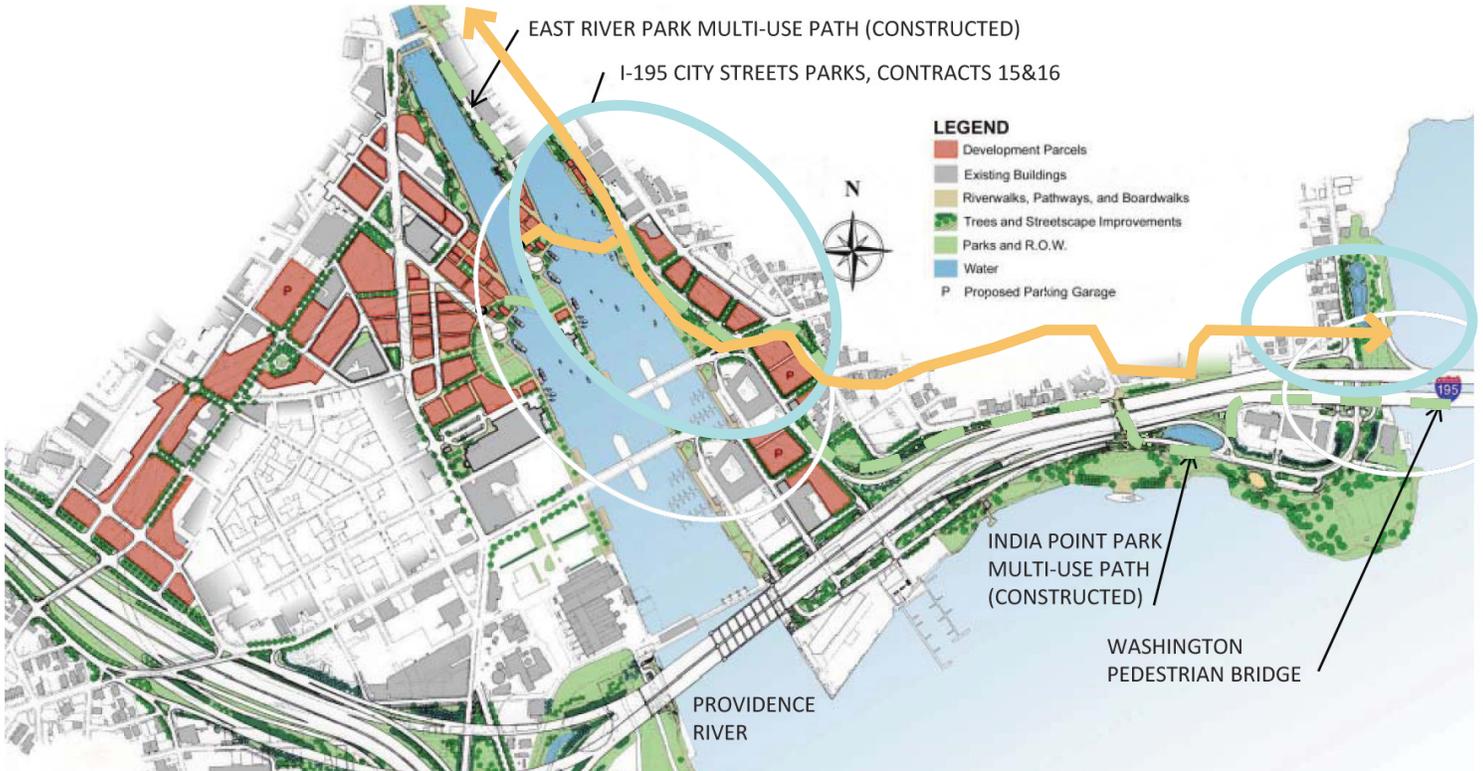
The project scope was to preserve and rehabilitate the south side of the historic landmark while transforming the existing narrow access path into a seven foot wide pedestrian walkway with an eleven to twelve foot wide bike path separated by a five foot median. Adjacent to the operator's house in the middle of the bridge would be a fourteen by forty foot overlook plaza to serve as a stopping point for pedestrians and cyclists.



