

2020 AMERICAN PUBLIC WORKS ASSOCIATION

PUBLIC WORKS PROJECT OF THE YEAR SMALL CITIES/RURAL COMMUNITIES

TRANSPORTATION

THE BRUCE FREEMAN RAIL TRAIL

CONCORD, MA



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2020

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March 2, 2020

Awards Committee
American Public Works Association
1200 Main Street, Suite 1400
Kansas City, MO 64105

RE: Nomination – 2020 Project of the Year Award
Small Cities/Rural Communities - Transportation
Bruce Freeman Rail Trail
Concord, Massachusetts

Dear Committee Members:

The New England Chapter of the American Public Works Association is pleased to support the nomination of the Bruce Freeman Rail Trail for the 2020 Public Works Project of the Year Award Small Cities / Rural Communities in the Transportation category.

Named for the state representative from Chelmsford that championed its development, the Bruce Freeman Rail Trail is envisioned to extend nearly 25-miles from Lowell to Framingham along the former Penn Central railroad line. The trail connects communities with local open space areas including meadows, woodlands, ponds, historical sites and shopping areas as well as alternative transportation methods like the MBTA Commuter Rail Station in West Concord Center.

The corridor is split into several segments with the most recent completion of 2.8 miles in Concord, MA as Phase 2C. This project included the construction of a steel truss pedestrian bridge structure over the Assabet River, rehabilitation of the existing railroad bridge over the Nashoba Brook and a new tunnel under Powder Mill Road. Phase 2C also includes an at-grade crossing of the commuter rail tracks to provide a safe, signalized crossing in a busy downtown area.

The Bruce Freeman Rail Trail multi-use path is an impressive example of ingenuity, design excellence and "complete Streets" and multi-modal initiatives. Accordingly, the New England Chapter supports the nomination of the Bruce Freeman Rail Trail for the 2020 Public Works Project of the Year Award Small Cities / Rural Communities in the Transportation category.

Sincerely,

Richard J. Barrett, Jr.
President

PUBLIC WORKS PROJECT OF THE YEAR AWARD SMALL CITIES/RURAL COMMUNITIES NOMINATION FORM

Deadline March 2, 2020
(electronic submittals only)

Project Name

Project Completion Date

Must be substantially completed (90%) and available for public use as of December 31, 2019.

Public Agency

City or County Population *Must be 75,000 or less.*

Project Category

- Structures
- Transportation
- Environment
- Historical Restoration/Preservation
- Disaster or Emergency Construction/Repair

Managing Agency

Name

Title

Agency/Organization

Address (if post office box, include street address)

City

State/Province

Zip/Postal Code

Phone

E-mail

Primary Contractor

Name

Title

Agency/Organization

Address (if post office box, include street address)

City

State/Province

Zip-Postal Code

Phone

E-mail

Primary Consultant

Name

Title

Agency/Organization

Address (if post office box, include street address)

City

State/Province

Zip/Postal Code

Phone

E-mail

Continued...

PUBLIC WORKS PROJECT OF THE YEAR AWARD SMALL CITIES/RURAL COMMUNITIES SUPPORTING DATA FORM

Please address each of the following areas in your nomination, adhering to the sequence below when possible.

- Development of the project to meet a perceived need of the community
- Use of alternative materials, practices, or funding that demonstrates a commitment to sustainability.
- Unique or unusual accomplishments under adverse conditions that dictated the defined action.
- Economic challenges that the community faced and the rationale of the option chosen.
- Creative use of municipal resources, equipment, labor, or funds that produced measurable benefits to the community.
- Construction processes that minimize the impact to the community and its residents during construction.
- Demonstrate awareness of opportunities for environmental preservation during the project and how they were incorporated in the project design and construction.
- Additional conditions deemed of importance to the public works agency, such as exceptional efforts to maintain quality control and, if value engineering is used, construction innovations as evidenced by time and/or money-saving techniques developed and/or successfully utilized.

