Bruce Freeman Rail Trail Environmental and Engineering Assessment Report Concord Section

Prepared For:

Town of Concord, MA

Prepared By:

FAY, SPOFFORD & THORNDIKE
Engineers – Planners – Scientists

August 2005

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Acknowledgements

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Friends of the Bruce Freeman Rail Trail

Massachusetts Executive Office of Transportation (EOT)
Massachusetts Bay Transportation Authority (MBTA)

Funding for this report was provided by funds privately raised by the Friends of the Bruce Freeman Rail Trail, a local non-profit 501(c)(3) organization advocating for development of the rail trail, and a grant from the Bikes Belong Coalition.

Executive Summary

The goal of the *Bruce Freeman Rail Trail Environmental and Engineering Assessment Report – Concord Section* was to determine the feasibility of developing a rail trail, or multi-use path, along the Concord portion of the former Lowell Secondary Track right-of-way of the Old Colony Rail Road. This section of corridor is currently owned by the Commonwealth of Massachusetts, under the care and control of the Executive Office of Transportation (EOT). In its entirety, the Bruce Freeman Rail Trail (BFRT) is a proposed 25-mile rail trail between Lowell and Framingham, 3.5 miles of which is located in Concord.

The report objectively outlines the corridor's potential as a shared-use rail trail and assesses the key design issues involved with the rail to trail conversion process. The report documents existing site conditions along the corridor including available right-of-way, adjacent land uses, presence of environmental, cultural and historic resources and contamination issues. Based on a review of this information, a conceptual rail trail design was developed which includes the proposed rail trail cross section and surface materials, at-grade intersection treatments, bridge structures, underpass options, parking facilities and access points, mitigation measures and trail enhancements. The design of the rail trail is highly dependent upon the width of the rail bed, adjacent land uses, proximity of environmental, cultural and historic resources and the desired types of users. The preliminary cost estimate for the construction of the 3.5-mile rail trail is approximately $4.1 million.

Two major issues identified and addressed as part of the report included the rail trail routing and crossing of the MBTA Commuter Rail Station in West Concord and the feasibility of diverting the rail trail away from White Pond in response to the concerns expressed by the White Pond neighborhood. To gain information on these issues, the Town and Consultant met with the White Pond Advisory Committee. Also, the Consultant met with the MBTA and the Town followed up with a letter to the agency requesting their review and input. Addressing these issues as part of the project planning process is advantageous for all involved parties.

Throughout the study process, input and information was gathered from town staff in the Town Manager's Office, Planning and Natural Resources Division within the Department of Planning and Land Management and the Engineering Division of the Concord Public Works Department. A number of State agencies were also consulted and provided their input, including the EOT, Commonwealth of Massachusetts Natural Heritage & Endangered Species Program and the Massachusetts Historical Commission.

In addition, a Public Informational Meeting was held on the evening of June 16, 2005. The meeting was advertised in the local newspaper and abutters received direct mailings. The comments, concerns and questions raised at the meeting as well as electronic and written correspondence received prior to and after the meeting are part of the Town's project record. This information will help guide future project planning and design activities.

Based on a review of the information gathered as part of the study process, and the Consultants experience on previous projects, it was deemed feasible to convert the former railroad corridor to a rail trail. With proper rail trail design sensitive to the project setting and continued public involvement, the rail trail could serve a variety of community functions - transportation alternative, close to home recreational facility, community meeting place, historical and cultural attraction, economic engine for local businesses and an accessible means of enjoying the natural landscape. The report outlines the next steps the Town needs to complete (or coordinate) in order to move forward with the project. Additional follow-up research and agency coordination will be required to advance the project to the design phase. Most importantly, the Town needs to thoroughly assess its preparedness for implementation in terms of project funding and local support, possibly through the appointment of a representative task force.

The funds for the report were raised by the Friends of the Bruce Freeman Rail Trail (FBFRT), a local non-profit 501(c)(3) organization advocating the rail trail, supplemented with a Bikes Belong Coalition grant. No Town funds were expended as part of this study effort.

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1 Introduction

1.1 Regional Overview

The Bruce N. Freeman Memorial Bicycle Path / Rail Trail is a proposed 25-mile shared-use path between Lowell and Framingham along the former Lowell Secondary Track right-of-way of the Old Colony Rail Road.

The trail was named in remembrance of the late State Representative Bruce Freeman, a Republican from Chelmsford, who served from 1969 until he passed away from cancer in 1986. Freeman was a key supporter for the creation of the trail during his term. His successor and fellow supporters continued to promote the project and were successful in obtaining the endorsement of the State Legislature in the Spring of 1987.

The shared-use path is at various stages of development along the project corridor (i.e. concept, study, design and construction). The project has been segmented into three phases based on corridor ownership and level of development.

- *Phase 1* - Extends from the Lowell/Chelmsford line near Cross Point Towers to Route 225 in Westford (7 miles). This phase has been designed and funded and construction may begin as early as next year. The section of right-of-way is jointly managed by the MA Executive Office of Transportation (EOT), MA Department of Conservation and Recreation (DCR) and the Towns.

- *Phase 2* - Extends from Route 225 in Westford through Carlisle, Acton, Concord and Sudbury to Route 20 (13 miles). The project is currently advancing on a town-by-town basis; permitting individual towns to proceed forward without being delayed by actions in adjacent communities. A detailed feasibility study has been completed for the Town of Acton. An additional $75,000 in funds for preliminary design activities and legal work was also approved at Acton's Town Meeting. The Central Transportation Planning Staff (CTPS) recently completed a study that included more detail on the right-of-way in Concord and Sudbury, including information on rail trail / roadway crossings. Funding for a feasibility study in Sudbury was recently approved at Town Meeting. This section of right-of-way is owned by the Commonwealth of Massachusetts, under the care and control of the EOT.

- *Phase 3* - Extends from Route 20 in Sudbury to just north of Route 9 in Framingham (5 miles). The CTPS is currently studying this section of right-of-way to identify the major issues and opportunities related to a potential rail to trail conversion. This study will build upon the study recently completed by a local group commissioned by the Town of Framingham, the Nobscot Trail Task Force. This section of right-of-way is owned by CSX Corporation. CSX has removed the tracks and ties from the railroad corridor and indicated that it will no longer be used for rail service and will be made available for sale.

The proposed facility is a rail trail, a shared-use path created along a former railroad right-of-way. These public facilities are ideal for many uses, including bicycling, walking, inline skating, cross-country skiing, equestrian and wheelchair use. Rail trails are extremely popular as alternative transportation and recreational facilities for residents and visitors.

1.2 Local Perspective

According to the Old Colony Rail Road Valuation Maps, 3.6 miles of the railroad corridor is located within Concord. This segment, known as the Bruce Freeman Rail Trail, extends through the westerly side of Concord from the Acton town line (just north of Route 2) to the Sudbury Town Line.

The study area for this Environmental and Engineering Assessment Report extends from Bridge No. 13.86 over Nashoba Brook (near Route 2) to the Sudbury Town Line for a distance of 3.5 miles. The Town specifically excluded the crossing of Route 2 from this Assessment since the

next phase of the Concord Rotary Redesign project will discuss how the proposed grade-separated interchange project would incorporate the extension of the proposed Bruce Freeman Rail Trail safely across Route 2.

As noted above, the Bruce Freeman Rail Trail project is being studied and developed on a town-by-town basis. As such, the Concord portion of the project can proceed forward in advance of adjacent communities along the railroad corridor.

1.3 Study Purpose

The purpose of this assessment is to determine the environmental and engineering feasibility of developing a rail trail along the Concord portion of the former railroad right-of-way.

The primary goals of this study are to:

- Address the major design issues related to trail development along the corridor
- Develop cost estimates for municipal and MPO programming purposes
- Provide recommendations as to the best way to proceed forward with the project

Ultimately this study will assist the Town and stakeholders in determining their willingness and ability to pursue this project from the study phase to the design, construction and maintenance of the trail.

1.4 Project Objectives

The following objectives articulate why the project is important and the benefits that will accrue from its implementation.

The proposed project will:

- Advance the goals and objectives outlined in Concord's Long Range Plan 2005 – 2020.
- Encourage alternative forms of transportation throughout the region as a means of reducing traffic congestion and promoting clean air.
- Provide a safe and pleasant transportation alternative for residents, workers and tourists of all ages and abilities, including trips to school and recreation sites.
- Improve non-motorized access and ridership to the MBTA Commuter Rail in West Concord center.
- Provide a multi-use rail trail connection to commercial areas along the trail so that users can benefit from the availability of services accessible without a car. These areas include Chelmsford Center, East Acton Village, West Concord and South Sudbury.
- Provide a rail trail connection between areas of cultural, economic, social and natural significance within Concord and along other portions of the regional rail trail.
- Provide recreational opportunities for residents of and visitors to the region.

1.5 Friends of the Bruce Freeman Rail Trail

Funding for this Environmental and Engineering Assessment study was raised by the Friends of the Bruce Freeman Rail Trail (FBFRT), supplemented with a Bikes Belong grant. The FBFRT is a non-profit group [501 (c)(3) corporation] advocating for the development of the proposed rail trail at the local, regional and state level. Membership is comprised of constituents from each of the communities along the project corridor. The group has been actively garnering local support for the project through monthly meetings and representation at local events and agency meetings. The FBFRT have expressed their willingness to assist the Town of Concord in their public outreach, fundraising and maintenance activities as the project moves from the planning stage to design and construction.

For more information the FBFRT may be reached at:
E-mail: BruceFreemanRT@aol.com
Website: www.brucefreemanrailtrail.org

2 Project Area Description

2.1 Location

The Bruce Freeman Rail Trail extends through the westerly side of Concord from the Acton town line (just north of Route 2) to the Sudbury Town Line for a distance of 3.6 miles. The rail trail follows the alignment of the former railroad right-of-way of the Old Colony Rail Road / ConRail. The railroad right-of-way is owned by the Commonwealth of Massachusetts, under the care and control of the Executive Office of Transportation (EOT).

The study area for this Environmental and Engineering Assessment extends from Bridge No. 13.86 over Nashoba Brook (near Route 2) southward to the Sudbury Town Line for a distance of 3.5 miles. The Town specifically excluded the crossing of Route 2 from this Assessment since the next phase of the Concord Rotary Redesign project will discuss how the proposed grade-separated interchange project would incorporate the eventual extension of the proposed Bruce Freeman Rail Trail safely across Route 2.

The proposed rail trail crosses both Nashoba Brook (two locations) and the Assabet River. There are four at-grade roadway crossings at Commonwealth Avenue, Main Street, Old Marlboro Road and Williams Road and one separated roadway crossing at Powder Mill Road (via an underpass). The Concord section of the Bruce Freeman Rail Trail also provides a critical transportation link to the MBTA Commuter Rail Station in West Concord.

A locus map of the project area on the Maynard USGS Quad Map is included at the end of this Section. More detailed mapping of the corridor is included in Appendix A of this Environmental and Engineering Assessment. All sheet references herein refer to the mapping in Appendix A.

2.2 Length & Width

The railroad right-of-way is 66 feet wide for most of its 3.5-mile length. The right-of-way is also wider than 66 feet in some locations and includes a few outcrops of land to the east and west. From the Assabet River crossing south to Old Marlboro Road, the right-of-way is 115.5 feet wide. The section of right-of-way from just south of Powder Mill Road to the Sudbury Town Line is 99 feet wide. The approximate centerline of the existing track is the established baseline for the right-of-way. The proposed rail trail will be located along the alignment of this existing track. The rail bed varies in width depending upon the adjacent cut and fill slopes and bordering wetlands.

2.3 Topography and Vegetation

The former rail bed is gentle in grade by design and the majority of the corridor is lined with varying depths of woodland vegetation. This vegetation provides some screening between adjacent properties and the corridor, particularly during the growing season. Only in the immediate commercial / industrial area of West Concord is there limited vegetation. The adjacent cut and fill slopes transition over the length of the corridor. Certain sections of corridor are relatively level across the width of the right-of-way whereas, in other areas, the cut and fill sections range from an elevation difference of 2 feet to well over 20 feet.

The rail trail would follow the existing track alignment and profile atop the rail bed. This approach minimizes the amount of required grading and disturbance to existing vegetation and adjacent environmental resource areas.

Figure 1: Corridor Between Bridge No. 13.86 and Commonwealth Avenue

Figure 2: Corridor Between Commonwealth Avenue and Bridge No. 14.81

Figure 3: Corridor Between Main Street (Route 62) and Old Marlboro Road

Figure 4: Corridor Between Old Marlboro Road and Williams Road

Figure 5: Corridor Between Williams Road and Powder Mill Road

Figure 6: Corridor Between Powder Mill Road and Sudbury Town Line

2.4 Adjacent Uses

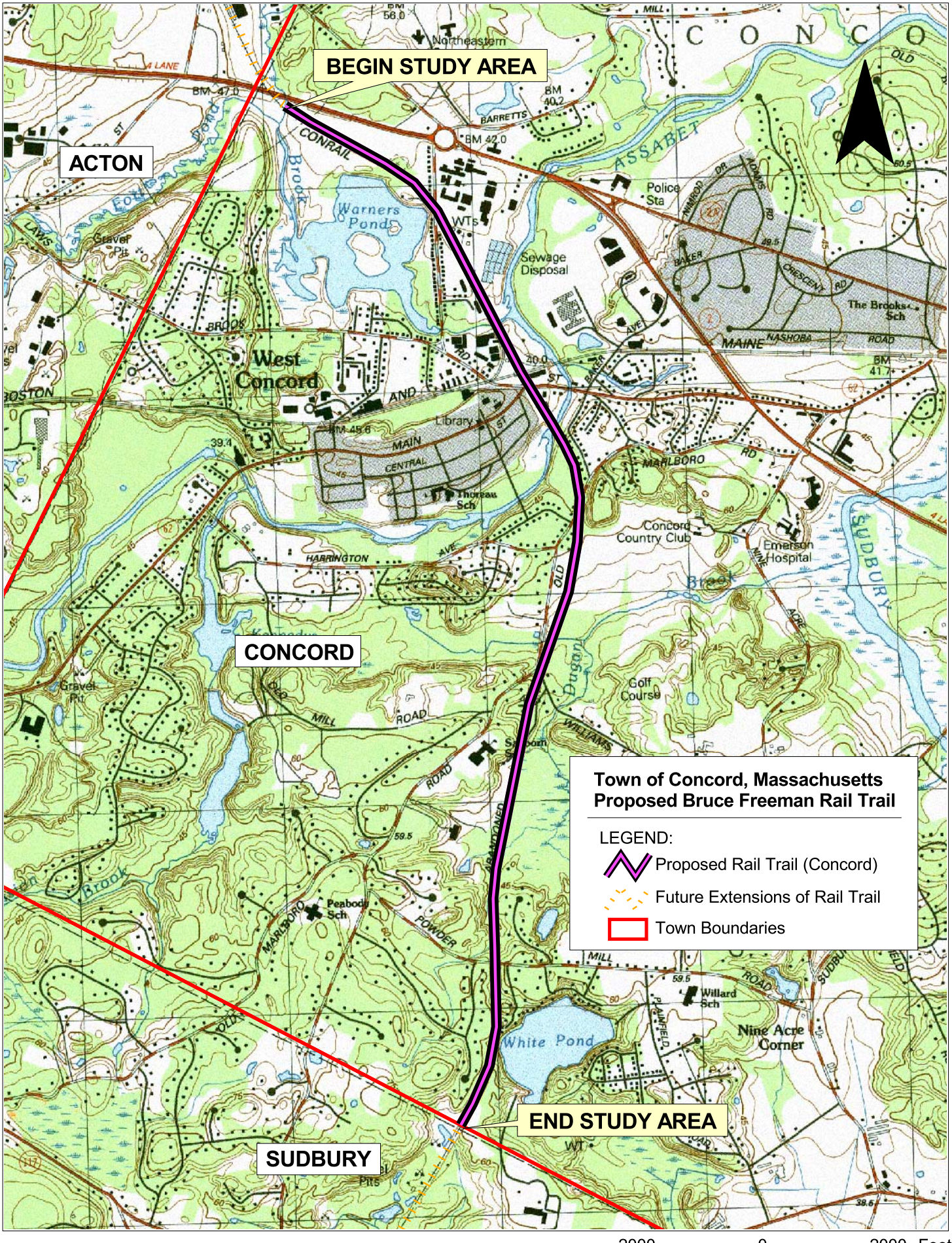
The majority of the railroad corridor travels through areas characterized by residential, open space and farmland uses. Many of these parcels are owned by the Town or Commonwealth of Massachusetts. There is a high concentration of commercial / industrial uses between Commonwealth Avenue and the crossing of the Assabet River, along a 0.70 mile section of corridor through the West Concord area. The sheets noted below reference the mapping included in Appendix A of this Environmental and Engineering Assessment.

Between Route 2 and Commonwealth Avenue, the railroad corridor travels between State owned farmlands used by the Northeastern Correctional Center as well as a wooded area adjacent to Warner's Pond and the Reformatory Cemetery (See Sheets 1 - 2 of 9).

Just past the Commonwealth Avenue crossing, the corridor travels alongside some residential homes, MCI-Concord and a mixture of commercial / light industrial uses (See Sheets 2 - 3 of 9).

The railroad corridor travels through the center of West Concord, a small commercial center with retail, food and convenience establishments, as well as some warehouse facilities. The corridor traverses the MBTA Commuter Rail Station platform (Fitchburg Commuter Rail line) and ancillary commuter parking lots in West Concord.

After crossing Main Street in West Concord, the corridor crosses the Assabet River and continues southward to the Sudbury Town Line. This southern section of corridor travels alongside open space/conservation land, wetland areas, White Pond and privately owned farmlands intermittent with residential homes / neighborhoods and school property. Some residential homes along Cottage Street, Old Marlboro Road, Williams Road, Jennie Dugan Road, Mitchell Road, White Avenue and Stone Root Lane are visible through the vegetation lining the corridor (See Sheets 4 - 9 of 9).



Data Source: Office of Geographic and Environmental Information (MassGIS)
Commonwealth of Massachusetts Executive Office of Environmental Affairs

3 Railroad Right-of-Way

3.1 History of Rail Service

The rail line was chartered in 1870 as the Framingham and Lowell (F&L) Railroad and opened in November 1871. The north-south line crossed the Boston & Maine Railroad (1844) to create a rail junction at the Concord Junction Depot. The neighboring villages, Westvale, Warnerville (Concord Junction) and Reformatory grew together as the railroads helped foster industry and agriculture in the area.

Ten years later, the F&L Railroad was sold at foreclosure due to a lack of traffic. The railroad was reorganized into the Lowell & Framingham Railroad and subsequently merged into the Old Colony Railroad. In 1893, the company became part of the New Haven Railroad system. At this time, the railroad lines were important to the State Prison (1887), both for workers and visitors arriving by rail and the shipping of goods that were manufactured by prisoners. The Concord Junction Depot area continued to grow in population; and churches, schools and retail stores were soon established. It was not until 1928 that the Town of Concord formally adopted the name West Concord for this railroading area. Passenger service on this line ceased in 1933.

The Old Colony Railroad line operated as part of this system until 1969, when it was acquired by the Penn Central Transportation Company and renamed the Lowell Secondary. At that time, the Lowell Secondary served a nightly freight train traveling from South Boston to Lowell via Readville, Walpole and Framingham. It continued to service this route until Penn Central declared bankruptcy in June of 1970. Consequently, there was a move to increase the efficiency of the railroad by consolidating traffic onto fewer lines. As a result, the Lowell Secondary began to only service a local freight train between Framingham and Lowell in 1973.

In 1976, the Consolidated Rail Corporation (Conrail) system was implemented to take over the operations of the key Penn Central lines. Because the traffic on most of the Lowell Secondary was below average, Conrail only acquired the 4.7 miles from Framingham Center to South Sudbury. The Boston and Maine Corporation purchased the 1.6 miles from the Lowell yard to U.S. Route 3 in Chelmsford that continued to serve several customers.