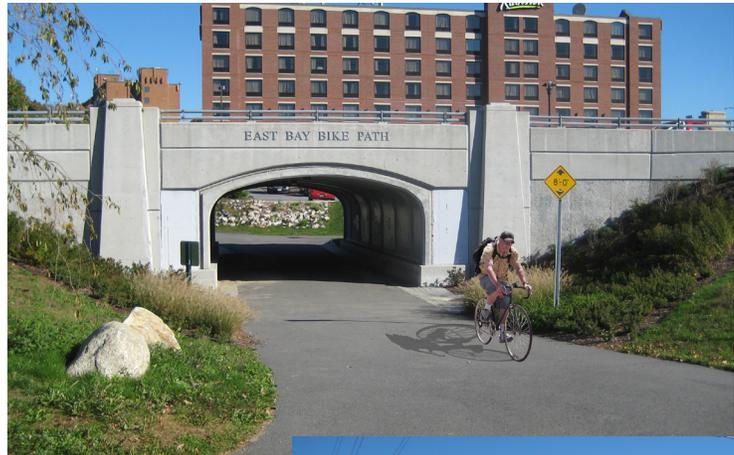
Washington Pedestrian Bridge & I-195 Relocation Shared Use Path - Providence, Rhode Island

KEY PERSONNEL
Kelly Carr, ASLA

Both projects incorporate shared use paths, bike paths, and bike lanes and serve as links in the Rhode Island Department of Transportation's "Bike Rhode Island" plan. Washington Bridge began construction in the spring of 2012. Route 195 relocation contracts are scheduled to begin in 2013 and 2014.



Washington Pedestrian Bridge



Bike Path



REFERENCE

Mary Trudeau
 Conservation Commissioner
 19 Moore Street
 Belmont, MA 02478
 617-933-2667
 mtrudeau@belmont-ma.gov