NOTE: Supporting documentation is **limited to 20 pages**, exclusive of photographs and nomination form. Photographs will be used for promotional purposes by the association. Submittal should include nomination form and supporting documentation form, and photographs. Simultaneous nomination of the same project in two categories is not permitted. Nominations not chosen in a specific year for the Public Works Project of the Year Award or the Public Works Project of the Year – Small Cities/Rural Communities Award cannot be resubmitted in a subsequent year in the other category.

Nominated by: *(Can only be nominated by managing public agency or APWA chapters.)* Projects that involve or reside within two or more chapters locations can be co-nominated. Each chapter will receive credit to submit a PACE nomination. All chapters must be identified on the nomination form and before the nominations are judged.

Name

Title

Agency/Organization

Address (if post office box, include street address)

City

State/Province

Zip/Postal Code

Phone

E-mail

If chapter nominated or co-nominated list chapter(s) here:

Chapter

Chapter

The Bruce Freeman Rail Trail

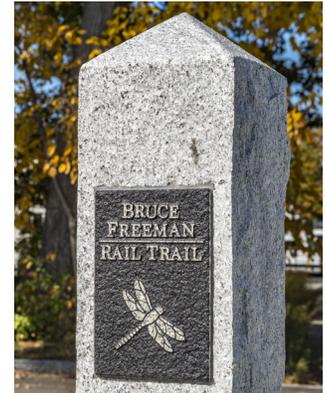
SMALL CITIES/RURAL COMMUNITIES TRANSPORTATION

Managing Agency: Town of Concord

Primary Contractor: D.W. White Construction, Inc.

Primary Consultant: Greenman-Pedersen, Inc.

Nominated By: New England Chapter



INTRODUCTION

Named for the state representative from Chelmsford that championed its development, the Bruce Freeman Rail Trail is envisioned to extend nearly 25-miles from Lowell to Framingham along the former Penn Central railroad line. The trail connects communities with local open space and recreational areas including meadows, woodlands, ponds, and playing fields in addition to historical sites, schools and shopping areas. The trail also provides access to alternative transportation methods like the MBTA Commuter Rail Station in West Concord Center.

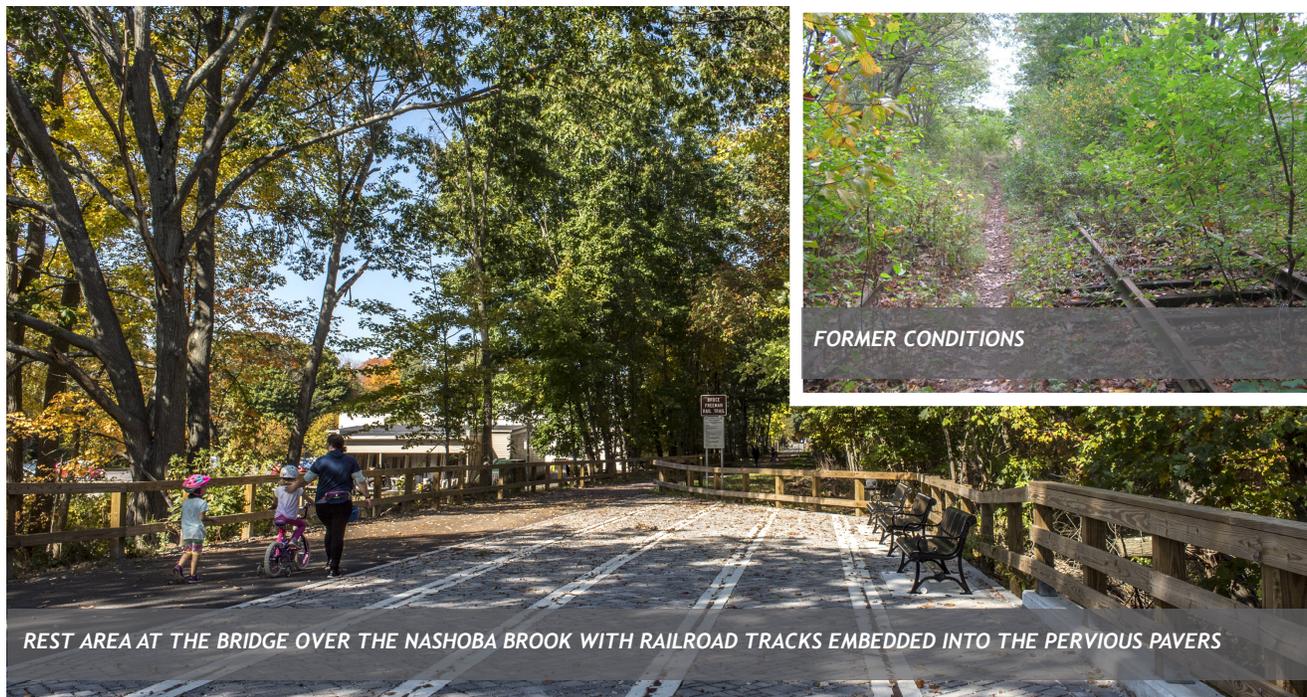
The corridor is split into several segments with the most recent completion of 2.8 miles in Concord, MA as Phase 2C. This project included construction of a steel truss pedestrian bridge structure over the Assabet River, rehabilitation of the existing railroad bridge over the Nashoba Brook and a new tunnel under Powder Mill Road. Phase 2C also included an at-grade crossing of the commuter rail tracks to provide a safe, signalized crossing in a busy downtown area.