In the 1970's, most of the traffic on the Lowell Secondary constituted shipments of building materials to distributors in North Acton and Chelmsford. It was expected that traffic would continue to increase along the line and therefore the Commonwealth of Massachusetts Executive Office of Transportation (EOT) decided to subsidize service from South Sudbury to Chelmsford Center. The EOT leased the track from Penn Central and contracted with Conrail to provide service. Unfortunately, by 1979, it became clear that the line's traffic volumes did not develop due to a prolonged economic downturn in the building industry. The Lowell Secondary became the least cost-effective line in the EOT's rail subsidy program and freight service was suspended in April 1982. The EOT did however decide to purchase the segments of rail line in order to preserve the right-of-way for other public uses.

3.2 Title Conveyance

The deed transferring ownership of the railroad right-of-way from ConRail to the Commonwealth of Massachusetts, acting through the EOT was executed through two separate deeds. The first deed agreement was signed on May 3, 1982 and covers the section of railroad right-of-way from West Concord north to Bridge No. 9.83 over Nashoba Brook in North Acton. This deed is filed in Book 14609 / Page 302 at the Middlesex South District Registry of Deeds. The second deed agreement was signed on November 23, 1982 and covers the sections of railroad right-of-way from South Sudbury to West Concord, Bridge No. 9.83 over Nashoba Brook in North Acton north to Route 3 on the Chelmsford/Lowell border. This deed is filed in Book 2579 / Page 256 at the Middlesex North District Registry of Deeds.

Rail operation has officially ceased along the Lowell Secondary Track right-of-way, United States Railway Association Line Code 4130. The right-of-way is managed by the EOT on behalf of the Commonwealth of Massachusetts. The EOT has indicated that the Commonwealth has a strong interest in preserving the corridor for future transportation uses and is open to discussing its future with the Town.

3.3 Property Agreements

The EOT has reviewed their files to locate any legal agreements or correspondence between the Commonwealth and outside parties for private use of the railroad corridor within the Concord town limits. The result of this review is as follows:

Massachusetts Bay Transportation Authority (MBTA): In April 1991, the EOT granted a license agreement to the MBTA to permit the agency to use and maintain a parking area at the MBTA Commuter Rail Station in West Concord. The MBTA commuter parking lot is located on the north side of the West Concord rail junction, where the Lowell Secondary Track right-of-way crosses the active MBTA Commuter Line. The parking lot is situated entirely within the Lowell Secondary Track right-of-way, from approximately Valuation Map Station 607+18 to Station 613+42. This parcel contains about 24,800 square feet of land. A picture of the parking lot is shown to the right.

Figure 7: MBTA Commuter Parking Lot Looking North Along Rail Corridor

VOA Concord Assisted Living, Inc.: In March 2001, the EOT granted an access easement to VOA for perpetual rights and easements on three parcels of land within the Lowell Secondary Track right-of-way. This access easement permits access and utility rights across the commuter parking lot to the Concord Park facility on the west side of the right-of-way (See Sheet 3 of 9). In April 2001, the EOT granted a license agreement to VOA to install and maintain landscaping amenities within the limits of the railroad right-of-way. A picture of the VOA facility is shown to the right.

Figure 8: Concord Park Facility on East Side of Rail Corridor

Town of Concord: In July 1984, the EOT granted a lease agreement to the Town of Concord to construct and maintain a public park and pedestrian walkway within the Lowell Secondary Track right-of-way. The park is located on the south side of the rail junction, between the MBTA right-of-way and the intersection of Commonwealth Avenue with Main Street in West Concord center. The park, locally known as the Concord Junction Depot, contains approximately 7,954 square feet of land. A picture of Concord Junction Depot is shown to the right.

Figure 9: Concord Junction Depot Park and Pedestrian Walkway

Corrections Special Unit: As discussed in the next Section, Massachusetts Correctional Institution (MCI) -Concord, a facility of the Massachusetts Department of Corrections, is using a linear portion of the railroad right-of-way for an access drive. A picture of this access road is also included in the next Section. The Corrections Special Unit sent a letter to the EOT in March, 1989 in follow-up meeting held between the two agencies. The letter restated the Unit's interest in utilizing a 20-foot wide swath of the Lowell Secondary right-of-way to gain access to a parcel at the rear of the institution for additional parking. The letter specifically acknowledged that the railroad corridor was under study for use as a future bicycle path. The EOT's records do not indicate any follow-up correspondence or executed legal agreements between the EOT and Corrections Special Unit with respect to this issue.

The design of the rail trail should seek to permit the shared use of the right-of-way in order to avoid extinguishing the existing agreements signed with the aforementioned parties. If an existing agreement poses a problem to rail trail design and construction, the EOT will meet with all parties to see if an equitable solution can be reached to satisfy all parties. This issue will need to be reviewed in more detail during the preliminary design stages of the project.

3.4 Physical Encroachments

Based on a site walk by the consultant team and a review of existing legal agreements, there was only one significant encroachment identified along the corridor with the potential to impact the project design. This encroachment is located at the MCI-Concord facility.

MCI-Concord: MCI-Concord is currently using a linear portion of the railroad right-of-way for an access drive. This dirt road provides access between Commonwealth Avenue and a storage area at the rear of the prison. Use of the railroad right-of-way by MCI-Concord has not been legally authorized by means of a formal access easement granted. Rather, this use has occurred without prior approval from the EOT. Resolving the physical encroachment will require that MCI-Concord either enter into an agreement with the EOT for their use of the property, or vacate the property (remove the encroachment). Should this use be authorized by the EOT, it is recommended that the design of the rail trail include some form of physical

Figure 10: MCI-Concord Access Drive Along Corridor

separation for the safety of users. For example, an earthen berm, fence or vegetation could be used between the trail and the access drive.

Figure 11: Private Crossing Along Corridor

Along the railroad corridor, there are also a series of "private crossings" shown on the railroad valuation maps. At the time the valuation maps were drafted, many of these crossings were likely cow paths, etc. While some of these crossings may no longer exist, others appear to still be used for private access across the right-of-way in the form of residential driveways and municipal access roads. The nature of the rights of these private crossings will need to be assessed on a case-by-case basis. The only way to validate the legality of the private crossings as they currently exist would be to review the original deeds into the railroad (i.e., what rights were reserved by the original Grantor), as well as any dispositions / rights granted by the railroad after its initial acquisition, and to evaluate these documents in their current context. This additional reconnaissance should be included as part of a preliminary deed review, to be conducted prior to the design phase of the project. The design and construction of the rail trail will need to accommodate many of these private crossings.

3.5 Rail to Trail Conversion

In order for the Town to pursue plans to convert the railroad right-of-way to a rail trail, the Town must submit a formal application to the EOT stating their desired use and plans for the railroad corridor. The EOT can supply the Town with access to the land but does not financially contribute to the project. Pending approval from the EOT, the Town would be granted a property agreement for the design, construction and maintenance of the rail trail. The EOT will consider such property interests as required to operate a rail trail along the corridor. It is anticipated that the terms of the agreement will be a use agreement, an access easement or a combination of both.

The EOT generally recommends that a full title review be conducted for the corridor. This review should be a coordinated effort of the Town and EOT and carried out by a consultant experienced in railroad right-of-way research. The title report will trace the title from when the railroad originally acquired the land, forward in time to the present. The nature of the rights of various interests in the right-of-way, including the legality of private crossings, will be clarified in the context of this title review.

4 Environmental Resources

The purpose of the preliminary Environmental Screening is to identify potential environmental issues early in the rail trail development process. The assessment used secondary source information obtained from government agencies and GIS data provided by the Town of Concord.

4.1 Ponds

There are two primary waterbodies along the alignment of the railroad corridor, Warner's Pond and White Pond. Both of these ponds have high conservation values and recreation potential.

Figure 12: Warner's Pond

Warner's Pond is located to the west of Commonwealth Avenue, adjacent to the railroad corridor and Northeastern Correctional Center Farmlands along Route 2 (See Sheet 2 of 9). Warner's Pond an impoundment of Nashoba Brook, is an important link in the Assabet River Watershed. From the outlet at the southeast end of the pond, Nashoba Brook continues in a southerly direction to merge with the Assabet River in West Concord center. In addition to its natural resource and ecological values, the pond is also used for passive recreational uses including canoeing, bird watching, ice-skating and fishing. The Town, through the Warner's Pond Stewardship Committee and Natural Resources Division has been implementing a pond management plan to foster the long-term sustainability of this important resource.

Figure 13: White Pond

White Pond is located along the eastern side of the railroad corridor near the Concord/Sudbury Town Line (See Sheets 8 - 9 of 9). This 43-acre natural great pond has a sand and gravel bottom at an average depth of 30 feet and limited aquatic vegetation. The shorelines are moderately developed, particularly along the northwestern and southeastern shores. The town-owned White Pond Reservation borders White Pond to the south. The pond is also used for passive recreational uses including boating/canoeing, bird watching and year round fishing. The Massachusetts Public Access Board owns a public boat ramp on the pond's northeastern tip. White Pond is heavily stocked in the spring and fall with rainbow trout, brook trout and brown trout by the Massachusetts Department of Fisheries & Wildlife. One of the goals set forth in the Town's Long Range Plan is to protect White Pond from overuse.

4.2 Rivers and Streams

The rail trail crosses Nashoba Brook in two locations, approximately 350 feet south of Route 2 (Bridge No. 13.86) and 800 feet north of the MBTA tracks (Bridge No. 14.81). Nashoba Brook flows in a southerly direction towards the Assabet River.

Figure 14: Assabet River Looking Upstream

Concord is one of fourteen towns located in the Sudbury-Assabet-Concord (SuAsCo) River Basin. Portions of the Sudbury, Assabet and Concord Rivers are components of the National Wild and Scenic Rivers System, under the full protection of the Wild and Scenic Rivers Act. Approximately 4.4 miles of the Assabet River in Concord has been designated as Wild and Scenic, from 1000 feet below the Damon Mill Dam in West Concord to confluence with the Sudbury and Concord Rivers. This section includes the Bruce Freeman Rail Trail crossing of the Assabet River.

The Wild and Scenic Rivers Act [U.S.C. 1271-1287] has identified the following "outstandingly remarkable values" of the Sudbury Assabet and Concord Rivers:

- Ecology
- Archeology and History
- Scenic
- Recreation
- Literary resources

The National Park Service (NPS) has control over this section of the Assabet River and manages it jointly with the SuAsCo River Stewardship Council, which is comprised of local citizens, federal, state, and local governments, and advocacy groups. According to the Rivers Program Manager / NPS Northeast Region, if federal funds are used (i.e. SAFETEA) and National Environmental Policy Act (NEPA) review is required, NPS will comment on the design of the rail trail bridge. Also, NPS would comment if an Army Corps of Engineers (ACOE) Permit was required for the project. However, construction of rail trails almost never cause significant environmental impacts, and as such are automatically classified as Categorical Exclusions (CEs) under NEPA and, except in unusual circumstances, do not require federal approval. Also, it is not anticipated that an ACOE Permit will be required as no work is being completed within the waterway. The Rivers Program Manager / NPS Northeast Region indicated they would most likely be supportive of the rail trail project in any event.

4.3 Wetlands

The southern portion of railroad corridor travels through a significant wetland resource area classified as a combination of shrub and wooded swamp (deciduous and coniferous) by the Massachusetts Department of Environmental Protection (DEP). This area is concentrated behind the Sanborn Middle School (See Sheets 6 - 7 of 9).

Figure 15: Wooded Swamp Behind Sanborn Middle School

There are wetland systems along the shoreline of Warner's Pond and concentrated along the stream and river crossings along the corridor. There is an isolated shallow marsh meadow wetland just north of White Pond (See Sheet 8 of 9).

All wetland resource areas along the right-of-way will need to be delineated in the field and included as part of the survey base mapping as part of the design phase. The corridor is located within the buffer zone of many of these wetland areas and is therefore subject to applicable local, state and federal wetland regulations, as discussed further in the Environmental Permitting Section of this report.

4.4 Vernal Pools

Vernal pools are small, shallow ponds characterized by lack of fish and seasonal periods of dryness. Vernal pools are unique wildlife habitats best known for the amphibians and invertebrate animals that use them to breed exclusively, and other organisms that spend their entire life cycles confined to vernal pool habitat.

There are three vernal pools located in the vicinity of the railroad corridor. The pools are as follows:

Figure 16: Vernal Pool Adjacent to Corridor

Certified Vernal Pool 944: This pool is located on private property on the eastern side and adjacent to the railroad corridor, approximately 230 yards south of Powder Mill Road. Documented species include the Mole Salamander, Wood Frog and Facultative Amphibian. The pool was certified on June 4, 1996.

Certified Vernal Pool 955: This pool is located on the western side and adjacent to the railroad corridor, approximately 210 yards north of Powder Mill Road. Documented species include the Mole Salamander, Wood Frog and Fairy Shrimp. The pool was certified on June 11, 1996.

Certified Vernal Pool 956: This pool is located on the western side and adjacent to the railroad corridor, approximately 350 yards north of Powder Mill Road. Documented species include Fairy Shrimp and Facultative Invertebrates. The pool was certified on June 11, 1996.

All three vernal pools are certified by the Natural Heritage & Endangered Species Program (NHESP) according to the Guidelines for Certification of Vernal Pool Habitat (5/88, MA Division of Fisheries & Wildlife). Certified vernal pools are also protected under the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00), Massachusetts Water Quality Certification (401 Program), Title 5 and the Forest Cutting Practices Act regulations.

Certification of a pool establishes that it biologically functions as a vernal pool but does not determine if a pool is within a resource area under the jurisdiction of the Massachusetts Wetlands Protection Act Regulations (310 CMR 10.00). Certified vernal pools must occur within a resource area that comes under the jurisdiction of the Act or regulations before they receive protection. Performance standards exist for vernal pools that occur within *Land Subject to Flooding*.

Similarly, certified vernal pools are protected under Section 40l of the federal Clean Water Act as administered by the Massachusetts Surface Water Quality Standards (314 CMR 4.00). Under these regulations, any certified vernal pool is classified as an Outstanding Resource Water. The

regulations, administered by the DEP, strictly prohibit discharges of solid or liquid fill within certified vernal pools. The certified vernal pool as well as the proposed activity must be within the jurisdiction of the State's Clean Water Act in order to receive protection.

All three vernal pools and their 100 feet boundary (referred to as the "vernal pool habitat") fall outside of a wetlands resource area as outlined under the Massachusetts Wetlands Protection Act (310 CMR 10.00). Also, no direct discharges from the proposed rail trail construction will be channeled (tributary) to the vernal pools.

Appropriate mitigation measures will need to be incorporated into the design and construction phases of the rail trail project to protect the vernal pool habitats.

4.5 Floodplain and Groundwater Conservancy

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for the Town of Concord revealed that the railroad right-of-way is within Zone AE and Zone X in areas proximate to the three waterway crossings. Zone AE is an area inundated by 100-year flooding for which Base Flood Elevations (BFEs) have been determined. Zone X is an area inundated by 500-year flooding, an area inundated by 100-year flooding with average depths of less than 1 foot or with drainage areas less than 1 square mile, or an area protected by levees from 100-year flooding. Compensatory storage will be required for all flood storage volumes that will be lost, if any, as a result of the rail trail construction. This volume will be determined during the design stage.

The southern portion of railroad corridor, from just south of Old Marlboro Road crossing south to the Sudbury Town Line, travels through the Town's Groundwater Conservancy District. The rail trail project will be subject to any applicable regulations of the Town's Zoning Bylaw.

4.6 Wildlife Habitat

Information was requested from both the Commonwealth of Massachusetts Natural Heritage & Endangered Species Program (NHESP) and the U.S. Fish & Wildlife Service, New England Field Office, regarding the presence/absence of State-listed and Federally-listed endangered/threatened species and species of special concern within and proximate to the project area. The response letter from each agency is included at the end of this Section.

On June 6, 2005, the U.S. Fish & Wildlife Service, New England Field Office, issued a letter indicating that there are no federally-listed or proposed, threatened or endangered species or critical habitat under the agency's jurisdiction along the railroad corridor. Therefore, the preparation of a Biological Assessment or further consultation with the U.S. Fish & Wildlife Service under Section 7 of the Endangered Species Act is not required at this time.

On May 24, 2005, NHESP issued a letter providing requested information on state-protected rare species that occur along the alignment of the rail trail. The project area (railroad corridor) occurs within or immediately adjacent to the following Priority Habitat for Rare Species (PH) and Estimated Habitats for Rare Wildlife (WH):

PH 466 / WH 143: This polygon follows the general alignment of the Assabet River. The rail trail travels through this polygon for a length of approximately 650 feet, in the vicinity of the rail trail crossing of the Assabet River. The rail trail would be partially located within the mapped polygon.

PH 506 / WH 149: This edge of this polygon is bounded to the northwest by the approximate alignment of Old Marlboro Road and to the east by Route 2. The polygon encompasses Concord Country Club, Emerson Hospital and Sudbury River. The rail trail travels through the corner of this polygon from a point near the rail trail crossing of Old Marlboro Road southward for a distance of approximately 850 feet. The rail trail would be partially located within the mapped polygon.

The complete list of rare species occurring within these polygons is listed in the response letter from the agency included at the end of this Section.

NHESP recommends that that the Town contact the agency as early as possible in the project planning and design process to discuss rare species permitting. Early coordination with NHESP will ensure that appropriate mitigation measures are incorporated into the preliminary project design in order to protect rare species and rare species habitat. NHESP has requested that preliminary project plans and a project description be submitted for NHESP's Environmental Review to determine whether a probable "take" of rare species would occur as defined within the *MA Endangered Species Act* and *Regulations* (321 CMR 10.00).

As the project design advances, Notice of Intent Applications will need be filed in accordance with the *Massachusetts Wetlands Protection Act* (M.G.L., c. 131, s. 40), its implementing *Regulations* (310 CMR 10.00), and all local wetlands protection bylaws for proposed work activity occurring within the Estimated Habitats referenced above.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
New England Field Office
70 Commercial Street, Suite 300
Concord, New Hampshire 03301-5087

June 6, 2005

Reference:	Project	Location
	Rail trail	Concord, MA

Jennifer Shemowat
Fay, Spofford & Thorndike, LLC
5 Burlington Woods
Burlington, MA 01803

Dear Ms. Shemowat:

This responds to your recent correspondence requesting information on the presence of federally-listed and/or proposed endangered or threatened species in relation to the proposed activity(ies) referenced above.

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes our review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your coordination. Please contact us at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Michael J. Amaral

Michael J. Amaral
Endangered Species Specialist
New England Field Office

JUN 08 '05

Commonwealth of Massachusetts

Division of Fisheries & Wildlife

MassWildlife

Wayne F. MacCallum, *Director*

May 24, 2005

Jennifer Shemowat
Fay, Spofford & Thorndike, LLC
5 Burlington Woods
Burlington, MA 01803

Re: Bruce Freeman Rail Trail Project
Concord, MA
NHESP File: 05-17908

Dear Ms. Shemowat,

Thank you for contacting the Natural Heritage and Endangered Species Program ("NHESP") of the MA Division of Fisheries & Wildlife for information regarding state-protected rare species in the vicinity of the above referenced site. We have reviewed the site and would like to offer the following comments.

The southern portion of the proposed project site intersects Certified Vernal Pool #s 944, 955, and 956.