SERVICES PROVIDED

- ✓ Conceptual Design Options
- ✓ Community Outreach
- ✓ Site Analysis

PROJECT SIZE

21 Acres

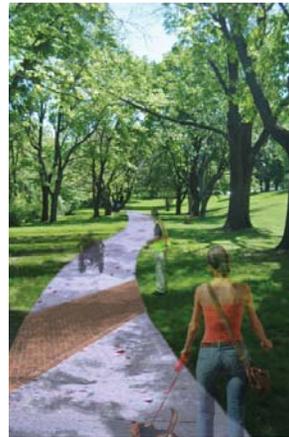
PROJECT COSTS

\$20,000

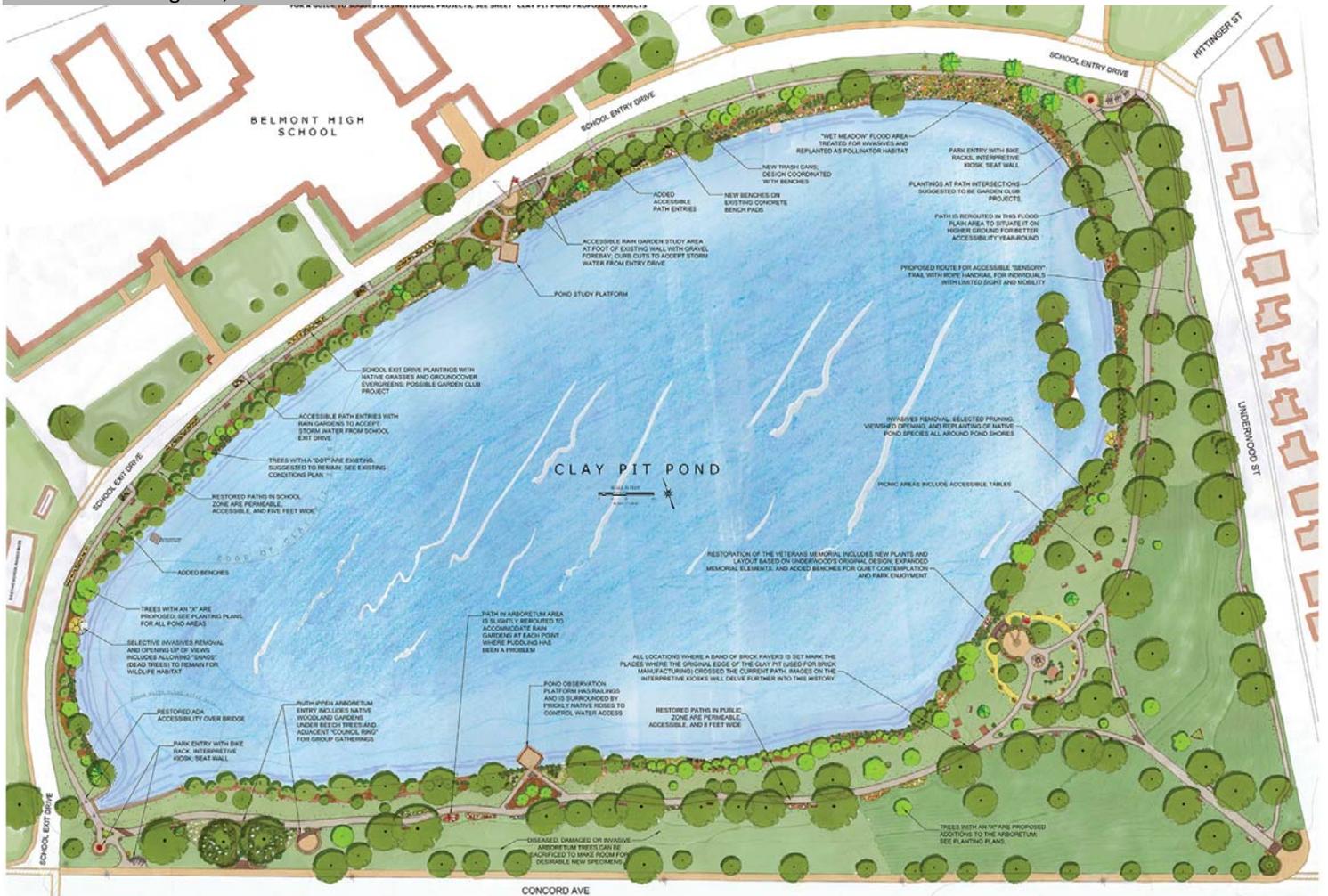
KEY PERSONNEL

Donald Leighton, RLA, ASLA
 Amanda Sloan, ASLA
 Scott Ridder, RLA
 Domini Cunningham, ASLA

The BETA team, including landscape architects and a storm water engineer, was hired by the town of Belmont to provide a master plan for the park surrounding Clay Pit Pond, a recreational and habitat site that is also part of the town's storm water system. Of particular need was rerouting and making permeable the worn walking path. BETA gathered current and historic information through public and community records and community design meetings. Analysis of the site's past and existing conditions helped them develop programs for specific zones surrounding the pond, including an improved permeable path, invasive plant management, native plant restoration, pond overlook stations, information kiosks, bench locations, rain gardens, and an update to the existing Veterans Memorial.