Project Team:

- **Town of Concord:**
 - BFRT Advisory Committee (comprised of residents)
 - Department of Planning & Land Management (including Planning Division and Natural Resources Division)
 - Concord Public Works Department (including Engineering Division)
- **Greenman-Pedersen, Inc.: Lead Design Engineer**
 - Nover-Armstrong, Inc. - Subconsultant
 - Nobis Engineering, Inc.- Subconsultant
- **HNTB Corporation: Railroad Crossing Design Engineer**
- **Massachusetts Department of Transportation (MassDOT)**
- **D.W. White Construction, Inc.**
- **Massachusetts Bay Transportation Authority (MBTA)**
 - Keolis Commuter Services - MBTA Contractor



REST AREA AT THE BRIDGE OVER THE ASSABET RIVER



“ Design and construction of the rail trail were included in the Transportation section of the 2005 Comprehensive Long Range Plan - “A Vision for 2020” and in subsequent Open Space and Recreation Plans for Concord as a way of building community connections. ”

COMMUNITY NEED

Criteria 1: Development of the project to meet a perceived need of the community.

After the first official meeting to discuss a recreation trail in June 1985, State Representative Bruce N. Freeman championed the cause of creating a trail from Lowell to Sudbury in the State Legislature during 1985 and 1986. Upon Bruce Freeman’s passing from cancer in 1986, Carol C. Cleven was elected to his vacated seat in the legislature. In her first speech to the Massachusetts House of Representatives in 1987, she introduced a bill creating a bike path in his honor, as a lasting memorial to his service to Chelmsford and the State. In April 1989, H.1455 was signed into law by Gov. Michael Dukakis. A feasibility study was completed in 1987.

In 2002, Concord residents interested in moving forward with development of a rail trail formed the ‘Friends of the Bruce Freeman Rail Trail’ and began educating, promoting, and fundraising toward this effort. The Friends of the Bruce Freeman Rail Trail (Friends) were listed as a public charity under IRS regulations and have been instrumental in pushing the trail forward with efforts including outreach/communication, educating the public, and arguably most importantly, funding. In 2004, the Friends provided \$25,000, and the planning division sought a grant from the “Bikes Belong” Coalition of an additional \$5,000 to fund an environmental and engineering assessment. Design and construction of the rail trail were included in the transportation section of the 2005 Comprehensive Long Range Plan – “A Vision for 2020” and in subsequent Open Space and Recreation Plans for Concord as a way of building community connections.

After the successful fund-raising efforts and completion of the environmental and engineering assessment, the Friends then went on to prepare a successful application to the Community Preservation Committee to access design funds toward the 25% design, which was approved by the 2006 Annual Town Meeting.