This project site is also located partially within Priority Habitat 506 and Estimated Habitat 149 as indicated in the 11th Edition of the Massachusetts Natural Heritage Atlas. Our database indicates that the following state-listed rare species have been found in the vicinity of the site:

Scientific name	Common Name	Taxonomic Group	State Status
Desmocerus palliatus	Elderberry Long-Horned Beetle	Beetle	Special Concern
Ambystoma laterale	Blue-Spotted Salamander	Amphibian	Special Concern

This project site is also located partially within Priority Habitat 466 and Estimated Habitat 143 as indicated in the 11th Edition of the Massachusetts Natural Heritage Atlas. Our database indicates that the following state-listed rare species have been found in the vicinity of the site:

Scientific name	Common Name	Taxonomic Group	State Status
Ligumia nasuta	Eastern Pondmussel	Mussel	Special Concern
Alasmidonta undulata	Triangle Floater	Mussel	Special Concern

These species are protected under the Massachusetts Endangered Species Act (MESA) (M.G.L. c. 131A) and its implementing regulations (321 CMR 10.00). State-listed wildlife are also protected under the state's Wetlands Protection Act (WPA) (M.G.L. c. 131, s. 40) and its implementing regulations (310 CMR 10.37 and 10.59). Fact sheets for these species can be found on our website http://www.nhesp.org.

Please note that before the initiation of any work at the above-listed project site, project plans **must** be reviewed by the NHESP for compliance with the state-listed rare species protection provisions of MESA (321 CMR 10.00) and the WPA (310 CMR 10.00). If the project site is within Estimated Habitat for Rare

Division of Fisheries and Wildlife
Field Headquarters, One Rabbit Hill Road, Westborough, MA 01581 (508) 792-7270 Fax (508) 792-7275
An Agency of the Department of Fisheries, Wildlife & Environmental Law Enforcement

Wildlife and a Notice of Intent (NOI) is required, then a copy of the NOI must be submitted to the NHESP in a timely manner, so that it is received at the same time as the local conservation commission. Whether or not the proposed project is within Estimated Habitat, preliminary project plans and a project description must be sent to NHESP Environmental Review to determine whether a probable "take" under the MA Endangered Species Act would occur (321 CMR 10.02).

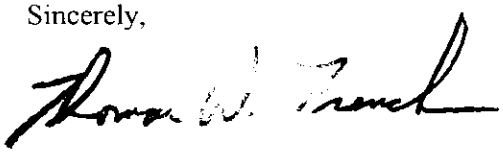
We recommend that the project proponent confer with the NHESP about rare species permitting issues as early in the project planning and design process as possible, as early consultation may expedite endangered species regulatory review. On a case by case basis, please note that more extensive surveys may be required in order to locate rare species on the project site, and to determine their patterns of distribution and habitat use.

MA Endangered Species Act (M.G.L. c. 131A)
If NHESP determines that the proposed project would "take" a rare species, then it may be possible to redesign the project to avoid a "take." If such revisions are not possible, the applicant should note that projects resulting in the "take" of state-protected wildlife may only be permitted if they meet the performance standards for a "Conservation and Management Permit" under MESA (321 CMR 10.04(3)(b)). Please note that projects resulting in a "take" will require submission of an Environmental Notification Form, pursuant to the MA Environmental Policy Act regulations (301 CMR 11.00).

Wetlands Protection Act
If the NHESP determines that the proposed project will adversely affect the actual Resource Area habitat of state-protected wildlife, than the proposed project may not be permitted (310 CMR 10.37, 10.58(4)(b) & 10.59). In such a case, the project proponent may request a consultation with the NHESP to discuss potential project design modifications that would avoid adverse effects to rare wildlife habitat.

This evaluation is based on the most recent information available in the Natural Heritage database, which is constantly being expanded and updated through ongoing research and inventory. Should your site plans change, or new rare species information become available, this evaluation may be reconsidered. If you have any questions regarding this review please call Joanne Theriault, Environmental Review Assistant, at ext. 310.

Sincerely,



Thomas W. French, Ph.D.
Assistant Director

cc: Concord Planning Board
Concord Natural Resources Commission

5 Drainage Patterns

5.1 Culverts

Along the right-of-way alignment, several existing culverts convey natural waterways and drainage to either side of the rail trail embankment. Given that the rail trail should not significantly alter the hydrologic characteristics of the watershed area tributary to each crossing, these culverts will remain.

The Old Colony Rail Road Company Valuation Maps were used as a guide for locating culverts in the field. As the maps date back to 1915, it can be expected that adjacent land uses have changed significantly over time. Consequently, it is not surprising that some of the culverts could not be located in the field and additional culverts have been constructed since the time the railroad was in operation.

The following list of culverts was developed based on the Valuation Maps and/or site reconnaissance efforts:

CULVERT LISTING			
#	**Val Map Station**	**Size / Material**	**Location Description**
1	664+73±	Stone Box	Filled in as noted on Val Maps Just south of Bridge No. 13.86
2	699+66	12" Vitrified Clay Pipe	North of Reformatory Cemetery
3	636+28.24	6" Tile Pipe	Connected to CB at Commonwealth Ave.
4	605+10±	6" Tile Pipe	Just north of Main Street / Route 62 intersection
5	603+30±		Just south of Main Street / Route 62 intersection
6	601+50±	12" Vitrified Clay Pipe	Between Main Street / Route 62 intersection and Bridge No. 15.16
7	566+37	12" Vitrified Tile Pipe	South of Old Marlboro Road crossing North of Williams Road
8	560+98	Tile Pipe	South of Old Marlboro Road crossing North of Williams Road
9	545+84.1	1'x1' Open Box	South of Williams Road
10	545+71.3	1'x1' Wood Box	South of Williams Road
11	543+77	1'x1' Wood Box 12" Tile Pipe	South of Williams Road
12	539+83.8	18" Cast Iron Pipe	South of Williams Road
13	526+05.6	3.5'x4' Stone Box	South of Williams Road
14	508+87±	12" Tile Pipe	East side of Powder Mill Road Underpass

The structural integrity and functionality of these culverts will need to be evaluated during the early stages of the design process.

5.2 Stormwater Management

The rail trail will likely contribute stormwater runoff to adjacent wetland areas and waterways. Special consideration will need to be given toward the protection of these resources.

Stormwater drainage facilities, for the most part, will consist of open, vegetated swales constructed along the edge of the trail alignment. The rail trail will also have a cross slope pitched toward the swales to direct and control stormwater runoff.

The goal of stormwater design will be to maintain existing swales and drainage patterns, allow rainwater to percolate into the soil, avoid point source discharge and meet current Massachusetts Stormwater Management Guidelines and Phase II of the National Pollutant Discharge Elimination System Stormwater (NPDES) program. Plunge pools or sedimentation basins will need to be provided in locations where a concentrated flow is anticipated. Erosion control techniques will be incorporated as part of the project design. The project should be compliant with the Town's stormwater management plan.

5.3 Erosion Control Measures

Much of the erosion along the trail can be attributed to uncontrolled stormwater runoff and poor drainage characteristics (i.e. lack of drainage swales). The extent of this erosion varies from localized pockets of shoulder erosion to failing slopes adjacent to the trail.

A number of measures could be used to reduce and repair the eroded areas, such as:

- Vegetative slope stabilization
- Erosion control fabrics and mats
- Soil stabilizers
- Regrading and/or placement of riprap or modified rockfill

Vegetative slope stabilization includes treatments such as replacing lost topsoil with new loam in gullies and replanting slopes with plant species that grow with fibrous, adventitious roots that spread and hold the steep slopes.

Figure 17: Visible Erosion Adjacent to Railbed

Other erosion control measures, often used with intensive vegetative slope stabilization on longer and steeper slopes include bioengineered solutions such as erosion control fabrics and mats, cellular confinement systems (such as geocell) or placed stone.

The appropriate erosion control measure would be selected depending on the extent of the erosion and site-specific conditions.

At the location shown to the left, it appears that a small channel runs from a water resource area near the Deer Grass Lane / Sudbury Town Line northward through a contiguous tract of Common Land to outlet near the railroad corridor. Adjustments to the swale along the edge of the rail bed would need to be studied to ensure that the existing drainage patterns are not disturbed. Given the visible erosion in this area, we would recommended stabilization of the slope, likely with modified rockfill, to prevent further wash-outs and improve trailside conditions.

6 Environmental Permitting

As documented in the previous sections, the railroad right-of-way travels alongside several environmentally sensitive areas. However, based on the Consultant's site walk and experience on previous projects, permitting and environmental impacts can be either avoided or mitigated.

The following is a list of the anticipated environmental permits.

6.1 Wetlands Protection Act

Notice of Intent (NOI)

The Wetlands Protection Act (WPA) governs activities affecting wetlands through the local Natural Resources Commission with Massachusetts Department of Environmental Protection (DEP) oversight. The DEP's most recent revision to the wetlands regulations was March 11, 2005. In general, for rail trails, any activity which will remove, fill, dredge or alter an area subject to regulation (i.e. wetlands, rivers and floodplains) requires the filing of a Notice of Intent (NOI). Also, any activity within 100 feet of an area subject to regulation (called the Buffer Zone) that, in the judgment of the issuing authority, will alter an area subject to protection, requires the filing of a NOI.

Early coordination with the Commission is recommended due to the sensitive nature of the project. An NOI will be filed with the Natural Resources Commission once detailed design plans have been prepared.

Rivers Protection Act

The Rivers Protection Act was signed into law August 7, 1996 and added a new resource area and accompanying performance standards to the WPA. Regulatory revisions and amendments to the WPA were enacted in 1997, 2000 and 2002 for language stated within Riverfront Area section of the WPA, 310 CMR 10.58. According to 310 CMR 10.04, an intermittent stream is a body of running water that does not flow throughout the year. Under the WPA, such streams are not afforded the 200 ft Riverfront Area status.

The proposed rail trail and bicycle / pedestrian bridges over Nashoba Brook and the Assabet River will be located within a previously developed Riverfront Area. This corridor was previously used for railroad operations. 310 CMR 10.58 (5) enumerates specific Performance Standards for Redevelopment within Previously Developed Riverfront Areas, including language on Restoration and Mitigation. The construction will follow the alignment of the existing rail bed and make use of the existing granite stone bridge abutments. There are no other practicable alternatives. The design of the rail trail and bridges will need to avoid or mitigate any adverse impacts to the riverfront resource area.

An analysis of impacts to Riverfront Area will need to be included with the NOI (WPA Form 3).

Bordering Land Subject to Flooding

Bordering Land Subject to Flooding (BLSF) is an area that floods from a rise in a bordering waterway such as a river, stream, or lake. A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps for the Town of Concord revealed that the railroad right-of-way is within Zone AE, areas of 100-year flood and Zone X, areas of 500-year flood. Compensatory storage is required for all flood storage volumes that will be lost as a result of the construction of the proposed rail trail. The total volume of flood storage lost, if any, will be determined when profiles and critical sections are developed during the 75% design stage.

Stormwater Management Policy

Also under the oversight of the Natural Resources Commission is the Stormwater Management Policy. These standards regulate water quality (pollutants) and water quantity (flood control) through the use of Best Management Practices (BMPs). BMPs could include silt fences, haybales, etc. The Stormwater Management Form should be included with the NOI filing.

6.2 NPDES General Permit for Discharges from Construction Activities

Phase II of the National Pollutant Discharge Elimination System (NPDES) Stormwater program was published in the Federal Register on October 8, 1999. As outlined in Phase II, any construction activity that will disturb one or more acres and has the potential to have a discharge of stormwater to a water of the United States must either have a permit or have qualified for a waiver. Construction activity here refers to the actual earth disturbing construction activities and those activities supporting the construction project such as construction materials or equipment storage, maintenance, measures used to control the quality for stormwater associated with construction activity, or other industrial stormwater directly associated with construction activity.

As proposed, the Concord portion of the Bruce Freeman Rail Trail consists of 3.5 miles of rail trail that is 10 feet wide with a shoulder on either side and additional vegetative clearing, as needed. The 10-foot wide portion of the project alone will result in approximately 4.2 acres of disturbed area, therefore exceeding the 1-acre threshold and requiring a permit. In order to apply for permit coverage the operator (Town or contractor) will need to submit an NOI, Stormwater Pollution Prevention Plan (SWPPP), and documentation of eligibility to the Environmental Protection Agency (EPA). The SWPPP details construction activities, erosion control measures, and inspection schedules to be implemented during construction to ensure that the construction activities do not have an adverse impact on wetlands and waterways.

The Town of Concord has a partially regulated small municipal separate storm sewer system (MS4). Phase II requires operators of regulated small MS4s to implement and enforce a program that will address stormwater runoff from new development and redevelopment projects that disturb greater than one acre and discharge to the municipal system. As part of this minimum control measure, the Town's Engineering Department performs a preconstruction review of proposed stormwater management BMPs for projects undergoing review in the Department of Planning and Land Management. Accordingly, this project will be reviewed to determine if the proposed stormwater BMPs are adequate.

6.3 Massachusetts Environmental Policy Act (MEPA)

The MEPA office is part of the Executive Office of Environmental Affairs (EOEA). The purpose of MEPA is to evaluate environmental impacts of a proposed project. An Environmental Notification Form (ENF) or Environmental Impact Report (EIR) is required to be submitted to MEPA if certain environmental impacts or review thresholds are exceeded. Although there are many review thresholds for all types of projects from airports to electric generating facilities, the two most common thresholds to trigger an ENF for rail trails are as follows:

- Creation of 5 or more acres of *impervious* area. This translates to 4.1 miles for a 10-foot wide multi-use path and 3.4 miles for a 12-foot multi-use path.

- Alteration of 5,000 or more square feet of bordering or isolated wetlands.

An ENF should be submitted after the preliminary design plans have been developed. Based on the above criteria, an ENF may not be required as the total length of the Concord portion of the Bruce Freeman Rail Trail (3.5 miles) will result in less than 5 acres of impervious area and is not expected to impact adjacent wetlands.

6.4 National Environmental Policy Act (NEPA)

Categorical Exclusion (CE) Checklist

As most rail trail projects involve Federal funds (TEA-21), compliance with NEPA will be required. Construction of bikeways almost never cause significant environmental impacts, and as such are automatically classified as CEs and, except in unusual circumstances, do not require FHWA approval. Detailed responses must accompany the CE Checklist.

7 Contamination Issues

7.1 Overview

Contamination along a railroad corridor is typically the result of either:

- Residual contamination from railroad operations
- Contamination associated with adjacent uses along the railroad corridor

The most common contamination found along a railroad corridor is residual contamination from railroad operations. According to the Rails-to-Trail Conservancy's study on "Understanding Environmental Contaminants" (October 2004), the most commonly reported contaminants along rail corridors include arsenic, which was used as an herbicide to control weeds, metals and constituents of oil or fuel (petroleum products), which likely dripped from the rail cars as they passed over the corridor. Coal ash is also considered residual contamination. In addition, the existing railroad ties along the corridor were likely treated with creosote and therefore need to be removed and transported in accordance with local, state, and federal hazardous waste disposal requirements.

There is also the possibility that use histories of adjacent properties may have resulted in contamination along the corridor. Such histories could include improper disposal actions along the railroad corridor or a release of oil or hazardous material on an adjacent site.

A preliminary hazardous waste and contaminated materials screening was conducted for the railroad corridor. The preliminary screening is a general review to identify properties in close proximity to the project area that could either contain or be a source of hazardous wastes or contaminated materials. The screening was limited to conducting a brief visual inspection along the railroad corridor and reviewing the following searchable databases:

- Massachusetts Department of Environmental Protection (DEP) Bureau of Waste Site Cleanup (BWSC) database for sites where a release of oil or hazardous material (OHM) has been reported to DEP. At the time the search was run, the DEP maintained site/reportable release database was current as of April 25, 2005. This search was supplemented with the DEP Tier Classified Oil or Hazardous Material Sites (MGL c. 21E) datalayer obtainable from MassGIS.

- Comprehensive Environmental Compensation Liability Act (CERCLA) List (Federal Superfund Site List) for sites. The EPA's Superfund Query Form was used to retrieve data from the Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database.

- DEP Solid Waste Facility (landfills, transfer stations, and combustion facilities) datalayer obtainable from MassGIS.

- Underground Storage Tank (UST) registry for tank and facility information on sites that use or store hazardous materials. This registry is administered through the Massachusetts Department of Fire Services, Office of the State Fire Marshall, to track the installation, operation, removal and disposal status of every regulated UST in the Commonwealth. This search was supplemented with the UST Locations datalayer obtainable from MassGIS.

Sites within a 0.25-mile radius of the rail trail were reviewed and documented as part of this screening. The approximate location of each site was determined using the Town of Concord's Parcel datalayer in conjunction with the Town's assessor database. Some sites could not be located based on the limited address information included in the databases.

Each site was evaluated for potential project impact based on the information provided in the databases including use histories, the type of site and proximity to the project. This screening aims to evaluate more general issues along the rail trail and does not involve details on any one property. Sites of known contamination are a greater concern than sites with potential contamination.

7.2 Adjacent Land Use

The majority of the railroad corridor travels through areas characterized by residential, open space and farmland uses. However, there is a high concentration of commercial / industrial uses between Commonwealth Avenue and the crossing of the Assabet River, along a 0.70 mile section of corridor through the West Concord area. All but two of the DEP BWSC sites within a 0.25-mile radius of the corridor were located in this general area. Also, the majority of USTs were located in the West Concord area.

The following paragraphs describe general land use along the corridor from north to south. The sheets noted below reference the mapping included in Appendix A of this Environmental and Engineering Assessment.

Between Route 2 and Commonwealth Avenue, the railroad corridor travels between State owned farmlands used by the Northeastern Correctional Center as well as a wooded area adjacent to Warner's Pond and the Reformatory Cemetery (See Sheets 1 - 2 of 9).

Just past the Commonwealth Avenue crossing, the corridor travels alongside MCI-Concord and a mixture of commercial / light industrial uses. The rear of these properties abut the railroad corridor. Uses include a Research and Development (R&D) facility, condos with various commercial tenants, a post office and warehouse facilities. Two of these properties are listed as sites in the DEP BWSC database. No signs of illegal dumping of waste were noted during a walkover of this section of corridor (See Sheets 2 - 3 of 9).

The railroad corridor also traverses the MBTA Commuter Rail (Fitchburg Commuter rail line) and ancillary commuter parking lots in West Concord. The majority of this section of right-of-way is paved. West Concord is a small commercial center with retail, food and convenience establishments, as well as some warehouse facilities. After crossing Main Street in West Concord, the west side of the right-of-way is bordered by residential properties while the east side of the right-of-way abuts a gas station/auto repair shop and car wash. These uses typically present a concern based on their use and proximity to the corridor, however there are no active reports on these sites. The railroad corridor is elevated approximately 2 feet above these adjacent commercial sites and there is no signs of discolored soil or distressed vegetation were noted during the site walk (See Sheets 3 - 4 of 9).

From the Assabet River crossing southward to the Sudbury Town Line, the majority of the railroad corridor travels alongside open space/conservation land, wetland areas and privately owned farmlands intermittent with residential homes / neighborhoods and elementary school property (See Sheets 4 - 9 of 9).

7.3 Screening Results

There is one record for an active or archived Superfund report for the Starmet Corporation at 2229 Main Street. As of April 25, 2005, this site was listed on the Final National Priority List (NPL). The DEP BWSC database indicates that the site has been adequately regulated since 2001. At its closest point, this site is located approximately 1.25 miles west of the rail trail. Based on its location, it is unlikely that this site will impact the project.

The following table and accompanying text presents sites of concern identified during the preliminary screening. The sites are listed in the order in which are they located from north to south.