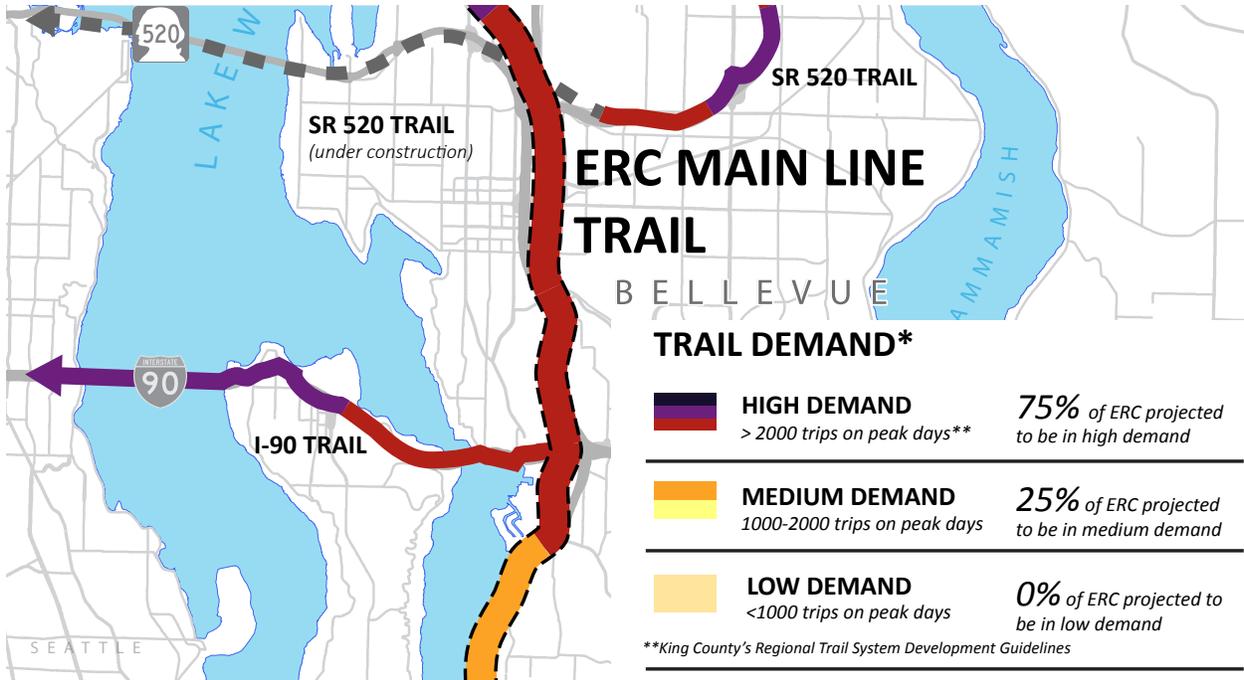


to the existing Veterans Memorial. A comprehensive, sequenced plan was presented to the town so that civic and volunteer groups can tackle individual dovetailed projects to make an improved park a reality.





Seattle, WA Eastside Rail Corridor Trail Master Plan



The King County Eastside Rail Corridor (ERC) Master Plan Project is the first phase in the development of a 17-mile regional trail along former rail line. Toole Design Group (TDG) worked within a larger interdisciplinary team, to evaluate the feasibility of construction regional trail connections at five locations: Renton, I-90, Bellevue, 520, and Woodinville.

This included conducting field assessments, analyzing and evaluating connection alternatives, developing planning-level cost estimates, completing a detailed demand analysis, and developing corridor-specific design guidelines. TDG engaged local jurisdictions and the Washington State Department of Transportation on developing and evaluations potential connections.

Client

King County Parks, Department of
Natural Resources and Parks
Erica Jacobs, MPA, PMP, Project Manager
206.477.5539
erica.jacobs@kingcounty.gov



Washington, DC Metropolitan Branch Trail Phase II



Toole Design Group (TDG) has a long and on-going history planning and designing the Metropolitan Branch Trail (MBT). This 8-mile trail runs from Union Station in the District to Silver Spring, MD, traversing numerous vibrant and historic neighborhoods. It is an important transportation route providing connections to seven metro stations and the National Mall. TDG has played a major role in every phase of the project since its inception including:

- development of the original master plan and subsequent plans;
- decade of public outreach and intensive field study;
- coordination with a variety of public and private stakeholders and agencies including National Park Service (NPS), Washington Metropolitan Area Transit Authority (WMATA), advocacy and community groups;
- design of facilities and trail segments; and
- the development of an on-going implementation plan.

TDG is currently working on Phase II of the trail and is tasked with producing 30% construction plans for the final four segments of the trail north of Fort Totten and running through Takoma, DC.

TDG's responsibilities include providing comprehensive trail design and planning based on our knowledge, history, and national trail design expertise. This will include planting plans and tree preservation; stormwater management; horizontal and vertical trail alignment; and a complete construction detail package.

A portion of the trail will be within the District Department of Transportation's (DDOT) right-of-way and will include lane diets and the removal of parking, curb bump outs, this is no small feat given the limited amount of space to work with in some areas.

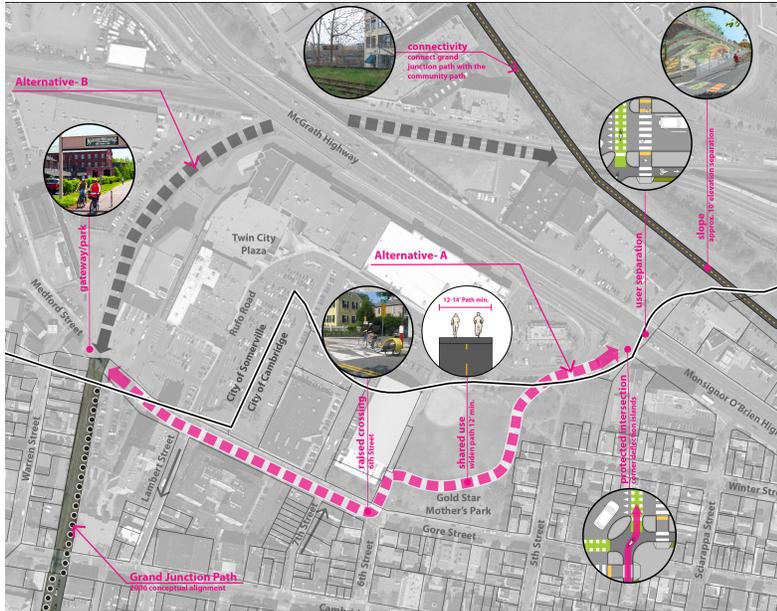
Phase II will result in the completion of the north/south multimodal connection, providing users a much anticipated, protected route from the existing trail segments to the Maryland/DC border.