Fast forward 20 years after the passing of Sen. Freeman and the people of Concord are reviewing a 25% design for a Rails-to-Trails project through the Town. The effort that went into those plans was appreciated, but it was apparent that there was a significant amount of work yet to be accomplished. In 2007, the Bruce Freeman Rail Trail Advisory Committee (BFRTAC) was formed to guide this effort. The committee took the charge of soliciting input from the community, administering workshops, and making sure the trail would meet the requirements to fit the nature of the Concord.

Throughout this process, local groups continued advocating for the construction of the BFRT, regularly attending the MPO meetings in Boston, reaching out to legislative representatives, and hosting numerous events along the trail.

One of the biggest advantages of the Bruce Freeman Rail Trail in Concord is the connection to the of the Massachusetts Bay Transportation Authority (MBTA) commuter rail station on the Fitchburg line. This station offers connected access outbound to Fitchburg/Wachusett (inbound to Boston) with a multitude of connections. According to the MBTA, the Fitchburg commuter rail had a daily ridership of 9,302 in 2018. A frequent criticism of public transportation is known as “the first mile/last mile” issue, meaning that the most difficult portion of a trip is between leaving home to reach public transportation and getting to work and then returning. The BFRT provides a safe and accessible path to extend the availability of travel by public transportation.

The bridge over the Assabet River is an important component of the trail. The old railroad bridge was taken down in the early 1980s, leaving a large gap in the trail system just south of West Concord Center. As one approaches the bridge from the West one crosses at the intersection of Main Street and Commonwealth Avenue in the heart of West Concord, which is quaint yet



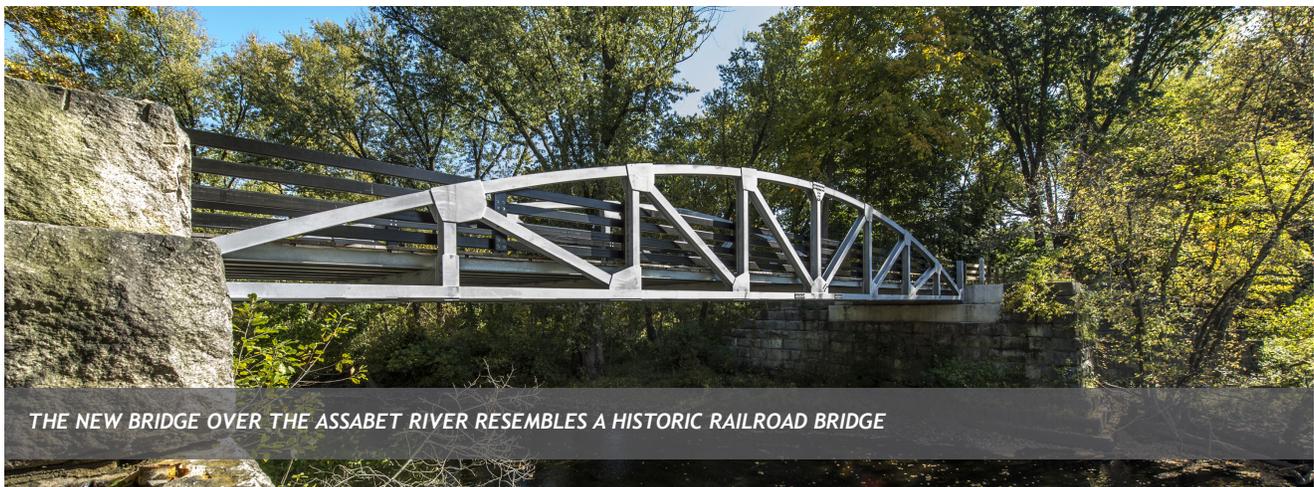
THE TRAIL CROSSES THE MBTA TRACKS AT-GRADE AND CONTINUES ADJACENT TO THE TRACKS AND DOWNTOWN BUSINESSES



vibrant village. Here one will find a bulletin board which is used for general information about the trail and its history as well as provides a medium for posting of community information and events. Across from the board is a self-service bike maintenance station that was installed as part of an Eagle Scout Service Project by a local Boy Scout. Just up the trail is the bridge, situated alongside a rest area where users can pull off the trail and sit on the benches or just take their time to partake in the natural beauty of the area.