PRELIMINARY SCREENING RESULTS				
Site Name	**Address**	**Site Status**	**Phase / Class**	**Release Tracking #**
Exxon Station 3-889	503 Commonwealth Ave.	REMOPS	V	3-0003969
MCI Concord	965 Elm St.	RAO	A2	3-0015490
MCI Auto Body Garage	Elm St.	RAO	A2	3-0019124
MCI Building F	Elm St. Rte 2	RAO	A2	3-0001818
Genrad	300 Baker Ave.	RAO	A2	3-0002121
Industrial Property	56 Winthrop St.	LSPNFA		3-0004171
Smith Associates	50 Beharrell St.	DEPNFA		3-0000294
Concord Chrysler Plymouth	135 Commonwealth Ave.	RAO	A1	3-0017278
No Location Aid	7-9 Church St.	Tier II	II	3-0014784
No Location Aid	1201 Main St.	RAO	A2	3-0023224
No Location Aid	1150 Main St.	DPS		3-0015553
Patriot Ambulance	1173 Main St.	RAO	II / A2	3-0000130
Mobil Station 01-154	1112 Main St.	REMOPS	V	3-0003444
South of Marlboro Rd	40 Woodland Rd.	RAO	A2	3-0019053
Utility Pole 35	Williams Rd.	RAO	A1	3-0019329

Source: Massachusetts DEP Bureau of Waste Site Cleanup Searchable Sites Database

503 Commonwealth Avenue: This site is a service/gas station located at the Concord Rotary. It is located approximately 750 feet north of the railroad corridor, separated from the corridor by Route 2 and the MCI-Concord parking lot. The site is classified as REMOPS status, Phase V. REMOPS indicates that a remedial system, which relies upon active operation and maintenance, is being operated for the purpose of achieving a permanent solution. Phase V indicates that long-term treatment processes have been implemented and are being monitored to track cleanup progress. There is no indication that this site would affect this project given reviewed information and its location.

MCI-Concord: Massachusetts Correctional Institute at Concord (MCI-Concord) is a Commonwealth of Massachusetts correctional facility located at the intersection of Route 2 and Commonwealth Avenue, at the Concord Rotary. The MCI-Concord site abuts approximately 2000 linear feet of corridor. The three sites listed at MCI-Concord are all listed as Class A2 RAO. This status means that a Response Action Outcome Statement (RAO) has been submitted. A RAO Statement asserts that the response actions were sufficient to achieve a level of "no significant risk" or at least ensure that all substantial hazards have been eliminated. A Class A RAO means that a permanent solution has been achieved with Class A1, A2, and A3 indicating the subsequent level of contamination. A Class A2 RAO indicates that contamination levels are

above background but below cleanup standards. It is unknown at this time where on the MCI property these releases occurred. This site presents a concern based on reviewed information and this property's proximity to the rail trail.

300 Baker Avenue: This site is a large office and R&D campus, operating as a multi-tenant property with an office building and warehouse/storage building. This property abuts the rear of the MCI-Concord parcel along the Assabet River. A Class A2 RAO indicates that remediation has occurred and remaining contamination levels are above background but below cleanup standards. This site is located on the other side of the Assabet River from the railroad corridor. As river flows away from the corridor in this area, it is unlikely that this site would pose a concern to the project.

56 Winthrop Street: This site is located at the end of Winthrop Street adjacent to the railroad corridor. The parcel is a multi-tenant building now or formerly used for medical and social services. LSPNFA indicates that response actions were conducted and an LSP has determined that no further action was needed for the site.

50 Beharrell Street: This site, owned by West Concord Post Office Square Limited, is located at the rear of Beharrell Street adjacent to the railroad corridor. This complex is a series of buildings used by a wide variety of tenants including, for example, a yoga studio, tea distributor, chimney cleaning company, seafood processing facility and a wool rug office/showcase room. DEPNFA indicates that response actions were conducted and the DEP has determined that no further action was required for the site.

135 Commonwealth Avenue: This site is a Concord Chrysler Plymouth dealership at the corner of Lawsbrook Road and Commonwealth Avenue. A Class A1 RAO indicates that remedial actions have reduced contamination levels to background. As contamination has been brought to a level of no significant risk, it is unlikely that this site would affect the project.

7-9 Church Street: This site is a commercial property at the corner of Commonwealth Avenue and Church Street. It is located approximately 450 feet west of the corridor. This site is classified as a Tier II, Phase II site, which indicates that the site is currently undergoing a Comprehensive Site Assessment under the signature of a licensed site professional (LSP). There is no indication that this site would affect this project given reviewed information and its location.

1201 Main Street: This site is the West Concord Fire Station. Class A2 RAO indicates that remediation has occurred and remaining contamination levels are above background but below cleanup standards. There is no indication that this site would affect this project given available information.

1173 Main Street: This site is owned by Patriot Realty Trust and is a small strip mall with a pet store source and a dry cleaner, approximately 350 feet east of the railroad corridor. It currently is classified as a RAO status, Phase II Class A2 site. Phase II indicates that the site underwent a Comprehensive Site Assessment. Class A2 indicates that remedial actions left contamination levels above background but below cleanup standards. There is no indication that this site would affect this project given available information.

1150 Main Street: 1150 Main Street is a professional office building adjacent to the Assabet River. It is located approximately 625 feet east of the railroad corridor, on the other side of the river. DPS indicates that the site has a Downgradient Property Status (DPS), meaning that the groundwater on that particular site has become contaminated as the result of the former and/or current use of another area site. The source of contamination could presumably be the Mobil gas station at 1112 Main Street, two parcels east of this site. As the river flows away from the railroad corridor in this area, it is unlikely that the indication of contaminated groundwater would pose a concern.

1112 Main Street: This site is a Mobil Station 01-154 at the corner of Baker Avenue and Main Street/Route 62, approximately 900 feet east of the railroad corridor on the other side of the Assabet River. The site is classified as REMOPS status, Phase V. REMOPS indicates that a remedial system, which relies upon active operation and maintenance, is being operated for the purpose of achieving a permanent solution. Phase V indicates that long-term treatment processes have been implemented and are being monitored to track cleanup progress. As the river flows away from the railroad corridor in this area, it is unlikely that this site would pose a concern to the project.

40 Woodland Road: This site is a residential home approximately 800 feet east of the railroad corridor. A Class A2 RAO indicates that remediation has occurred and remaining contamination levels are above background but below cleanup standards. There is no indication that this site would affect this project given available information.

Williams Road: The site is recorded as being at a utility pole along Williams Road. The exact location of this pole is unknown. However, as the railroad corridor crosses Williams Road, this site was included in the search results. A Class A1 RAO indicates that remedial actions have reduced contamination levels to background. As contamination has been brought to a level of no significant risk, it is unlikely that this site would affect the project.

7.4 Conclusion

A review of various database searches did not indicate any overt sources of contamination within the limits of the former railroad corridor itself. However, the review did reveal current or past environmental contamination issues on sites located either directly adjacent to or in close proximity to the railroad corridor.

The most significant site of concern is the MCI-Concord site. Given that the State-owned MCI-Concord property abuts approximately 2,000 linear feet of corridor, it is recommended that the file on this site be reviewed at DEP's offices. Pending the outcome of this review, a more detailed investigation may be needed during the preliminary design phases and/or necessary environmental precautions required during reconstruction activities depending upon the type of work and extent of excavation proposed along this section of corridor.

The West Concord MBTA Commuter Rail Station also poses a concern based on the history and operations occurring at this site. According to the DEP's "Best Management Practices for Controlling Exposure to Soil during the Development of Rail Trails," these relatively small stretches along a right-of-way would be expected to have contamination elevated over the residual levels, due to more frequent/intense use of pesticides to improve sight lines and greater frequency/intensity of human activities. Again, a more detailed investigation may be needed during the preliminary design phases and/or necessary environmental precautions required during reconstruction activities depending upon the type of work and extent of excavation proposed along this section of corridor.

Of recent concern across the state has been the presence of coal ash along former railroad corridors. Coal ash is residual contamination from former railroad operations. This by-product is exempt from the Massachusetts Contingency Plan (MCP). The MCP (310 CMR 40.0000) is the set of regulations that governs the reporting, assessment and cleanup of oil and hazardous material spills in Massachusetts. While, it is acceptable to both leave and re-use soil containing coal ash along a rail trail corridor, the DEP's anti-degradation policy restricts off-site reuse to a similar setting. Consequently, leftover materials may need to be transported to an approved landfill at additional costs to the Contractor, which ultimately increases the overall cost of the rail trail project to the Town. It is therefore important for the rail trail design to balance cut and fill volumes to minimize any transportation of material off-site. It is recommended that the Town test for coal ash when taking the planned soil test holes along the corridor. An independent laboratory should complete the coal ash testing. Confirming the presence of coal ash will allow the Town to utilize this exemption.

This policy does not apply to contamination "hot spots" where contamination other than residual contamination is present. For example, if an oil or hazardous material spill has contaminated the soil along a portion of the corridor, this soil cannot be left or place or re-used and must instead be cleaned up under the MCP.

Bridge demolition and/or removal activities will likely be included as part of this project and therefore there will be lead based paint or lead waste concerns. As documented in the Structures section of this report, the containment and disposal of lead contaminated material is expensive and requires strict compliance with worker and environmental protection regulations. The rail trail construction specifications will need to document proper lead containment, handling and disposal procedures to be followed and account for the costs thereof.

It should be noted that the rail trail construction would not introduce any hazardous waste or contaminated materials to the project area.

8 Cultural and Historic Resources

Local and State data sources were reviewed to identify historic or archaeological sites along the project corridor.

The information gathered from these various sources will:

- Assist the Town and project proponents in addressing community and preservation concerns early in the project planning process
- Help ensure that the project proceeds without causing harm to these important resources

It is unlikely that any historic or archaeological sites will be affected by the rail trail project given the nature of the proposed work. However, appropriate avoidance or mitigation measures can be implemented, if warranted.

In addition, the Town should coordinate with its local and state historical commission to conduct a detailed on-site survey to locate, document and inventory all existing railroad artifacts prior to any rail trail construction or track and tie removal. Photographs, map locations and written documentation from this survey could be used to determine which railroad items are to be saved and incorporated into the future design of the rail trail. The documentation is also important for historical significance and future interpretive signage purposes.

8.1 Local Inventory

The rail trail does not pass through any of Concord's six historic districts and therefore is not subject to the Historic Districts Guidelines established by the Concord Historic Districts Commission.

The "*Survey of Historical and Architectural Resources, Concord, Massachusetts*" (1994) was reviewed to identify any resources adjacent to or near the railroad right-of-way. These resources include sites, structures and other historic, architectural, or archaeologically significant locations. This document was compiled by in-Town volunteers using a number of sources.

The following resources are either adjacent to or near the railroad right-of-way. The accompanying descriptions include excerpts from the documentation included with the Town's survey.

Figure 18: Union Station in West Concord Center

Union Station: Union Station (which now functions as the MBTA Commuter Rail Station) is listed on both the State and National Register of Historic Places (Building #89000143). Union Station, also known as Concord Junction Depot, was constructed in 1893 at the former junction of the Boston-Fitchburg and Framingham-Lowell (Old Colony) railroad lines. It is the only remaining building associated with the railroad in West Concord still intact and located on its original site. The depot played a significant role in transportation history as the junction led to changes in local agriculture and the industrialization and development of West Concord. The structure is the visual focal point of West Concord and a notable example of a Queen-Anne style railroad station. Union Station is listed on Concord's Demolition Delay Bylaw, which requires that owners wait up to six months before implementing any proposed demolition to give the Historical Commission and others time to try to save the structure or at least to document its history.

According to the inventory form, the prehistoric Concord Junction Site (19-MD-469) may exist on the railroad station property. In addition, there are at least 16 prehistoric sites recorded in the general area (within one mile). Given the railroad station's close proximity to the Assabet River and its associated resources, the area would have been attractive for Native American settlement and subsistence. In general, however, the potential for either prehistoric or pre to late nineteenth century railroad associated remains seems low as a result of small parcel size (half acre) and extensive disturbance to the property by the railroad. Archeological resources may exist related to station construction (1893) and its subsequent use.

Warner's Pond: Warner's Pond is one of the most prominent geographic features near Concord Junction. The pond was created in the late 1850's when Ralph Warner, an entrepreneur, raised an existing dam to provide the water power needed to operate his wooden tub and pail factory. Through the second half of the 19th century, Warner's Pond was an important asset to the Concord Junction settlement both for ice businesses and as a recreational center in all seasons of the year. At the outlet at the southeast end of the pond, there are two deteriorated mill dams and the raceway of an early 19th century sawmill, which channel the water under Commonwealth Avenue at the Pail Factory Bridge.

Pail Factory Bridge: The Pail Factory Bridge is an important illustration of an early reinforced concrete bridge (1909). The bridge carries Nashoba Brook beneath Commonwealth Avenue, just east of Warner's Pond. The Brook flowed between Ralph Warner's pail factory to the east and an early 19th century sawmill to the west. The structure represents some of the earliest industrial activity in the Concord Junction area.

Buildings of Concord Junction: The architecture of Concord Junction represents the largest group of late 19th to early 20th century commercial and residential buildings in the western part of Concord. The commercial buildings in this area are modest wood frame, 1-to-3 story structures typical of a rural community during that time period. First known as "Warnerville" after the pail factory and land owned by Ralph Warner, Concord Junction was one of three isolated villages that was joined together to form West Concord. Concord Junction experienced two phases of development. The area experienced a slow, early growth around the Warner's manufacturing complex followed by a building boom prompted by the linking of the Boston-Fitchburg and Framingham-Lowell railroads and subsequent industrial and institutional/reformatory expansion.

Warner Block: Warner Block is a short commercial street of largely wood frame structures built in the late 19th and early 20th century. Warner Block symbolized the early development of Concord Junction by the entrepreneur Ralph Warner. Some of his ventures included the wooden tub and pail factory, improvements to the dam to create the present shape of Warner's Pond, construction of over 20 houses and a hotel, and the sale of 47 acres of land to the State at low cost on which to build the reformatory. Warner Block once housed a small early post office, stores, a lunch counter and offices.

"Commonwealth Row": The repetition of identical house forms houses along Commonwealth Avenue were commonly called Commonwealth Row. Ralph Warner built these double houses in 1877-88 for the Commonwealth of Massachusetts to accommodate prison employees and their families. Inmates laid out the streetscape in this area and assisted with the maintenance of these parcels. Although the exteriors of some of these houses have been altered over time, this section of Commonwealth Row is similar in appearance to how it looked in the 1880's.

Bluine Manufacturing Company: This 20th century three-story wood frame building is sited on a railroad spur track on Beharrell Street in West Concord. The Bluine Company moved its operations from Acton to this building in 1893. The Conant family, a prominent family in the manufacturing and real estate market, grew its mail order bluing business at this location. The building was also occupied by the Wood Publishing Co., which distributed the *Women's Home Journal* (1898) and the Budd Shirtwaist Co. (1905).

Richard Williams House: This house is sited at 45 Williams Road, near where the railroad corridor crosses Williams Road. The structure is of late Queen Anne vernacular style dating back to the pre-1900's and is the only house of its type in the south quarter/nine acre area.

Tarbell Barry House: This house is sited at 475 Old Marlboro Road near its intersection with Harrington Avenue. This house is the farmhouse of one of Old Marlboro Road's nineteenth and early twentieth century farms. It was one of the only farms along this stretch of roadway until the second half of the nineteenth-century. There is also a whitewashed stone barn to the southeast and a plowed farm to the south along the railroad bed of the Framingham & Lowell Railroad. A number of families lived in this house and farmed the land. The railroad's presence made the shipping of milk and produce easier for Concord's farmers. The present structure was constructed after the original farmhouse burned down in 1879, supposedly caused by the sparks from a train.

8.2 State Inventory

A Project Notification Form was submitted to the Massachusetts Historical Commission (MHC) to determine if there are any other historical or archaeological sites along the project corridor.

On June 1, 2005, MHC issued a letter providing requested information on sties within the agency's "*Inventory of the Historic and Archaeological Assets of the Commonwealth"*. This Inventory is a substantial database containing sites, structures, buildings, districts and other properties that have been identified in the Commonwealth and brought to the attention of the MHC. It includes the properties listed in the State Register of Historic Places (local, state, or national designation) as well as thousands of others that may or may not be eligible for listing in the State Register. The response letter is included at the end of this Section.

As noted in the letter, the project area (railroad corridor) passes through or near several Native American archaeological sites recorded in the Inventory. These sites are located in the vicinity of Warner's Pond, Assabet River, Dugan Brook and White Pond. The corridor passes through areas that are archeologically sensitive – areas that are likely to contain as yet undiscovered archaeological sites based on their environmental characteristics and recent finds in similar areas.

MHC requests the opportunity to review preliminary project plans for the rail trail to assess the likelihood that impacted areas may contain archaeological resources and to determine the need for and scope of an archeological investigation of those areas.

The Commonwealth of Massachusetts

William Francis Galvin, Secretary of the Commonwealth
Massachusetts Historical Commission

June 1, 2005

Jennifer A. Shemowat
Project Engineer
Fay, Spofford & Thorndike, LLC
5 Burlington Woods
Burlington, MA 01803

RE: Bruce Freeman Rail Trail Project, Concord, MHC #RC.37137

Dear Ms. Shemowat:

Thank you for submitting a Project Notification Form to the Massachusetts Historical Commission regarding the proposed project referenced above. Staff of the MHC have reviewed the information you submitted and have the following comments.

The proposed route of the Bruce Freeman Rail Trail in Concord consists of a 3.5 mile former railroad right-of-way. This corridor passes through or near several Native American archaeological sites that are recorded in MHC's *Inventory of the Historic and Archaeological Assets of the Commonwealth*. These are located in the vicinity of Warners Pond, the Assabet River, Dugan Brook, and White Pond. In addition, the corridor passes through areas that are archaeologically sensitive, that is, that are likely to contain as yet undiscovered archaeological sites based on their environmental characteristics, such as proximity to water, level or gently sloping terrain, and the presence of known archaeological sites in the immediate vicinity.

MHC requests the opportunity to review plans for the Bruce Freeman Rail Trail as these are developed, especially with regards to proposed parking areas, access routes, or other construction outside the railroad right-of-way corridor. Within the right-of-way, any substantial reconstruction may also be of concern in light of recent finds of intact archaeological sites buried under railroad embankments. This information will be necessary for MHC staff in order to assess the likelihood that the proposed project impact areas may contain archaeological resources, and to determine the need for and scope of an archaeological investigation of those areas.

These comments are offered to assist in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (36 CFR 800), Massachusetts General Laws, Chapter 9, Sections 26-27C (950 CMR 71), and MEPA (301 CMR 11). If you have any questions concerning this review, please feel free to contact me at this office.

Sincerely,

Eric S. Johnson
Archaeologist/Preservation Planner
Massachusetts Historical Commission

xc: Executive Office of Transportation
Concord Historical Commission

220 Morrissey Boulevard, Boston, Massachusetts 02125
(617) 727-8470 • Fax: (617) 727-5128
www.sec.state.ma.us/mhc

9 Trail Design

The design criteria and guidelines established for this rail trail project are based on the following guidelines:

- AASHTO Guide for the Development of Bicycle Facilities (1999)
- ADA Accessibility Guidelines
- Manual on Uniform Traffic Control Devices (MUTCD)

The table below lists the critical design elements and criteria that will be incorporated into the design of the rail trail.

PROJECT DESIGN CRITERIA		
Design Element	**Desirable**	**Minimum/Maximum**
Design Speed (Level or Slight Grade)	20 mph	15 mph
Design Speed (Grade 4%+)	30 mph	
Minimum Path Width	10 ft.	10 ft.; 12 feet
Shoulder	2 ft. at 1:12	
Maximum Grade	5%	12% **
Minimum Horizontal Radius of Curvature (Design speed 32 km/h (20 mph)	100 ft.	
Cross Pitch or Superelevation	1.5% desirable	1.5%; 2% maximum
Stopping Sight Distance		132 ft. for 5% descending grade
Lateral Clearance to steep slope (1:2)	5 ft.	
Lateral Clearance to trees, poles, walls and fences	3 ft.	2 ft.
Lateral Clearance to barriers and railings on structures	2 ft.	No less than clear width on approach
Vertical Clearance for maintenance vehicle access and equestrian safety	10 ft.	8 ft.
Safety Rail Height	42 inches	

** Grades greater than 5% may be used with length restrictions where ADA compliance does not apply. See AASHTO Guidelines and ADAAG.