Client

District Department of Transportation
Mike Goodno, Bicycle Program Specialist
2000 14th Street NW, 7th Floor
Washington, DC 20009
202.671.0681
mike.goodno@dc.gov



Cambridge, MA Closing the Gap on the Grand Junction Path



Toole Design Group (TDG) is the lead urban designer for the feasibility analysis and conceptual design of three (3) physical improvement projects along the Grand Junction Path in Cambridge, MA. The Grand Junction corridor is an existing railroad right-of-way through the City of Cambridge. This study will build upon previous TDG work and propose to fill gaps for the current conceptual design. John is working

closely with the Friends of the Grand Junction Path, LivableStreets Alliance, City of Cambridge, Cambridge Redevelopment Authority, and MIT to analyze and propose conceptual design recommendations to complete sections of the proposed linear path. He is also incorporating site specific amenities to integrate the facility with the surrounding communities.

Client

LivableStreets Alliance

Amber Christoffersen, Project Manager

70 Pacific Street

Cambridge, MA 02139

617.621.1746

amber@livablestreets.info

Section 4 – References

Client References

There is no better benchmark on the quality of services provided by our staff than feedback and testimonials from our clients. BETA is pleased to provide the following list of references for your consultation. Those listed can speak to BETA's professionalism, technical expertise and responsiveness. (Telephone numbers have been recently verified).

Mr. Geoff Lewis

Community and Economic Development

Town of Natick

13 East Central Street

Natick, MA, 01760

T: 508.647.6451

glewis@natickma.org

(Cochituate Rail Trail project town contact)

Mr. Joshua Ostroff

Chair, Cochituate Rail Trail Committee

Town of Natick

13 East Central Street

Natick, MA 01760

T: 508-654-3330

joshua@ostroff.net

(Cochituate Rail Trail project committee)

Mr. Richard Merson, PE

Town of Needham

DPW Director

500 Dedham Avenue

Needham, MA 02492

781-455-7550 x318

rmerson@needhamma.gov

(Needham ADA Trail Downtown

Streetscape project town contact)

Mr. Thomas M. Jacob

Chairman

67 Clarke Rd

Needham, MA 02492

(781) 235-1357

tmjacob@comcast.net

(Needham ADA Trail Downtown

Streetscape project working group:

Meetings every two weeks for one year)

Mr. David Hickey

Town Engineer

20 Municipal Way

Wellesley, MA 02481

(781) 235-7600 x3315

dhickey@wellesleyma.gov

(Fuller Brook project town contact)

Mr. Paul Criswell

(contact through Wellesley DPW)

20 Municipal Way

Wellesley, MA 02481

(781) 235-7600

pcriswell@wellesleyma.gov

(Fuller Brook project committee)

Section 5 – Capacity

Capacity

We have structured a team that provides the Town of Belmont with specialized experience and resources. BETA and our subconsultants will commit our resources to the Town to ensure successful and on-time deliverables. Presently, we have a number of similar assignments that will either be completed or well underway by the time we would begin the proposed project(s). Therefore, we can expertly predict our project schedules. Consequently, we can make the statement that individually and collectively BETA's project team has the capacity to complete this project in a manner and timeframe that meets your project objectives.

Conflicts of Interest

BETA does not have any potential conflicts of interest or affiliations with groups or persons that have an interest in this community path project.

APPENDIX D

REQUEST FOR PROPOSALS

BELMONT COMMUNITY PATH FEASIBILITY STUDY

CERTIFICATION OF NON-COLLUSION

The undersigned certifies under penalties of perjury that this proposal has been made and submitted in good faith and without collusion or fraud with any other person. As used in this certification, the word "person" shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

4/21/16
Date

BETA Group, Inc.
Name of Entity submitting bid, whether individual, partnership, corporation, joint venture or other business or legal entity.

Corporation
Type of Entity

315 Norwood Park South, 2nd Floor
Address
Norwood, MA 02062

781-255-1982
Telephone

By Frank J. Thomas
Authorized signature of entity submitting proposal
President
Signer's duly authorized position, office or title

APPENDIX E
REQUEST FOR PROPOSALS
BELMONT COMMUNITY PATH FEASIBILITY STUDY
STATEMENT OF TAX COMPLIANCE

Pursuant to M.G.L. Chapter 62c, Section 49A, I certify under the penalties of perjury that this firm, to the best knowledge and belief, has filed all State Tax returns and paid all State Taxes required under law.