The concept for the bridge was presented by GPI and vetted by the Bruce Freeman Rail Trail Advisory Committee and the municipality to enhance the appeal of this location. The bridge is a galvanized steel truss with welded gusset plates and a timber deck, which accentuates the wild and scenic river crossing (as designated by the US National Park Service). The truss

and timber deck have an old-style look, which provide a historical context of the railroad bridge that was once at this location. The span of the bridge is 87 feet and the bridge deck measures 14 feet in width, providing adequate space to stand on the bridge and take in the view and still allow for those commuting by bicycle to the West Concord MBTA station to safely pass. The bridge is founded on the existing granite block abutments dating back to the original bridge construction around the turn of the 20th century. A concrete cap was constructed to accept the bridge superstructure. The 16-foot high granite walls enable users both crossing the bridge and enjoying recreational boating below to experience the history firsthand. The bridge over the Assabet River provides a functional and multimodal transportation network, enhances the natural beauty of the area, and preserves the history of the railroad era.



SUSTAINABILITY

Criteria 2: Use of alternative materials, practices, or funding that demonstrates a commitment to sustainability.

The very nature of a Rails-to-Trails project elicits the feel of sustainability. The general sentiment has been that the rail corridor should be maintained for future use as a travel corridor. While the railroad companies would have probably rather seen trains take over the tracks

once again, it's hard to argue the benefit of the trail systems. This trail keeps the historic nature of the former railroad while providing access for all through this route.

Within the corridor remains many of the historic artifacts left over from the railroad days. Utilizing funding from the Community Preservation Funds, the Town of Concord was able to conduct an inventory and assessment of these artifacts from Public Archaeology Laboratory (PAL) as part of the 25% design.



ACCOMPLISHMENTS UNDER ADVERSE CONDITIONS

Criteria 3: Unique or unusual accomplishments under adverse conditions that dictated the defined action.

The advantageous connection to the commuter rail station also led to the most difficult decisions of the development process. Crossing an active rail line at-grade is a less than desirable solution, so numerous alternatives to this solution were examined. This included looking at the existing pedestrian crossings that serve the commuter rail and conducting a separate study of potential options for a bridge over the train tracks, a tunnel under the train tracks, using local roads, existing sidewalks, and off-road paths over town-owned land. The Town also designed three to five different options for an at-grade crossing along the railroad platform. After at least six years and approximately \$25,000, it was determined that there was no other viable solution acceptable to the community other than the at-grade crossing. The design team worked with the MBTA and their contractors to determine the safest way to proceed with this option. In the end, a new crossing was installed with proper crossing signals and barricades to stop trail users when a train is approaching.

The BFRT has many supporters in the community, but with shared use paths still being a new idea in the area, there were some reservations from pocket communities such as the residents around White Pond in south Concord. In the early stages of development, an alternative analysis was conducted to evaluate the options of getting off the rail corridor and around this area. In the end, it was determined that there were no feasible alternatives and concessions were made to appease the residents in the form of fences, dense vegetation, and slope stabilization to reduce further erosion.

Apart from what was added during the construction of the railroad remains the natural environmental resources of the area. The project length alone made an environmental assessment a project in and of itself. Concord worked with several local groups, including the Friends, and sought a grant from the Bikes Belong Coalition (aka Bikes for People) to raise the funds required for this initial assessment. As additional environmental concerns were raised regarding potential impacts to wildlife and threatened or endangered plants, the Natural Resources Division staff worked with residents to gather information that would help support design and construction details to benefit natural resources.

A significant portion of the design and construction funding came from sources dedicated to sustainability including the Massachusetts Statewide Congestion Mitigation and Air Quality (CMAQ) and Concord's Community Preservation Act (CPA) funds.

Further commitment to sustainability can be seen at several rest areas. Following the lead of Junction Park in West Concord Center installed several years earlier, three of the larger rest areas on the project include pervious pavers as the surface materials and rain gardens for stormwater infiltration.

COMMUNITY ECONOMIC CHALLENGES

Criteria 4: Economic challenges that the community faced, and the rationale of the option chosen.