9.1 Trail Section

The typical cross section of the rail trail will be governed by the existing railroad right-of-way and rail bed width and location of adjacent environmental resources.

In addition to conforming to the criteria above, the design of the rail trail should also:

- Accommodate multiple user types with minimal conflict
- Minimize the amount of cuts and fills along the corridor
- Complement the proposed trail section for the Lowell to Westford portion of the trail (Phase 1). The proposed typical section for Phase 1 is a 10-foot paved surface with 2-foot gravel borrow shoulders.

It is recommended that the Concord rail trail cross section include a 4 to 5-foot shoulder on one side. The widened shoulder will support additional uses including a soft walking/jogging surface and equestrian use. The typical cross-sections for the Lowell to Westford portion of the Bruce Freeman Bicycle Path does not include widened shoulders for equestrian use. However, in Acton, a widened shoulder can be accommodated from the Acton/Concord Town Line north to the Route 27 crossing near Ledge Rock Way in Acton, thereby providing equestrians with access to the Nashoba Brook Conservation Area and an on-road connection to the Town Forest. This shoulder can be reduced to the 2-foot minimum, if needed, to minimize impacts on bordering vegetation, wetlands and adjacent environmental resource areas.

Figure 19: Rail Trail with Widened Shoulder

It may also be feasible to periodically separate the 4 to 5-foot shoulder from the rail trail in certain areas. A physical separation of the two trails will vary the user experience and better accommodate the multiple user types with minimal conflict. This separation could be in the form of a vegetative buffer at the same elevation or by meandering the trail along a side slope, if grades allow. The feasibility of separating the trails will be on a location specific basis depending on the topography, proximity of environmental resource areas and limits of the rail bed, tree line, right-of-way, etc.

Through all sections, a minimum 3-foot offset will be required from the traveled surface to any obstruction (i.e. trees, wood rail fence, etc.) to meet current rail trail design standards. Depending upon the height of the embankment and condition at the bottom of the slope, a wood rail fence may be needed to prevent users from traversing the sideslopes. Vertical clearance to obstructions will need to allow for the passage of maintenance and emergency vehicles.

The rail trail will have a 1.5% cross slope in one direction to aid in drainage. The direction of the cross slope can vary along the corridor depending upon the topography and adjacent land use. A 1.5% cross slope is the same as a typical sidewalk and meets ADA accessibility guidelines.

The EOT has indicated its support for removing the tracks and ties along the entire length of the corridor for design, safety and liability reasons. The EOT noted, however, that other considerations may impact the final decision with respect to removal of the rail infrastructure. These considerations would be more fully developed in the context of the title review and proposed disposition of the property for the proposed alternative transportation use.

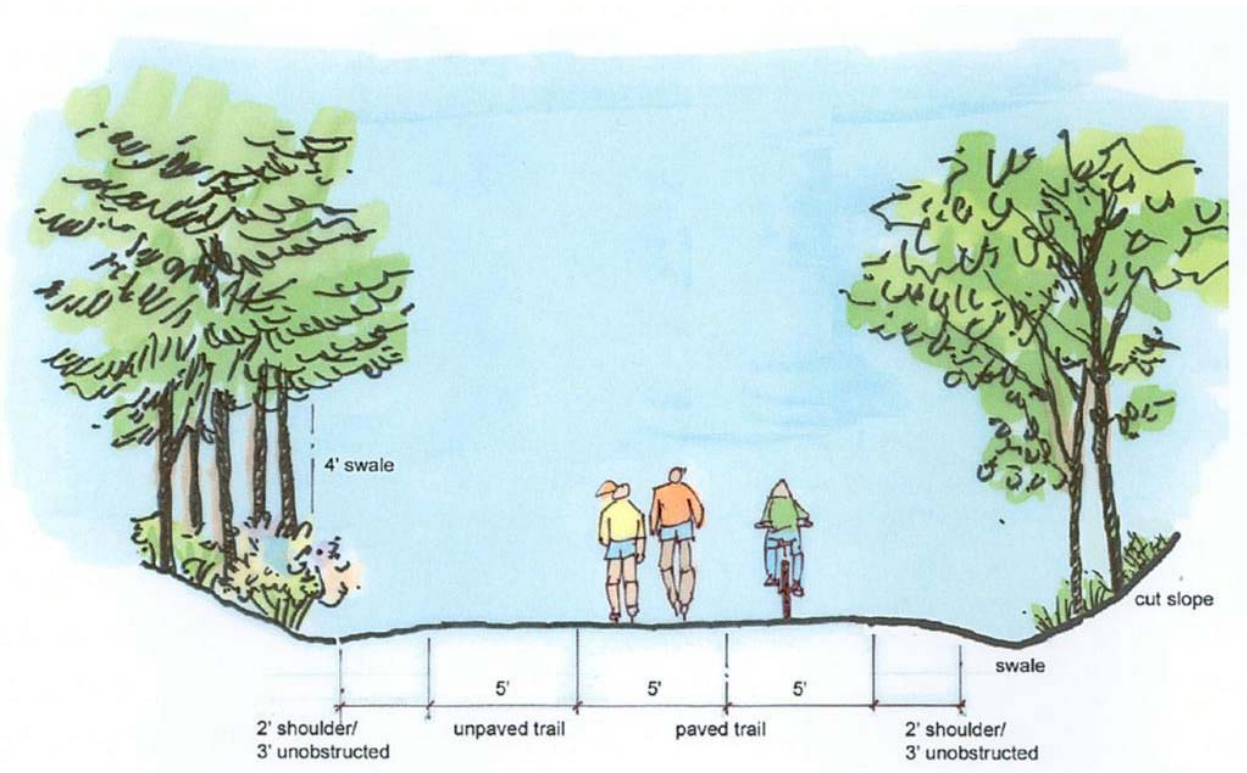


Figure 20: Typical Rail Trail Section in Cut

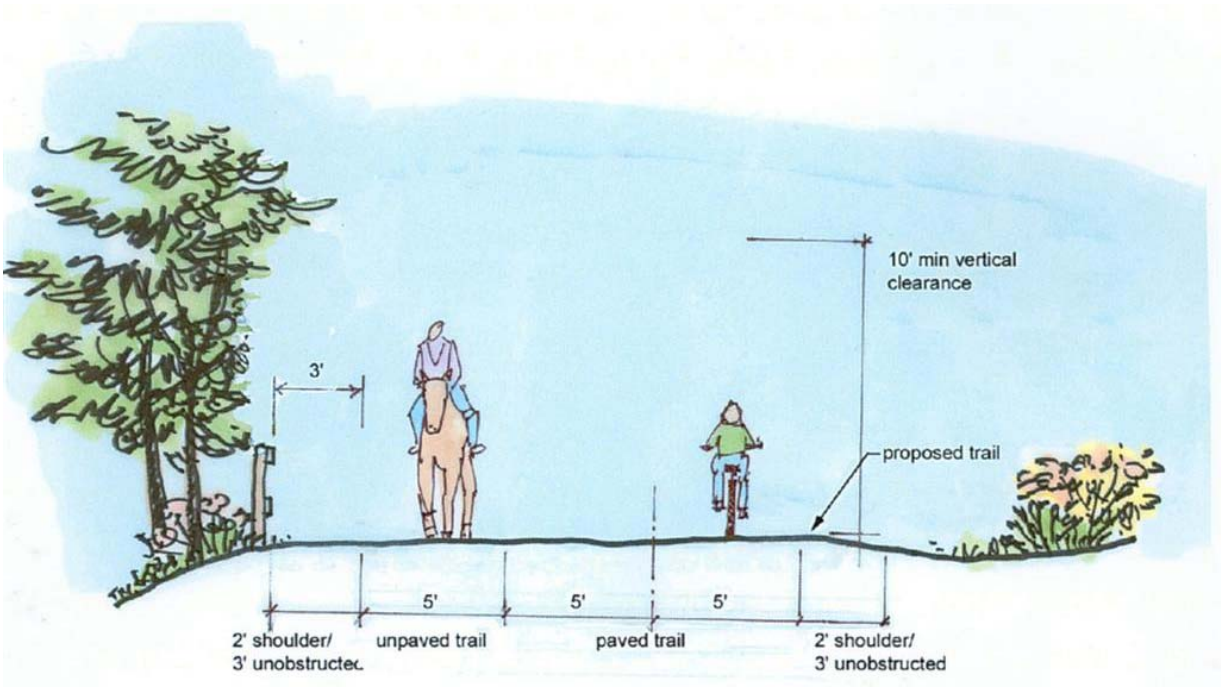


Figure 21: Typical Rail Trail Section in Fill

9.2 Trail Surface Materials

Another important consideration in rail trail design is the type of surface that will be provided. The selection of a surface material depends on the anticipated type and intensity of path use, terrain, climate, design life, maintenance, cost and availability.

Rail trails are increasing in popularity as an alternative form of transportation and as facilities suitable for all user levels. The majority of these users prefer the benefits of smooth, hard surfaces. On the other hand, soft surface materials are low cost, but require substantial maintenance and are more suitable to mountain bikes than road bikes, prohibit use by rollerbladers and may cause some difficulty for the physically-challenged. The soft surface is often preferred by runners and walkers. If federal funds are used for construction, the path surface must meet Americans with Disabilities Act Accessibility Guidelines (ADAAG) that require that the surface material be “stable, firm and slip-resistant.”

FST recommends use of a paved bituminous concrete surface (i.e. hot mix asphalt) for funding, durability, user friendliness and ease of maintenance. EOT has favored paved surfaces on its rights-of-way. Transportation Enhancement (TE) funding, administered by MassHighway, has prioritized paved surface rail trail projects in the past. It is FST’s understanding that MassHighway has recently decided to conduct a pilot project to assess other types of rail trail surface materials. However, to-date, FST is unaware of any MassHighway funded rail trails other than those with bituminous concrete surfaces. Nonetheless, the Town can consider the appropriate trail surface material option for the community.

The following is a brief description of some of the available surface materials used in rail trail construction:

Bituminous Concrete: From a maintenance and construction perspective, bituminous concrete or hot mix asphalt is a durable material that permits ease of placement and compaction. A bituminous concrete surface has a much longer lifetime than other materials, such as stone dust. The Cape Cod Rail Trail is just now being resurfaced after more than 20 years of use.

Porous Pavement: Porous pavement is the open graded friction course (OGFC) often used on interstate highways. There are several types and vendors of OGFC. This mixture is a top course that is comprised of mostly 3/8" stone and designed for water to pass through the top and drain along intermediate course to the edge of pavement. It works well on high speed roadways where fast-spinning tires assist in moving water through the stone matrix. There have been documented failures on slow speed roads where water, road salt, and sand have clogged these "pores" thus resulting in raveled pavement. Also, generally for each 1% over an 8% air void content, a pavement will see a 10% service life reduction due to sun exposure/oxidization (i.e. 10% air void content would reduce 20-year pavement design to 16 years). OGFC results in a 20% service life reduction. OGFC generally costs 10 to 15% more than bituminous concrete/hot-mix asphalt due to higher liquid binder content. FST’s Asset Performance Management Specialist does not see the benefit of using OFGC over traditional pavement for a rail trail.

Flexible Pavers: There are other flexible paver surfaces available, but those are substantially more costly than bituminous concrete, are difficult to work with and the method of application is more difficult. If constructed properly, these flexible pavers or “soil stabilizer” can be ADA compliant.

Crushed Stone or Stone Dust: A crushed stone or stone dust mixture is placed on a compacted base, separated by a geosynthetic liner. These surfaces are highly dependent upon underlying soil suitability and drainage patterns as they are highly susceptible to rutting and washouts, even with a geosynthetic liner. These surfaces require a higher level of maintenance than a smooth, regular surface material. Crushed stone or stone dust surfaces also limit the types of user activities.

10 At-Grade Intersection Treatments

Another design issue is the treatment of the proposed rail trail where it crosses streets at-grade. The creation of midblock crossings presents operational and safety issues for both vehicles and bicycle path users.

The rail trail should be aligned to meet the intersecting roadway at a 90-degree angle or at an angle as close to 90 degrees as can be obtained while maintaining minimal disturbance to the existing rail bed and surrounding areas, especially when bordering wetlands or private property would be affected.

It is recommended that a horizontal alignment featuring reverse curves approaching the roadway intersection be developed at each crossing. Benefits of such a realignment include a shortened crossing and increased awareness by rail trail users of a change in conditions (i.e. an approaching intersection). Typically, this realignment consists of short, reverse curves to divert the rail trail from the current track alignment and reposition the user at the preferred crossing location. A typical detail of this rail trail / roadway intersection treatment is included at the end of this Section.

Traffic calming techniques, proper warning and regulatory signage and pavement markings will be utilized to improve safety conditions for both path users and drivers as outlined in the MUTCD. To avoid user conflicts at intersections and to prevent access by motor vehicles, a bollard would be provided which could be removed for emergency access.

Figure 22: Example Imprint© Application

The Town's Engineering Department has indicated that they would like to use Imprint© paving for crosswalks at the rail trail / roadway crossings. Imprint© is a decorative surfacing system which offers both aesthetic and traffic calming benefits. It is a hot-applied, synthetic bitumen compound imprinted with a pattern (available in various patterns and colors). As part of this project, the Town should consider replacing the brickwork at Concord Junction with Imprint© for consistency and maintenance reasons. The cost of this treatment has been included in the budgetary construction cost estimate. A photo example of an Imprint© crosswalk is shown to the left.

10.1 Accident History

As a part of assessing the safety of the rail trail / roadway crossings, MassHighway crash data for the three-year period from 2000 to 2002 was reviewed. This data is an annual compilation of data for accidents reported to the local police departments and the Massachusetts Registry of Motor vehicles. Among the information included for each accident in this database is the location, type and severity of the accident. Data was reviewed to identify accidents at or near rail trail crossings involving pedestrians or bicyclists.

Over the three-year period from 2000 to 2002, there were a total of 12 reported motor vehicle accidents involving bicyclists and pedestrians within Concord. None of these accidents resulted in fatalities. Of the reported 12 accidents involving bicyclists and pedestrians, only one of the accidents was within the study area. The accident occurred 100 feet east of the intersection of Main Street/Route 62 and Commonwealth Avenue in West Concord in December 2003. A car traveling westbound struck a pedestrian, but no injuries were reported.

10.2 Intersections

The following tables discuss each crossing in more detail and outline the deficiencies and general engineering considerations that will need to be taken into consideration during the design phase. Items such as sight distance, grading, etc. will all have to be examined in more detail before specific designs for the necessary level of protection at these crossings can be developed.

Traffic data presented in this Section was compiled from the Commonwealth of Massachusetts Office of Transportation Planning Road Inventory Database and supplemented with field observations.

10.2.1 Commonwealth Avenue

Figure 23: Looking North Along Corridor

Figure 24: Looking South Along Corridor

Description:
Commonwealth Avenue is the main thoroughfare between Route 2 at the Concord Rotary and West Concord Center at Route 62. The railroad corridor crosses at Commonwealth Avenue at approximately a 30-degree angle and runs adjacent to MCI-Concord.

Type of roadway:	Urban Collector
Posted speed:	30 mph
Jurisdiction:	Town accepted road
Volume (ADT):	3,000 vpd
Road width:	32 feet with 2-foot shoulders
Angle:	30 degrees
Existing deficiencies:	▪ Proximity of residential driveway and MCI-Concord access road and security fence may restrict the ability to realign the trail to a 90 degree crossing
Recommendations:	▪ Realign the rail trail to bring the crossing as close to 90 degrees as can be obtained at this location

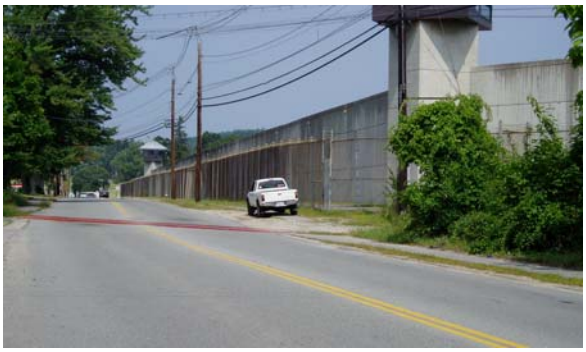


Figure 25: Looking East Along Commonwealth Avenue Toward Route 2

10.2.2 Main Street (Route 62)

Figure 26: Pedestrian Crossing #1
Commonwealth Avenue at Main Street (Route 62)

Figure 27: Pedestrian Crossing #2
Commonwealth Avenue at Main Street (Route 62)

Description:
Commonwealth Avenue intersects Main Street (Route 62) at a "fork" in the center of West Concord. West Concord is a commercially developed area that sees a lot of thru traffic for motorists traveling to/from Acton and Maynard from Route 2.

There is a signalized intersection with two separate pedestrian crossing locations. One crossing brings pedestrians directly across the intersection at the point where the two roads intersect. The second crossing provides refuge for pedestrians halfway across the intersection to a narrow brick island in the center of the "fork."

The railroad corridor alignment goes straight across the intersection between the two pedestrian crossing locations. Without modifications to this intersection, it is anticipated that some users will try to "cut across" the intersection, avoiding crosswalks, thereby creating a dangerous situation for users and motorists.

Type of roadway:	Urban Principal Arterial
Posted speed:	20-25 mph
Jurisdiction:	Town accepted road
Volume (ADT):	11,100 vpd
Road width:	64 feet at widest point with sidewalks along both sides
Angle:	65 degrees (Main Street) 50 degrees (Commonwealth Avenue)
Existing deficiencies:	▪ Proximity of commercial driveways and abutting land uses restrict the ability to realign the trail on the northern approach
Recommendations:	▪ Provide one improved pedestrian crossing along the rail trail alignment ▪ Eliminate use of the center island for pedestrian refuge and instead use solely for physical separation of the roadways at the "fork" ▪ Modify the signal system to improve safety conditions for rail trail users

10.2.3 Old Marlboro Road

Figure 28: Looking South Along Corridor (South Meadow Ridge to Left)

Figure 29: Looking North Along Corridor

Description: Old Marlboro Road is a primary thoroughfare to Sudbury and points south. The crossing is located in a densely vegetated residential area.	
Type of roadway:	Urban Collector
Posted speed:	30 mph
Jurisdiction:	Town accepted road
Volume (ADT):	3,000 vpd
Road width:	22 feet with 2-foot shoulders and a sidewalk along both sides
Angle:	25 degrees
Existing deficiencies:	▪ Proximity of entrance to South Meadow Ridge residential development (100 vpd)
Recommendations:	▪ Realign the trail so that users cross at a 90-degree angle to Old Marlboro Road as close to South Meadow Ridge as possible. A crossing at this location will lessen the likelihood of turning vehicle and trail user conflicts.

10.2.4 Williams Road

Figure 30: Looking South Along Old Marlboro Road at Williams Road

Figure 31: Looking North Along Corridor

Description:
Williams Road is a residential area between the arterial roadways of Old Marlboro Road and Old Road to Nine Acre Corner (ORNAC). The crossing is located in a densely vegetated residential area, where Williams Road intersects with Old Marlboro Road.

Type of roadway:	Local
Posted speed:	30 mph
Jurisdiction:	Town accepted road
Volume (ADT):	700 vpd
Road width:	18 feet with 2-foot shoulders
Angle:	90 degrees (approx.)
Existing deficiencies:	▪ Located at the intersection of Williams Road with Old Marlboro Road ▪ In close proximity to a residential driveway on the northeast side of the crossing
Recommendations:	▪ Consideration should be given to reverse curves approaching the roadway intersection. ▪ A horizontal alignment featuring reverse curves should be developed at this intersection. ▪ Additional warning and regulatory signage needs to be installed along Old Marlboro Road to warn motorists turning onto Williams Road of the rail trail crossing.