05-0398907
Federal Identification Tax Number

BETA Group, Inc.
Name of Entity submitting bid, whether individual, partnership, corporation, joint venture or other business or legal entity.

Corporation
Type of Entity

315 Norwood Park South, 2nd Floor
Address
Norwood, MA 02062

781-255-1982
Telephone

By Frank J. Romeo
Authorized signature of entity submitting proposal
President
Signer's duly authorized position, office or title



Charles D. Baker, Governor
 Karyn E. Polito, Lieutenant Governor
 Stephanie Pollack, Secretary & CEO
 Thomas J. Tinlin, Administrator



Architects and Engineers Review Board - Prequalification

Effective: February 26, 2016

Expires: February 25, 2018

Beta Group, Incorporated
 315 Norwood Park South
 Norwood MA 02062

You are Prequalified in the following Disciplines:

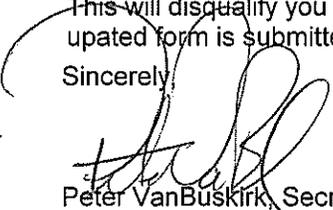
- | | |
|---|--|
| <input checked="" type="checkbox"/> Major Environmental Documentation | <input checked="" type="checkbox"/> Transportation Planning |
| <input checked="" type="checkbox"/> Basic Roadway Design | <input checked="" type="checkbox"/> Intelligent Transportation Systems |
| <input checked="" type="checkbox"/> Intermediate Roadway Design | <input type="checkbox"/> Transit and Rail Systems Design |
| <input checked="" type="checkbox"/> Complex Roadway Design | <input checked="" type="checkbox"/> Subsurface Utility Engineering |
| <input checked="" type="checkbox"/> Basic Bridge Design/Rating | <input checked="" type="checkbox"/> Value Engineering |
| <input checked="" type="checkbox"/> Intermediate Bridge Design/Rating | <input type="checkbox"/> Cultural Resources |
| <input type="checkbox"/> Complex Bridge Design/Rating | <input checked="" type="checkbox"/> Hazardous Waste - Site Investigation and |
| <input checked="" type="checkbox"/> NBIS Bridge Inspection | <input checked="" type="checkbox"/> Hazardous Waste - Remediation |
| <input type="checkbox"/> Moveable Bridge Design/Rating | <input checked="" type="checkbox"/> Wetlands - Delineation and Assessment |
| <input type="checkbox"/> Moveable Bridge Inspection | <input checked="" type="checkbox"/> Wetlands - Mitigation |
| <input checked="" type="checkbox"/> Traffic Operations Studies and Design | <input checked="" type="checkbox"/> Water Quality - Assessment |
| <input type="checkbox"/> Geotechnical Engineering Including
Soils and Foundation Studies | <input checked="" type="checkbox"/> Water Quality - Mitigation |
| <input checked="" type="checkbox"/> Construction Oversight | <input type="checkbox"/> Air Quality |
| <input type="checkbox"/> Construction Contract Assistance | <input type="checkbox"/> Noise Studies |
| <input checked="" type="checkbox"/> Hydraulics and Hydrology | <input checked="" type="checkbox"/> Engineering Field Survey |
| <input type="checkbox"/> Materials Inspection and Testing | <input checked="" type="checkbox"/> Total Station AutoCAD Base Plan Services |
| <input type="checkbox"/> Architecture | <input checked="" type="checkbox"/> Layout Document Preparation |
| <input checked="" type="checkbox"/> Landscape Architecture | <input type="checkbox"/> Photogrammetry |

MassHighway will retain this rating on its list of prequalified firms until the Expiration Date shown above. Your firm is required to submit a new or updated ADM-016 Form on or before the Expiration Date if you wish to continue to be considered for new services by the Department. Revised ADM-016 Forms may also be submitted at any time prior to the Expiration Date.

Failure to furnish an updated ADM-016 Form prior to the Expiration Date will result in your firm being removed from the Department's approved list.

This will disqualify you from being selected for new services by the Department until an updated form is submitted and the A&E Board has issued a new rating.

Sincerely,


 Peter VanBuskirk, Secretary
 Architects & Engineers Review Board