Difficulties of a municipality funding all aspects of design and construction is always a challenge. As work was progressing during the initial 25% design, Concord was encouraged by the Metropolitan Area Planning Council staff to coordinate with the Town of Acton in seeking a State-wide Transportation Enhancement Grant for the 100% design because of the potential for collaboration and coordination on the design details for this part of the trail. The length proposed included four towns and was within the jurisdiction of two regional planning agencies and two MassDOT Districts (#3 and #4).

In addition to the initial funds provided by the Friends and Bikes Belong grant, the adoption of the Community Preservation Act by the Town established an additional source of funding for

additional wildlife studies, alternatives analysis (for the commuter railroad crossing and to address White Pond concerns), additional survey work, and landscape materials for the project. However, 100% design and construction of the trail was never a real option for the Town of Concord. Over \$410,000 was appropriated from Community Preservation funds for Phase 2C for these extra items that were not included in the State-wide Transportation Enhancement Grant.

At the end of 2016, MassDOT accepted a bid just under \$6.4M from D.W. White Construction, Inc. and issued the Notice to Proceed on February 8, 2017.

CREATIVE USE OF RESOURCES

Criteria 5: Creative use of municipal resources, equipment, labor, or funds that produced measurable benefits to the community.

BFRT Advisory Committee actively engaged with residents to address concerns during the



SIGNS DIRECT TRAIL USERS TO WALK BIKES PAST THE CAFE IN THE FORMER TRAIN STATION





PEDESTRIANS CAN EASILY ACCESS THE COMMUTER RAIL FROM THE TRAIL

design of the project. Committee members walked the corridor with abutters prior to and after the design plans were prepared for the landscaping to ensure that screening and other issues were being addressed. The Committee also held open house events inviting residents to review the plans and helped residents interpret and understand them. Monthly meetings provided a forum for raising and addressing concerns within the community.

The drainage design through the MBTA parking lot in West Concord Center proposed leaching basins to dissipate the stormwater, like the existing areas of the parking lot. Test pits were required to verify the soil conditions could accommodate these structures, but time and funds were running short. Instead of hiring a third-party to perform the excavation, Town equipment and staff was used to dig the test pits while the geotechnical engineers on the project team performed the analysis. This quick decision to use the Town equipment allowed the work to be completed before the winter weather potentially delayed the work several months, delaying the entire design schedule. Concord Public Works ordered additional pervious pavers when reconstructing Junction Park in

anticipation of the Junction Park extension resulting from the redesign of the Commonwealth Ave. and Main Street intersection. Additional pavers ordered by the contractor were then used in areas where high pedestrian traffic was anticipated (at the Nashoba Bridge rest area and the seating area near the Commonwealth Avenue/Main Street intersection thereby improving stormwater recharge in these locations.

CONSTRUCTION PROCESSES

Criteria 6: Construction processes that minimize the impact to the community and its residents during construction.

The construction of the concrete tunnel under Powder Mill Road required adhering to a tight schedule to minimize impacts to school bus routes over Powder Mill Road. After review and analysis of complete road closure versus partial road closure (i.e., maintaining one lane travel) it was determined a complete road closure would be the most cost-effective approach. The construction team had a three-month window during the summer to close the road, remove the existing





THE TUNNEL UNDER POWDER MILL ROAD SERVES AS A TERMINUS FOR THIS SECTION OF THE TRAIL UNTIL THE REMAINING 9.5 MILES ARE COMPLETED

corrugated steel culvert, install the new concrete culvert, and reopen the road for travel before the start of the school year. To ensure this schedule was maintained, Disincentive Deductions and Incentive Payments Requirements were added to the contract. This specification was intended to encourage the Contractor to use innovative methodologies, techniques, and extended work hours/days when approved by MassDOT to complete this milestone of the project. Understanding that the comfort of local residents was just as important as opening the roadway, time restrictions were still imposed, including no work on Sundays.

Approximately 5,000 cubic yards of earth were excavated and replaced during this short duration. The culvert consists of a precast culvert arch and headwalls supported on cast-in-place concrete walls. Using precast elements accelerated the schedule and allowed the construction team to meet the schedule. The new tunnel meets ADA guidelines and provides clearance for emergency vehicles on the trail. It will eventually provide access into Sudbury and onto Framingham as the trail progresses to its final vision.