10.2.5 Powder Mill Road

Figure 32: Looking West Along Powder Mill Road (Above Rail Corridor)

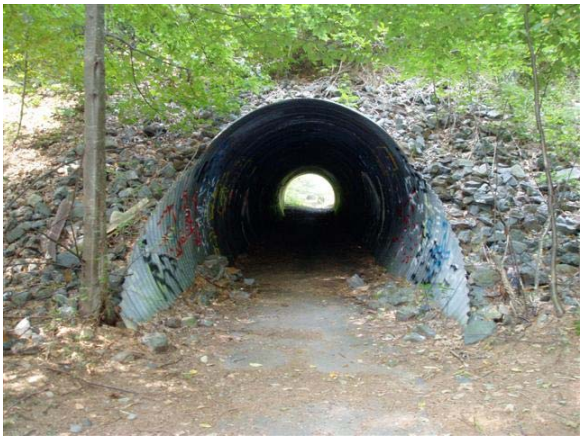


Figure 33: Existing Corrugated Metal Pipe Underpass

Description: The crossing at this location is grade separated by means of a corrugated metal pipe / tunnel beneath the roadway.	
Type of roadway:	Local
Posted speed:	30 mph
Jurisdiction:	Town accepted road
Volume (ADT):	700 vpd
Road width:	22 feet with 2-foot shoulders and sidewalk along north side
Angle:	90 degrees (approx.)
Existing deficiencies:	▪ Refer to Structures Section of this report.
Recommendations:	▪ Refer to Structures Section of this report.

10.3 MBTA Parking Lot

The north-south Lowell Secondary Track railroad corridor crosses the active MBTA Commuter Rail at Concord Junction Depot, in the heart of West Concord. On the north side of the rail junction is the MBTA commuter parking lot, on the south side is a small public park and pedestrian walkway (See Sheet 3 of 9).

Figure 34: MBTA Commuter Parking Lot Looking South Along Rail Corridor

Figure 35: Existing At-Grade Pedestrian Crossing Looking South Along Rail Corridor

The rail trail might follow the alignment of the Lowell Secondary Track, through the MBTA commuter parking lot. It would then cross the active MBTA Commuter Rail in West Concord center at the existing at-grade pedestrian crossing, as shown in the photos above. A license agreement for this use was granted to the MBTA by the EOT in April 1991, as discussed in the Railroad Right-of-Way Section of this report.

FST's site reconnaissance revealed that there few, if any, other practicable or preferable routing alternatives in the general station area. In follow-up, the consultant scheduled a meeting with the MBTA and EOT to discuss the rail trail crossing of the commuter parking lot and active tracks at the West Concord MBTA Commuter Rail Station. Attendees at this meeting included the Town's Consultant (FST), MBTA Director of Planning, MBTA Director of Real Estate and an MBTA Project Manager - Planning Dept. and the EOT's Manager of Alternative Transportation, Property Manager - Rail Unit and Bicycle-Pedestrian Program Manager. Town of Concord staff were not in attendance at this meeting.

The joint issues discussed at the meeting included:

- Provision a safe and continuous bicyclist and pedestrian route through the area;
- Minimizing conflict with vehicular circulation in the parking lot;
- Improving existing signage and physical control at the rail crossing; and
- Implementing rail trail user regulations to indemnify the MBTA.

As a result of the items discussed at this meeting, the MBTA suggested that the Town submit a formal request to the MBTA describing the Town's interest in constructing a rail trail through the West Concord Station area. The letter should request approval to further consider a rail trail crossing of the active tracks and include accompanying graphics to clearly illustrate the rail trail alignment along with the existing and proposed conditions on land used by the MBTA. Upon receipt of this letter, the MBTA will begin an internal canvass and review process of the Town's request. The agency will seek input from its respective departments, including, but not limited to: Real Estate, Operations, Safety, Planning, Design & Construction and Revenue. An on-site

meeting will likely occur as part of the MBTA's review process, of which the Town will also be notified. The MBTA will issue a response letter to the Town once the agency has completed its review. It is advantageous for the Town to submit this request as part of the Town's preliminary study to allow the MBTA ample time to review and comment prior to the preparation of design plans.

A copy of this letter, without the exhibits, is contained at the end of this Section. Regardless of the status of this letter, the Town should continue to closely coordinate with the MBTA to reach a mutually satisfactory and safe solution.

Recommendations:
A multi-modal link at the West Concord MBTA Commuter Rail Station is essential. However, this link must be designed to balance the safety and mobility of station and rail trail users. The rail trail design through this area consists of two elements: its routing through the property and its crossing of the MBTA tracks.

Route:
The primary considerations in developing the final routing arrangement are to:

- Evaluate how to safety bring trail users through the commuter parking lot
- Determine the resulting impact, if any, on vehicular circulation

The design should seek to allow for the shared use of the parking lot by motorists and rail trail users. The parking lot within the Lowell Secondary right-of-way is rectangular, with two rows of parking spaces (approx. 9 feet by 18 feet) and a center travel lane (approximately 24 feet. wide).

A low-cost design option with minimal physical impact would be to delineate a rail trail route segment through the parking lot with pavement markings, signage or special pavers. For example, the route could be painted a solid color supplemented with a bike stencil, similar to a bike lane. This route segment would provide a defined linear extension of the rail along the length of the parking lot. This lane would serve two purposes. First, it would help guide rail trail users through the parking lot and secondly, it would warn motorists about the presence of rail trail users. Safety concerns still remain related to rail trail user / vehicle conflicts, especially motorists backing their vehicles into this lane when trail users are present. While this problem cannot be prevented, it can be mitigated with additional signage directed at both motorists and rail trail users, using colored pavement or painting the lane a solid color to raise awareness. Locating this lane along the center of the parking aisle will improve motorist's visibility of trail users and provide additional time for motorists/users to safely react to a potential conflict.

Additional safety guidelines could be implemented in the station area to require rail trail users to dismount and walk through, as opposed to ride through, the station area. However, this guideline would be difficult to enforce. This issue will likely be considered as part of the agency's internal canvass and review process, especially in terms of indemnifying the MBTA from liability.

Although, routing the trail through the parking lot is a feasible alternative, it would be preferable to provide a physical separation between parked cars and the rail trail. This separation would likely require some modifications of the current parking lot layout (i.e. reducing the aisle width and shifting a parking row). Another option could be to bring the rail trail along the railroad spur track shown in the photo to the right. This spur track would bring rail trail users from the northern

Figure 36: Looking South Along Spur Track

end of the commuter parking lot close to the existing gate controlled crossing of the active rail line at Commonwealth Avenue. However, it must still be recognized that rail trail users will seek to find the most direct route through this area, which in this case would be to travel straight through the parking lot. The feasibility of these options will need to be further evaluated when more detailed survey is available. During the preliminary design phase, it is also recommended that a traffic study be conducted to document current circulation patterns in the parking lot and investigate changes to improve safety on this segment of the trail.

The rail trail design in this area must accommodate an access easement granted to VOA Concord Assisted Living, Inc. This easement provides vehicular access and utility rights across the commuter parking lot to the Concord Park facility (on the west side of the right-of-way). Stop signs currently control this cross connection. This easement agreement was granted to VOA by the EOT in March 2001, as discussed in the Railroad Right-of-Way Section of this report.

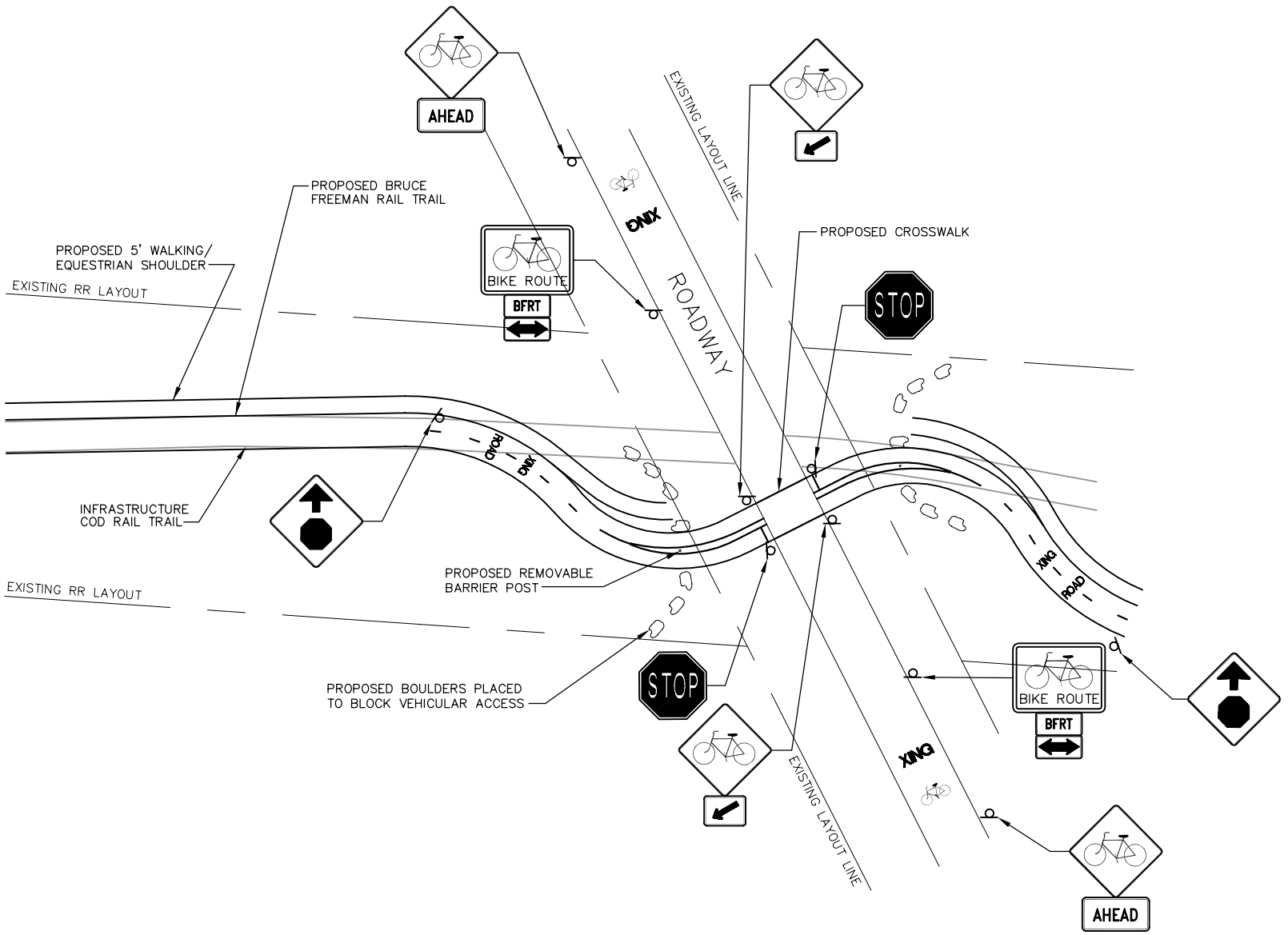
Crossing:

The primary considerations in evaluating a rail trail crossing of the active line are to:

- Determine the feasibility of utilizing the existing at-grade pedestrian crossing
- Assess the adequacy of existing physical controls at this location

The existing pedestrian crossing at the station is an at-grade crossing between the inbound and outbound platforms in the center of the station. The commuter trains stop directly at the crossing to discharge and pickup passengers. Existing signage at the crossing instructs users to "Look Before Crossing." Additional signage and markings could be added at this location to formally state and require rail trail users to dismount and walk across the at-grade crossing and to direct trail users through the station property.

Black iron fencing between the inbound and outbound tracks acts as a physical control to restrict people to cross at the designated location. The rail trail will bring increased pedestrian and bicyclist traffic through this crossing. The MBTA may require special safety controls be erected at this crossing as part of the rail trail design. Such controls and other safety considerations will likely be considered as part of the agency's internal canvass and review process in response to the Town's letter. In accordance with the Town's June 25, 2005 letter to the MBTA, it is recommended that a study of pedestrian control devices for crossings of active railroad tracks be conducted to determine an appropriate treatment to improve the safety of users at this crossing.



BRUCE FREEMAN RAIL TRAIL / ROADWAY INTERSECTION

TYPICAL TREATMENT TO IMPROVE SIGHT DISTANCE AND SAFETY AT INTERSECTIONS

NOT TO SCALE

FAY, SPOFFORD & THORNDIKE, LLC
ENGINEERS • PLANNERS • SCIENTISTS
BURLINGTON, MA

OLD NORTH BRIDGE

TOWN OF CONCORD

TOWN MANAGER'S OFFICE
22 MONUMENT SQUARE - P.O. BOX 535
CONCORD, MASSACHUSETTS 01742

TELEPHONE (978) 318-3000
FAX (978) 318-3002

June 24, 2005

Mr. Mark Boyle, Director of Real Estate
MASSACHUSETTS BAY TRANSPORTATION AUTHORITY
10 Park Plaza, Room 5750
Boston, MA 02116

Subject: **Bruce Freeman Rail Trail Project - Concord Section**
Town of Concord, Massachusetts

Dear Mr. Boyle:

The Town of Concord is considering a multi-use path (or rail trail) along the former Lowell Secondary Track right-of-way. This trail, known as the Bruce Freeman Rail Trail, would extend from the Acton / Concord town line (just north of Route 2) to the Sudbury Town Line for a distance of approximately 3.5 miles. The railroad right-of-way is owned by the Commonwealth of Massachusetts, under the care and control of the Executive Office of Transportation (EOT). At this time, the project is at the study phase. An *Environmental and Engineering Assessment report* is being prepared by our consultants, Fay, Spofford & Thorndike (FST,) to determine the feasibility of developing a rail trail along the Concord section of former railroad right-of-way. We are contacting the MBTA as part of this *Assessment* so that we can address the rail trail crossing of the active MBTA Commuter Line and Commuter Parking Lot in West Concord as early as possible in the project planning process.

The north-south Lowell Secondary Track right-of-way corridor crosses the active MBTA Commuter Line in West Concord center. On the north side of the rail junction is the MBTA commuter parking lot, on the south side is a small public park and pedestrian walkway. Following the alignment of the Lowell Secondary Track, the rail trail will travel through the MBTA commuter parking lot and cross the active commuter line in West Concord center at the existing at-grade pedestrian crossing. This alignment is shown on the attached project mapping (Exhibit 1) and site visit photos (Exhibit 2). A site reconnaissance effort by FST revealed that there are no other practicable or substantially better routing alternatives in the general station area given available information.

The MBTA parking lot is situated within the Lowell Secondary Track right-of-way, from approximately Valuation Station 607+18 to Station 613+42 (Exhibit 3). This parcel contains about 24,800 square feet of land. On April 4, 1991, the EOT granted a license agreement to the MBTA to permit the agency to use and maintain this portion of right-of-way for commuter parking purposes. A copy of this agreement is attached hereto (Exhibit 4).

The purpose of this letter is to request that the MBTA review and provide input regarding the Town's intent to:

1. *Align the rail trail through the MBTA commuter parking lot using, for example, pavement markings, signage or special pavers.* The design of this route will seek to minimize conflict with vehicular circulation in the parking lot.

2. *Utilize the existing at-grade pedestrian crossing of the active rail line at the West Concord Station platform.* The design of this crossing may require the installation of additional safety controls to account for increased bicyclist and pedestrian volumes at this location.

The Town shares the MBTA's concern for providing safe and continuous access through the West Concord Station area for all users. However, we also recognize that this intermodal connection is a critical component in the local and regional rail trail project. This project will provide improved access to the MBTA system while serving to invite new riders onto the transit system from communities along the rail trail corridor. When complete, the rail trail will provide an alternative means of transportation for users from Lowell to Framingham.

Thank you for your consideration of this request and we look forward to your response. Please do not hesitate to contact me at 978-318-3000 or via e-mail at <cwhelan@concordnet.org> with any questions or comments regarding this request.

Sincerely,

Christopher Whelan
Concord Town Manager

Enclosures (4)

11 Structures

11.1 Railroad Bridges

There are three rail trail crossings of flowing waters along this corridor:

- Bridge No. 13.86 - Nashoba Brook
- Bridge No. 14.81 - Nashoba Brook
- Bridge No. 15.16 - Assabet River

A visual assessment of bridge structures and abutments was conducted along the corridor. Each of the two bridges over Nashoba Brook are of different construction. The Assabet River bridge deck is no longer intact as it was removed after a young boy fell off the bridge.

A visual inspection of the three crossings indicated that the granite abutments are still intact and in good condition. The proposed structures are typically designed for an H10 truckload. H10 is a light truck, such as a standard maintenance, construction or emergency vehicle, with a rear axel weighing 16,000 pounds. This loading is much less than the original railroad loading and should permit reuse of the existing stone abutments. A unit cost per bridge for abutment rehabilitation is included as part of the construction cost estimate.

Many elements affect the design of rail trail bridges. Aesthetics may influence the choice of materials and the type of structure. Costs are important not only from the standpoint of construction, but also from the standpoint of annual maintenance and repair, and the expected life of the structure before replacement is required.

Four alternative structure types were considered at each location, as appropriate:

- Alternative 1 - Reuse of Existing Bridge Structure
- Alternative 2 - Prestressed Concrete Bridge
- Alternative 3 - Installation of a Prefabricated Bridge
- Alternative 4 - Concrete Deck Bridge on Steel Stringers

Each alternative makes use of the existing railroad abutments. The EOT has indicated that they do not have a preference regarding the proposed rail trail bridge type, as long as the end product is a safe structure.

Alternative 1 - Reuse of Existing Bridge Structure

Alternative 1 consists of reusing the existing steel stringers and installing new decking. The decking would be a concrete deck with a bituminous concrete trail surface. A wood rail fence can be mounted to the concrete deck.

This alternative presents particular environmental constraints because of the need to clean and delead the existing steel stringers prior to applying new paint. Encapsulation is necessary to prevent lead emissions into the environment, as lead is a known air, soil, and water pollutant. Encapsulation methods must be employed to contain and recover paint and debris generated during cleaning and deleading operations. The containment and disposal of lead contaminated material is expensive and requires strict compliance with worker and environmental protection regulations. Improper lead containment and disposal has resulted in large fines by regulatory agencies. Based on recent cost estimates from other projects, the cost of lead paint removal was estimated to be $40,000. This cost includes full compensation for all labor, equipment, containment and disposal of cleaning residue, removal and disposal of debris, progress reporting, and all other incidental work thereto.

Testing for lead paint on the steel stringers was not completed as part of this study. It is possible that the paint may have worn away from the steel over time, thus reducing the work effort required for lead paint removal and making encapsulation a more viable option from a cost perspective. However, lead testing will need to be completed during the design stages of the project to verify the extent of lead paint on each bridge and more accurately quantify the scope of deleading operations.

This reuse of the existing structure is a labor-intensive activity due to the lead paint removal operations. The painted steel stringers will require periodic repainting.

Alternative 2 - Prestressed Concrete Bridge

Alternative 2 consists of butted prestressed concrete deck beams with a bituminous concrete wearing surface. The concrete beams are laid lengthwise, supported on the existing granite abutments and secured on a concrete seat. A wood rail fence can be mounted to the concrete beams.

The concrete beams can be quickly erected. This type of bridge also has low maintenance requirements.

Alternative 3 - Installation of a Prefabricated Bridge

This alternative consists of a prefabricated truss-type steel bridge with a concrete wearing surface. The top chord of the truss will be curved to provide an aesthetically pleasing bridge. This type of bridge more closely replicates an old railroad bridge. Vinyl-coated chain link fabric will be provided between the deck surface and the top chord. A timber rub rail will be mounted on the truss. There are a variety of truss types and materials available, with some styles being slightly more expensive than others. The truss and web member styles vary by manufacturer.

The erection of the prefabricated superstructure is the quickest of the bridge alternatives. These bridges come completely fabricated for easy installation and reduced onsite construction costs. Periodic repainting of the steel members will be required. Weathering steel, which does not require painting and is a rich brown color, may also be used.

Alternative 4 - Concrete Deck Bridge on Steel Stringers

This alternative consists of a concrete deck constructed on steel stringers. This bridge type is similar to a highway bridge with the concrete deck supported by steel I-beams.

A photo simulation technique was used to illustrate the conceptual design alternatives for the bridges. These simulations show design options, recognizing that there are various other combinations of rail trail bridge types and railing systems that can be used. Each of the alternatives utilizes the existing granite cut stone abutments.

A photo composite of each of the proposed rail trail bridges is included at the end of this Section. A table comparing the budgetary construction costs of each feasible alternative is included in the following sections.

11.1.1 Bridge No. 13.86 (Nashoba Brook Bridge)

Description:

- Located 350± feet south of Route 2
- Span length of 25± feet
- Timber deck made up of 9” x 9” timber railroad ties placed transversely across two steel stringers
- Granite cut stone abutments appear to be in good condition

The NA&B track was removed in the late 1920's and the remaining Lowell Secondary Track was not relocated on the segment of right-of-way between West Concord and the first crossing of Route 27 in North Acton. The granite abutments were constructed to support the Lowell Secondary Track and former NA&B track and therefore extend a greater width of the right-of-way.

Cost Comparison of Alternatives:

ALTERNATIVE 1: Reuse of Existing Bridge Structure Bridge No. 13.86 - Nashoba Brook				
Work Description	**Unit**	**Quantity**	**Unit Price**	**Cost**
Concrete Deck and Curb	CY	12	$1,200	$14,400
Railing	LF	50	$60	$3,000
Clean and Paint Steel	LS	1	$40,000	$40,000
			Subtotal	$57,400
			Contingencies (20%)	$11,480
			Total	$68,880
			Budget	$70,000

ALTERNATIVE 2: Prestressed Concrete Bridge Bridge No. 13.86 - Nashoba Brook				
Work Description	**Unit**	**Quantity**	**Unit Price**	**Cost**
Railing	LF	50	$60	$3,000
Prestressed Deck Beams	LF	100	$150	$15,000
Modify Abutment	CY	1	$1,500	$1,500
Demolition of Railroad Bridge	LS	1	$10,000	$10,000
			Subtotal	$29,500
			Contingencies (20%)	$5,900
			Total	$35,400
			Budget	$40,000

ALTERNATIVE 3: Prefabricated Bridge Bridge No. 13.86 - Nashoba Brook				
Work Description	**Unit**	**Quantity**	**Unit Price**	**Cost**
Prefabricated Bridge	LS	1	$50,000	$50,000
Modify Abutment	CY	1	$1,500	$1,500
Demolition of Railroad Bridge	LS	1	$10,000	$10,000
			Subtotal	$61,500
			Contingencies (20%)	$12,300
			Total	$73,800
			Budget	$75,000

Recommendation:
It is recommended that the existing railroad bridge (Bridge No. 13.86) over Nashoba Brook be removed and replaced with a prestressed concrete box beam bridge (Alternative 2).

During the design phase, structural engineers will need to inspect the bridge and determine the areas of work in need of bridge rehabilitation. It is assumed that the existing bridge contains lead paint and therefore special provisions will need to be prepared for its safe removal.

11.1.2 Bridge No. 14.81 (Nashoba Brook Bridge)

Description:

- Located 800± feet north of the MBTA Commuter Rail
- Span length of 70± feet
- Concrete deck with steel stringers
- Granite cut stone abutments appear to be in good condition

According to the Valuation Maps and field reconnaissance, the segment of corridor between Commonwealth Avenue (near MCI Concord) and the West Concord station had three (3) separate tracks which spurred into as many as seven (7) tracks where it intersected the Boston & Maine Railroad. Bridge No. 14.81 has a concrete deck supported by steel stringers that rest on granite cut stone abutments. The bridge carries a total of three (3) tracks across Nashoba Brook and appears to be in good condition.

Cost Comparison of Alternatives:

ALTERNATIVE 1: Reuse of Existing Bridge Structure Bridge No. 14.81 - Nashoba Brook				
Work Description	**Unit**	**Quantity**	**Unit Price**	**Cost**
Concrete Curb	CY	11	$1,200	$13,200
Railing	LF	140	$60	$8,400
Clean and Paint Steel	LS	1	$80,000	$80,000
			Subtotal	$101,600
			Contingencies (20%)	$20,320
			Total	$121,920
			Budget	$125,000

Recommendation:
It is recommended that the existing concrete deck bridge (Bridge No. 14.81) over Nashoba Brook be rehabilitated (Alternative 1). Replacing this bridge with a prefabricated bridge would require work within Nashoba Brook to remove the concrete piers. This work would result in additional environmental permitting requirements.

Additional work will include removing the existing fill over the bridge deck, placing a waterproof membrane on the deck and constructing a new sub-base with a bituminous concrete trail surface. Graffiti will need to be removed from the wingwalls and abutments and an anti-graffiti coating applied.

During the design phase, structural engineers will need to inspect the bridge, prepare a rating report and determine the areas of work needed to rehabilitate the bridge for the rail trail. It is assumed that the existing bridge contains lead paint and therefore special provisions will need to be prepared for its safe removal.

11.1.3 Bridge No. 15.16 (Assabet River Bridge)

Description:

- Located 700± feet south of Commonwealth Avenue/Route 62 intersection
- Span length of 90± feet
- No existing bridge; Removed after a young boy passed away at this location
- Former bridge carried one track
- Granite cut stone abutments appear to be in good condition
- Chain link fencing installed along the abutments due to safety concerns

A bridge along any rail trail should be a unique event as well as a focal point that can change the entire character of the path. This bridge will be particularly impressive, spanning approximately 90 feet over the Assabet River, a nationally designated Wild & Scenic River.

Cost Comparison of Alternatives:

ALTERNATIVE 3: Prefabricated Bridge (Truss) Bridge No. 14.81 - Assabet River				
Work Description	**Unit**	**Quantity**	**Unit Price**	**Cost**
Prefabricated Bridge	LS	1	$180,000	$180,000
Railing	LF	60	$60	$3,600
Modify Abutment	CY	8	$1,500	$12,000
			Subtotal	$195,600
			Contingencies (20%)	$39,120
			Total	$234,720
			Budget	$235,000

ALTERNATIVE 4: Concrete Deck Bridge on Steel Stringers Bridge No. 14.81 - Assabet River				
Work Description	**Unit**	**Quantity**	**Unit Price**	**Cost**
Concrete Deck and Curb	CY	28	$1,200	$33,600
Railing	LF	180	$60	$10,800
Steel Stringers	LB	18,000	$3	$54,000
Modify Abutment	CY	8	$1,500	$12,000
			Subtotal	$110,400
			Contingencies (20%)	$22,080
			Total	$132,480
			Budget	$135,000

Recommendation:
It is recommended that a prefabricated bridge be installed over the Assabet River (Alternative 3) to replace the previously removed Bridge No. 14.81. Although a concrete deck bridge on steel stringers (Alternative 4) is less expensive, the benefits of using a prefabricated bridge at this location outweigh the additional cost.

The benefits are as follows: Most importantly, these bridges come completely fabricated for easy installation, thereby reducing the time required for installation. The reduced on-site construction requirements will help minimize the amount of temporary impacts in this sensitive environmental and riverfront resource area. Further, a truss-type bridge will provide an aesthetic addition to this nationally designated Wild & Scenic River.

A prefabricated bridge at this location may not need to be designed for an H10 truck load due to the trail's proximity to area roadways. The bridge can be accessed from either Main Street/Route 62 or Old Marlboro Road. Designing for a lower loading will reduce the cost of the structure. During the design phase, structural engineers will need to determine the proper loading requirements of the bridge.

11.2 Powder Mill Road Underpass

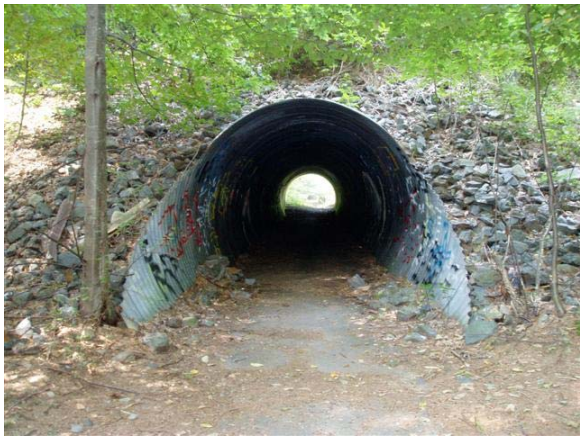


Figure 37: Existing Corrugated Metal Pipe Underpass

Description:
The corridor is carried beneath Powder Mill Road via a corrugated metal pipe (CMP). Powder Mill Road is a two lane residential roadway with a sidewalk along the northern side. There is a 2:1 slope leading from the roadway to the right-of-way corridor below.

The main CMP section is approximately 9 feet in diameter and 96.5 feet in length with the flared pipe ends extending an additional 10 feet on each approach. On the northern approach, the existing ground is built up such that there is only 6.5 feet of clearance from the existing ground to the top of the CMP. On the southern approach, there is 8 feet of clearance.

Figure 38: Looking North Along the Corridor

The CMP appears to be structurally adequate, but it posses several less than desirable characteristics for rail trail use including:

- Insufficient vertical and horizontal clearance
- Dark and intimidating to trail users
- CMP edges present a safety hazard

Recommendation:

Figure 39: Concrete Box Culvert Along the Nashua River Rail Trail

It is recommended that the CMP be replaced with a concrete box culvert as part of the rail trail project. The vertical distance from the top of the CMP to Powder Mill Road is greater than 10 feet. Given this fact, it seems feasible to replace the CMP with a 10-foot high by 20-foot wide concrete box culvert, similar to the one shown below. The 20 foot width was provided for both the rail trail and an adjacent soft surface / equestrian trail. The 10-foot height is standard for rail trail underpasses. The box culvert will widen and improve the viewshed for trail users. A graffiti resistant coating can be applied to the inside of the box culvert and abutments.

A concrete box culvert can be "jacked" under a two-lane roadway over approximately a 3-month timeframe if traffic can be detoured. It appears that two detour possibilities from / to Old Marlboro Road exist including:

- Sudbury Road to 'Old Road to Nine Acre Corner' to Williams Road
- Sudbury Road to North Road (Route 117) to Dakin Road to Old Pickard Road

The Town may prefer to complete the concrete box culvert construction in two phases, if it is deemed necessary to keep Powder Mill Road open. A two-phase construction process would extend the timeframe required to install the culvert. Traffic management plans will need to be developed for the construction of the underpass.

Other improvements could be made to the CMP to improve its suitability for rail trail use including:

- Flared wood rail fencing to shield the path-side hazards (exposed pipe ends)
- Signage to warn users of the horizontal and vertical clearance restrictions

Nashoba Brook - Bridge No. 13.86

Figure 40: Existing Condition

Figure 41: Alternative 1 - Reuse of Existing Bridge Structure

Nashoba Brook - Bridge No. 13.86

Figure 42: Alternative 2 - Prestressed Concrete Bridge

Figure 43: Alternative 3 - Prefabricated Bridge

Nashoba Brook - Bridge No. 14.81

Figure 44: Existing Condition

Figure 45: Alternative 1 - Reuse of Existing Bridge Structure

Assabet River - Bridge No. 15.16

Figure 46: Existing Condition

Figure 47: Alternative 3 - Prefabricated Bridge (Truss Type)

Assabet River - Bridge No. 15.16 (cont'd)

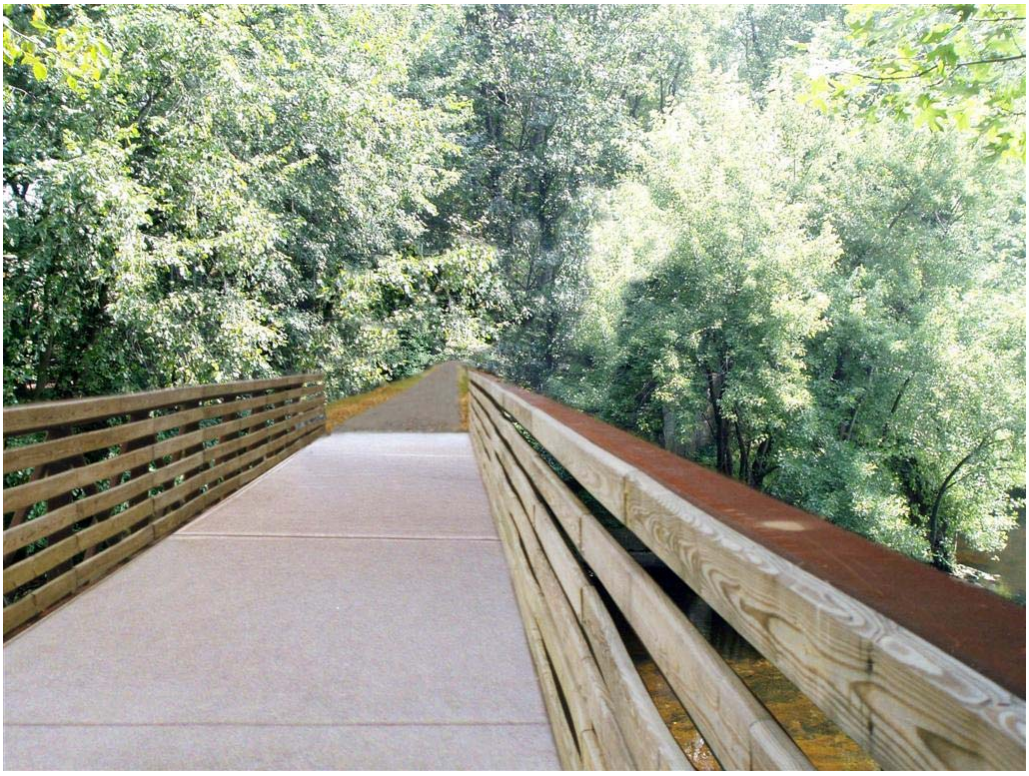


Figure 48: Alternative 4 - Concrete Deck Bridge on Steel Stringers

12 White Pond Alternatives

Abutters in the White Pond area have expressed concern to the Town about the impacts of the proposed rail trail upon the environs. In response to these concerns, the Town requested that this Assessment discuss the feasibility of alternative routes that would divert the rail trail away from the existing right-of-way through this section of corridor.

Four criteria were used to guide the feasibility assessment of each alternative. The criteria included safety, accessibility, attractiveness and available right-of-way. The alternatives were evaluated in terms of their consistency with the project objective of creating a safe and continuous multi-use facility that can be used and enjoyed by the public. Further, the recommended alternative should facilitate a future extension of the Bruce Freeman Rail Trail into Sudbury.

Two primary alternatives were considered between Powder Mill Road and the Sudbury Town Line. The alternatives included:

- Alternative 1: Powder Mill Road west to Old Pickard Road to Sudbury Town Line
- Alternative 2: Powder Mill Road east to Plainfield Road to South Road (Route 117)

Mapping of these two alternatives is included in Appendix B of this Environmental And Engineering Assessment.

In both Alternative 1 and 2, the trail would travel from the railroad corridor upward to join Powder Mill Road at-grade, as opposed to traveling southward through the existing corrugated metal pipe underpass. The connection would either be located within the railroad right-of-way (which is 99 feet wide in this area), through adjacent Town-owned conservation land, or a combination of both (See Sheet 8 of 9). The Town parcel on the west side of the railroad corridor has a small channel running through it, placing further limitations on the use of this parcel. Any development on the Town-owned conservation land will be subject to applicable development restrictions.

The difference in elevation from the rail bed to Powder Mill Road is estimated to be in the magnitude of 20 feet, based upon visual inspection. In order to maintain a maximum slope of 5% to meet ADA Accessibility Guidelines, the ramp to bring the trail up the slope would need to be approximately 400 feet long. This connection will result in substantial visual and vegetative impacts to the area.

Alternative 1 and 2 will lead Powder Mill Road to function as a trailhead. It can be anticipated that users will park on adjacent roadways in order to access the rail trail. No parking signs have already been placed along Powder Mill Road for this reason. Additional signage or police enforcement may be needed to further deter users from parking in this location.

To negate these two issues, it appears feasible to divert the rail trail through the Town-owned Sanborn Middle School property to connect to Old Marlboro Road north of its intersection with Powder Mill Road. A connection through the Sanborn Middle School property will eliminate the need to provide a significant ramp at the existing Powder Mill Road underpass. Based on visual inspection in this general area, the grade change behind the Middle School appears to be less severe as compared to Powder Mill Road. This facility option will bring users south along Old Marlboro Road to connect to Alternative 1 at Powder Mill Road. A facility along this stretch of Old Marlboro Road will result in similar opportunities and constraints to those identified for a facility along Old Pickard Road, as discussed below.

Alternative 1: Powder Mill Road west to Old Pickard Road to Sudbury Town Line

The facility would travel west along Powder Mill Road and then south along Old Pickard Road to the Sudbury Town Line.

The paved width of Powder Mill Road is 22 feet with a 35-foot roadway right-of-way. The posted speed is 30 mph. Two different facility types could be provided along Powder Mill Road. Both of these options will result in significant vegetative impacts along the roadway edge.

- *Bicycle Route* (shared roadway) by widening a total of 4 feet to accommodate 2-foot shoulders for improved shared use of the traveled way

- *Bicycle Lanes* by widening the roadway a total of 8 feet to accommodate 4-foot bike lanes in each direction.

The paved width of Old Pickard Road is 24 feet with a 45-foot roadway right-of-way. The posted speed limit along Old Pickard Road in Concord is 25 mph. Three different facility types could be provided along Old Pickard Road:

- *Bicycle Route* (shared roadway) through use of the existing 2-foot shoulders along the roadway with additional signage

- *Bicycle Lanes* by widening the roadway a total of 4 feet to accommodate bike lanes in each direction.

- *Multi-Use Trail* by widening the sidewalk along one side of Old Pickard Road to provide a separated 10-foot trail. Ideally, the grassed shoulder should be retained to physically separate the path from the roadway. The use of wood post and rail fences or, alternatively, timber guardrails could be explored to further separate the multi-use path from the vehicular travel lane.

Opportunities

- There is available roadway right-of-way along Powder Mill Road that could be used to widen the roadway to better accommodate a bicycle route or bicycle lanes.
- Existing sidewalk along the eastern side of the Old Pickard Road could potentially be widened to accommodate 10-foot multi-use path.
- Improved access to Peabody Middle School via the athletic fields abutting Old Marlboro Road / Old Pickard Road

Constraints

- On-road alternatives along Powder Mill Road will not attract the variety of users and skill levels that a separated multi-use facility typically attracts
- Improvements along Powder Mill Road will result in significant vegetative impacts along the roadway edge
- Relatively high volume of traffic (3000 vpd) along Old Pickard Road
- This alignment is not conducive to an extension into Sudbury along Dakin Road (the extension of Old Pickard Road in Sudbury); sight distance deficiencies due to vertical and horizontal curvature

Alternative 2: Powder Mill Road east to Plainfield Road to Route 117 (South Road)

The facility would travel east along Powder Mill Road and then south along Plainfield Road to Route 117 (South Road).

Similar to Alternative 1, the paved width of Powder Mill Road is 22 feet with a 35-foot roadway right-of-way. The posted speed is 20 mph. Two different facility types could be provided along Powder Mill Road. Both of these options will result in significant vegetative impacts along the roadway edge.

- *Bicycle Route* (shared roadway) by widening a total of 4 feet to accommodate 2-foot shoulders for improved shared use of the traveled way

- *Bicycle Lanes* by widening the roadway a total of 8 feet to accommodate 4-foot bike lanes in each direction.