ENVIRONMENTAL PRESERVATION

Criteria 7: Demonstrate awareness of opportunities for environmental preservation during the project and how they were incorporated in the project design and construction.

The bridge over Nashoba Brook is best described as a bridge preservation project. The seven riveted steel plate girders that support the bridge deck were cleaned and painted and the concrete deck was repaired and resurfaced. The wide surface of the bridge provides a rest area with historical information, a historic railroad switch, and preserved original railroad rails that are embedded into the pavers. By preserving and reusing the bridge rather than reconstructing it, environmental impacts were greatly reduced, and funds were saved. The bridge provides a focal part of the trail and is the gateway to the MBTA West Concord commuter rail station from points north.

Long sections of railroad tracks in the woods often leads to very flat terrain with poor drainage, frequently creating a valley through the surrounding area. Surface trench drains were utilized to minimize excavation required to preserve drainage patterns. Installing this type of



drainage system reduced the depth of excavation due to the surface installation instead of providing adequate cover between the top of the pipe and bottom of the pavement box.

Invasive species removal is an important process to go through with Rails-to-Trails projects. The old railroad corridors are no longer maintained, allowing both native and invasive species to take over followed by the invasive species taking over the natives. This project was no different, so several site walks were conducted to analyze the areas of heavy concentration, determine the best method for eradication and proposed replacement of native plants to fill in the natural feel of the area.

CONDITIONS IMPORTANT TO PUBLIC WORKS AGENCY

Criteria 8: Additional conditions deemed of importance to the public works agency, such as exceptional efforts to maintain quality control and, if value engineering is used, construction innovations as evidenced by time and/or money-saving techniques developed and/or successfully utilized.

From the beginning of this project, keeping the public informed and inviting public input was important to the Town. The BFRT Advisory Committee, created by the Select Board to provide recommendations to the Select Board, provided a valuable conduit for public outreach and information by posting meeting agendas, notices, memos, and plans on the Town's

website and having a dedicated webpage to invite public comment and share information. The Planning Division staff provided support to the BFRT Advisory Committee by coordinating publicity, providing information and update memoranda and making plans available.

Redesigning the intersection at Main Street and Commonwealth Avenue, including installation of new traffic signals was added to the project after completion of the 25% design when it was realized that the triangular landscaped traffic island could only provide 'safe haven' for one bicyclist when crossing the street. The initial design approach was to adhere to the absolute minimum design standards due to the proximity of the intersection to a dense commercial/village setting and the desire to limit removal of on-street parking while providing a safer pedestrian/bicyclist crossing for the BFRT. However, once the Contractor had installed the new curbing, concerns came from pedestrians who felt that heavy vehicles came within close proximity to the curb line when making turning movements from Main Street to Commonwealth Avenue. GPI was informed of this by the Town and provided a redesign of the curb line that better accommodated the turning movements while limiting the amount of reconstruction required. At a site meeting with GPI, MassDOT engineers and representatives, the Contractor's representatives, and Town staff, the Town suggested that if there were going to be any changes to the geometry, it would be their preference to provide additional clearance between heavy vehicles and the face of curb for both a WB-50 and a WB-67 vehicle. This request required additional work including: resetting of curb, reconstruction of sidewalk, and the relocation of additional traffic signal equipment. MassDOT did not indicate any significant concern with the additional request and agreed that it was the best alternative. GPI was also in agreement that this would be a preferred solution and the Contractor was willing to proceed without complaint. The final re-design and construction provides the desired safe crossing for pedestrians and bicyclists with clear, safe delineation of travel lanes for vehicles - to great satisfaction of the community.





PREVIOUS EXISTING CONDITIONS OF THE CULVERT



CULVERT DRAINAGE DURING CONSTRUCTION



ACCESSIBLE PATH FROM POWDER MILL ROAD TO TRAIL



ACCESSIBLE PATH FROM TRAIL TO POWDER MILL ROAD



GPI

Many Talents One firm

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