Based on the relatively low volume of traffic and the presence of utility poles along the right hand side of the roadway, Plainfield Road would likely be classified as a *Bicycle Route* to permit shared use of the traveled way. There are some substantial grade changes and horizontal curves along Plainfield Road making it undesirable as a Bicycle Route.

Users would need to travel along Route 117 to rejoin the corridor in Sudbury. High volumes and speeds (40 mph) of vehicles matched with poor vertical and horizontal geometry for bicyclists make Route 117 unsafe for users of any skill level in its current condition. It is unlikely that any substantial improvements could be made to accommodate bicyclists along this stretch of roadway without significant impacts to adjacent land.

Opportunities

- There is available roadway right-of-way along Powder Mill Road that could be used to widen the roadway to better accommodate a bicycle route or bicycle lanes.
- Low volume of traffic along Plainfield Road

Constraints

- This route is a major diversion from the right-of-way, thus shifting the focus of path away from a viable alternative means of transportation
- On-road alternatives along Powder Mill Road will not attract the variety of users and skill levels that a separated multi-use facility typically attracts
- Existing pavements are generally in poor condition along Plainfield Road
- Narrow roadway without bicycle lanes along Plainfield Road will limit use by all skill levels.
- High volumes and speeds (40 mph) of vehicles matched with the vertical and horizontal geometry make Route 117 unsafe for users of any skill level in its current condition

Recommendation:

Of the two alternatives studied (to divert the rail trail away from the existing right-of-way), Alternative 1 is the more feasible option. However, it must be recognized that Alternative 1 still does not provide a safe multi-use facility for users of all ages and abilities.

The most practicable and feasible rail trail alignment is to locate the rail trail along the railroad right-of-way, and not pursue either of the two alternatives. The EOT concurs with this recommendation. This alignment is preferred for a number of reasons, including:

- Facilitates a future extension of the Bruce Freeman Rail Trail into Sudbury

- Provides a safer and more attractive experience for users of all ages and abilities

- Preserves the linear corridor to provide users with an uninterrupted traveling experience; Users relying on the path for transportation purposes will prefer a direct route between destinations.

- Reduces the potential for rail trail user and motorist conflicts

The rail trail alternative pursued along this section of the project will impact a future extension of the Bruce Freeman Rail Trail into Sudbury, a project that the Town is currently considering and will soon study in more detail. Therefore, as the Bruce Freeman Rail Trail project advances it will be important that the two towns coordinate their efforts.

13 Mitigation Measures

A key element in the development of the rail trail will be mitigating the impact of trail development on abutting resource areas and properties.

As part of the rail trail project, appropriate mitigation measures will serve to:

- Retain the privacy of abutting properties
- Discourage users from leaving the rail trail
- Prevent further trailside erosion

The objective of these measures is to control and block unwanted informal access to abutting resource areas and properties. These measures include both built and natural elements that can be located along the trail without sacrificing the overall visual quality of the corridor. The appropriate treatment should create a feeling of separation, but still preserve views into the corridor for surveillance.

Figure 49: Sensitive Wildlife Area Sign

Signage

Signage identifying where the adjacent land is private property or an ecologically sensitive area is a basic measure that can be used to deter trespassers. Signage used in combination with the other mitigation measures listed below will improve its effectiveness in controlling unwanted access. An example sign shown to the right reads “Sensitive Wildlife Area, Please Do Not Disturb, Police Take Notice.”

Fencing

Figure 50: Post and Rail Fence to Separate Rail Trail from Adjacent Private Land

Figure 51: Wood Rail Fence to Discourage Users from Leaving the Trail

The installation of wood rail or post and rail fencing along the corridor can serve a number of purposes without imposing the negative visual impact that a chain link fence in the same location would have upon the viewshed. Tall chain link fences are unattractive and compromise the safety of users.

The picture above shows a post and rail fence that was used to separate the private farmland from the trail. A similar fence, with signage indicating the land is state-owned, could be installed in the section of rail trail running alongside the Route 2 Reformatory fields to discourage users from trespassing.

A wood rail fence can serve to discourage users from traversing an adjacent side slope and/or walking down to the water's edge in search of a new vista. This treatment was used along the Nashua River Rail Trail in the vicinity of Groton Pond, as show in the picture above. A similar treatment would be effective where the corridor travels adjacent to White Pond. Additional signage would be needed in this area as a secondary measure to deter users from trespassing. Low growing, thorny native planting could be massed in natural forms along the wood fencing to further discourage trespassing.

Vegetation

Figure 52: Evergreen Trees for Screening

Obviously, where feasible, a natural vegetative buffer should be maintained to retain the privacy of abutting properties. In areas where there is limited vegetation, additional landscaping can serve to further retain the privacy of adjacent uses. Enhancing the vegetative buffer with additional trees can help address abutters concerns about people peering in their windows from along the corridor. Occasional evergreen trees may be used to screen truly objectionable elements such as the rear of commercial / industrial buildings in the West Concord Area as well as to further separate the access road to MCI-Concord from the rail trail, pending discussions with the Massachusetts Department of Corrections. Existing evergreen trees installed along the corridor in West Concord are shown to the left.

The need for and location of these measures will be determined on a case-by-case basis during the preliminary design phase of the project. Input from the Town and abutters will determine the appropriate mitigation measure to be used. These measures will be shown on the engineering design plans and included as part of the construction cost estimate.

14 Parking Facilities and Access Points

The primary access points for the Concord portion of the Bruce Freeman Rail Trail will be located where the rail trail crosses local roadways and abuts Town owned land.

14.1 Parking Facilities

Trailhead parking provides points of access for trail users. These access points will not only accommodate people from the immediate area, but those who have traveled further to use the trail. It is anticipated that many trail users will wish to drive to the rail trail to walk or bike. As much of the trail use will occur on weekends, the existing parking facilities along the corridor may be sufficient. These facilities include:

MBTA Commuter Rail Station: There are a total of 86 spaces at the MBTA commuter parking lot in West Concord center. This parking lot is along the alignment of the rail trail. The lot is jointly owned and operated by the Town of Concord and MBTA. There are a number of 3-hour parking spaces that do not have a fee associated with their use. There is no fee to park in this lot on the weekends. Local West Concord businesses would likely experience a greater volume of customers on the weekends if the parking area could be used for rail trail parking. This use will be subject to review and approval by the MBTA and Transit Realty Associates, LLC (TRA).

Old Rifle Range: This Town-owned conservation land is located along Old Marlboro Road near its intersection with Williams Road. This unpaved, unimproved lot is visible from the rail trail. The expansion of this lot to accommodate a few more vehicles warrants investigation. The Town owns a considerable amount of frontage at the entrance to the Rifle Range. A crosswalk supplemented with additional traffic control measures would be needed to safely bring users across Old Marlboro Road to the rail trail at Williams Road.

Sanborn Middle School: The Town's Conservation Land Guide (June 2000) states that the parking area at the rear of the school can be used to access the abutting Town-owned conservation land and trail system.

If additional parking is deemed necessary, the Town could make improvements to existing parking lots. These lots will need to be further explored during the preliminary design phase to assess existing ownership, lot size, feasibility, practicality and safety issues. The Town could also work with adjacent communities to jointly address parking needs.

For comparison purposes, the 11-mile Nashua River Rail Trail through the towns of Ayer, Groton, Pepperell and Dunstable has four designated parking areas. The formal trailhead lot has approximately 60 spaces and each of the other three lots have approximately 10 to 15 spaces.

14.2 Access Points

Figure 53: Sanborn Middle School Athletic Fields Adjacent to Corridor

The proposed rail trail will provide improved bicycle and pedestrian access to:

- Warner's Pond
- West Concord Center
- Old Rifle Range Conservation Area
- Sanborn Middle School

Proper directional signage matched with improved connections to local trail systems or along public roadways will improve resident and visitor access to these Town destination points. Providing alternative ways to access the rail trail will reduce the need for extensive parking areas and reduce vehicle traffic associated with the trail.

15 Trail Enhancements

There is an opportunity to transform the railroad corridor into a linear park that also serves in a transportation role for area residents. It will be important to improve and/or enhance the visual character of the corridor and provide amenities for rail trail users. Visual quality is an important part of the rail trail experience.

These trail enhancements can help create an identity for the rail trail. The use of clear, appropriate and consistent design elements will provide some of the strongest visual connections along the corridor. Visual connections can cue users to trail entries from adjacent roadways and sidewalks, and assist on-trail users in finding the continuation of the rail trail across intersections and to various points of interest on and off the trail.

With proper design and user amenities, the rail trail could enhance Concord's sense of community by serving a variety of functions - transportation alternative, close to home recreational facility, community meeting place, historical and cultural attraction, economic engine for local businesses and an accessible means of enjoying the natural landscape.

The design and location of any rail trail enhancements should be context sensitive to the project setting, while maintaining the safety and mobility of all users.

15.1 Trailside Amenities

Rail trail amenities will enhance the comfort and enjoyment of users. These amenities could include:

- Benches
- Picnic tables
- Trash receptacles
- Information kiosks
- Bike racks or lockers
- Restrooms

Primary considerations for recommending amenities and other trailside items should include:

- Appropriateness
- Functionality
- Attractiveness of design
- Desired materials (i.e. natural and/or sustainable materials)
- Durability
- Maintenance requirements
- Cost

These amenities should be strategically placed in areas along the corridor where the Town wants people to gather. In addition, information kiosks that help users find their way along the trail and to attractions along the trail would improve the trail's function as an economic engine for local businesses. Public restrooms should be considered primarily in West Concord Center, where users would tend to gather and/or begin/end their trip.

15.2 Scenic Vistas and Areas to Rest

There are a number of locations along the corridor that could potentially serve as scenic overlook areas or areas to rest. Scenic overlooks can enhance the trail users experience and draw attention to the natural setting. Controlled vista pruning at these locations can reveal scenic views without disturbing sensitive environmental areas or private property along the corridor.

Areas to rest can be as simple as a flat area adjacent to the trail or as developed as a special location with interpretative signage, picnic tables, bike racks and other amenities. These areas provide a location for rail trail users to pull over either to rest when the kids have to re-tie their

laces or adjust helmets, or just to stop for a breather for a minute in a pretty spot.

During the preliminary design phase, it will be important to solicit input from local Town Boards, Committees and the public to determine where a scenic vista and/or area to rest may be appropriate.

Some potential locations for such scenic vistas and/or areas to rest could include:

Warner's Pond: There may be an opportunity to create a Warner's Pond scenic overlook along the railroad corridor, just south of the reformatory fields. It will be necessary to vista prune and selectively thin and clear existing vegetation in order to frame a view at this location. It will be important to locate the overlook where it will not disturb the private residence in this area. Additional interpretive signage about the Pond and development of the surrounding area would further enhance this location.

Nashoba Brook: An overlook at the second crossing of Nashoba Brook (Bridge No. 14.81) would provide users with views of the brook that are not available in West Concord center. This bridge carries three railroad tracks across the brook and therefore has adequate width for both the rail trail and a seating area with benches, for example.

Other improvements in this general area could also be developed in collaboration with the Concord Park Assisted Living Facility. The Concord Park parcel is bordered by Nashoba Brook, Assabet River, railroad corridor and the MBTA Commuter Rail right-of-way (Sheet 3 of 9). Approximately half of the parcel is undeveloped. The facility maintains a stone dust walking path along the Assabet River for its residents with a scenic overlook where Nashoba Brook converges with the Assabet River (as shown to the right). There may be an opportunity for the Town to enter into an agreement with the Concord Park owners to jointly develop a connection between the scenic vistas and provide an additional amenity for facility residents and rail trail users.

Figure 54: Scenic Overlook at Concord Park

Concord Junction: The Old Colony Rail Road crossed the Boston & Maine Railroad to create a rail junction at Concord Junction. The rail trail will travel along the alignment of the Old Colony Railroad through a common gathering area in the heart of West Concord Center. This area currently has a brick surface with a few benches that could be used as a rest area for rail trail users. Additional interpretive waysides or bicycle racks could be added in this general area.

Assabet River: The section of the Assabet River where the rail trail crosses is dramatic and it can be anticipated that rail trail users will desire to stop at this location. A scenic overlook could be developed on the north (West Concord) side of the crossing with a minimal amount of clearing. Placing an overlook in advance of the bridge will reduce the number of users who choose to stop on the bridge itself. This overlook could also include benches and an interpretive exhibit.

White Pond: There is a scenic view of White Pond from the railroad corridor which will draw users attention. These views could be enhanced with minor, controlled vista pruning within the right-of-way, so as not to disturb sensitive environmental areas or private property. It is recommended that additional wood rail fencing be installed to discourage users from traversing an adjacent side slope and/or walking down to the water's edge in search of their own vista. This topic is further discussed in the Mitigation Measures Section of this report.

15.3 Interpretive Signage

Interpretive signage along the rail trail can give the trail a unique character and increase people's appreciation of the historical, cultural and natural resources in the area. The placement of these interpretational items will help guide where rail trail users stop and gather. There are many different opportunities to draw attention to the corridor's resources through ground and/or rail mounted colorful and informational signage.

The design of this interpretive signage should be:

- Mounted in locations and heights which are universally accessible
- Consistent in terms of design to establish a sense of continuity and identity
- Durable and require minimal maintenance
- Clearly legible and understandable

The actual design of the interpretive waysides and signs will occur during the preliminary design phase. Again, it will be important to solicit input from local Town Boards, Committees and the public to determine which features are chosen for interpretation along the trail.

Some potential locations for interpretation could include:

Warner's Pond: Warner's Pond and the surrounding area played an important role in the development of West Concord during the late 19th century. Interpretive signage at a scenic overlook of Warner's Pond could profile entrepreneur Ralph Warner and some of his ventures within the village of "Warnerville." Signs could also discuss the changing role of Warner's Pond over time - as a source of water power for a wooden tub and pail factory, to support ice businesses and as a recreational center in the late 19th century. The signs could also highlight the Town's current efforts to foster the long-term sustainability of the Pond.

Concord Junction: The history of Concord Junction has been preserved in the heart of West Concord center, near where the actual rails crossed. Portions of the two rails have been set and accentuated in the brick surface and supplemented with an engraved granite boulder. Additional surface design elements at this location could be used as a form of interpretation. Shown to the right is the Nashua Heritage Trail where FST used a brick trail surface with granite stone to represent the tracks of the abandoned Nashua-Worcester rail line originally developed in 1848. A similar brickwork design could be added at Concord Junction along the alignment of the former Framingham-Lowell tracks, creating a linear extension of the existing brickwork at Concord Junction. This design would enhance the Junction's interpretive and aesthetic character as well as provide a functional benefit by helping to guide rail trail users through the area.

Figure 55: Interpretive Brickwork

Concord Junction was one of three isolated villages that was joined together to form West Concord. Additional signage could be added in this location to discuss the development of West Concord and draw attention to some of the businesses which have operated here over the years, including, for example, the Wood Publishing Co., which distributed the *Women's Home Journal* (1898) and the Budd Shirtwaist Co. (1905).

Old Colony Rail Road: This corridor is steeped in railroad history and the rail trail can provide a glance at the importance of this mode of transportation. To preserve the railroad history and maintain the character of the former rail line, it will be important to retain the historical elements of the rail line including existing mile markers, whistle posts, track equipment and signals. These elements tell an interactive railroad history for rail trail users. For example, the track switch shown to the right could be left in place along with about 30 feet of track. Union Station at Concord Junction, listed on both the State and National Register of Historic Places, would also be an ideal location to interpret how railroads shaped Concord's history.

Figure 56: Track Switch at Spur Line

Assabet River: An overlook area at the Assabet River would be an ideal location for an interpretive exhibit about the Sudbury-Assabet-Concord (SuAsCo) River Basin. The exhibit could also discuss the "outstandingly remarkable values" (ecology, archeology and history, scenic, recreation and literary resources) that gained the Assabet River its designation under the National Wild and Scenic Rivers System.

Vernal Pool: Vernal pools along the corridor should not be viewed as environmental restrictions but as educational opportunities to teach users the value of these systems. There are two vernal pools located directly adjacent to the railroad corridor north of the Powder Mill Road underpass and one vernal pool south of the underpass. A sign similar to the one shown to the right could be installed along the rail trail to draw attention to the documented species and biological function of these unique habitats

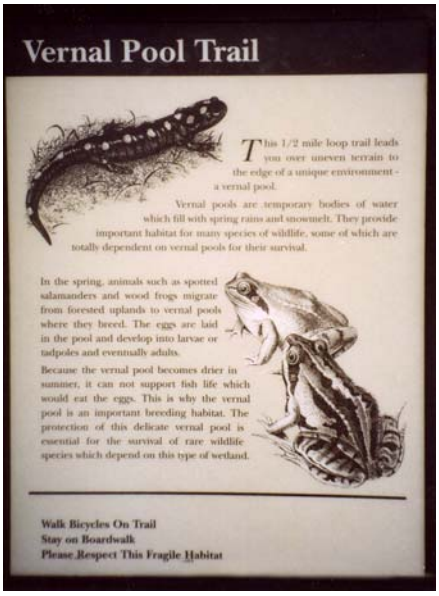


Figure 57: Vernal Pool Sign

White Pond: A scenic vista along the rail trail at White Pond would be an ideal location to profile author Henry David Thoreau, who was a frequent visitor to White Pond. Thoreau wrote, "…perhaps the most attractive, if not the most beautiful, of all our lakes, the gem of the woods, is White Pond…" Signage could include this excerpt along with some additional biographical information on one of Concord's most famous authors. Alternatively, signage could also discuss the ecology and sensitivity of this kettle pond.

15.4 Lighting Assessment

Lighting can be used to improve safety and aesthetics but must be done with maintenance and abutter issues in mind. This rail trail will be managed as a dawn to dusk facility and therefore should not be lighted in its entirety. Lighting should only be considered in West Concord Center to enhance the commercial center. If the Town decides to illuminate the rail trail in West Concord Center, the lighting should complement the existing lighting in the area. Lighting the trail in its entirety would encourage night usage, cause light pollution in residential areas and result in additional maintenance responsibilities and costs to be incurred by the Town.

15.5 Landscaping

Ornamental plantings and screening will serve to strengthen visual connections along the railroad corridor. Uniform treatments and proper vegetative management will improve the visibility and overall appearance of the trail. Some recommendations include:

- Introduce new plantings to reinforce the rail trail entry points, enhance and support desirable views at scenic vistas and/or areas to rest and introduce seasonal color, beauty and shade for trail users.

- Add tree plantings to frame and identify rail trail / roadway crossings without interfering with their operational effectiveness.

- Strategically locate new plantings to buffer unwanted views such as MCI-Concord and the rear of commercial/industrial buildings in West Concord. Screening is further discussed in the Mitigation Measures Section in this report.

- Minimize the extent of disturbance to existing vegetation between private properties and the rail bed. Install additional plantings, where needed, to retain the privacy of these owners.

- Clear extensive areas of woody and tall vegetation back from both sides of the trail at entry points, to increase visibility and sight lines and to cue both drivers and trail users of crossings and trail access points.

- Vista prune and selectively thin and clear existing vegetation in order to frame views at overlook locations.

The goal of landscape design should be two-fold, to add to and enhance existing vegetation and introduce new, self-sustaining native species where needed along the corridor.

16 Maintenance and Public Safety Oversight

Once a trail is in place, it must be operated and maintained to provide a quality recreation and/or transportation amenity for the years to come.

16.1 Maintenance Activities

The maintenance of a trail includes various activities involved in keeping the trail in a safe, usable condition. This maintenance ranges from mowing and trash removal to the replacement of damaged signs to the reconstruction of the trail. The level and type of required maintenance will also vary by the section of corridor, from the more commercially developed area of West Concord to the more rural setting south of the Assabet River. The Town will incur the costs of conducting such maintenance activities over the lifetime of the trail. Such activities include:

MAINTENANCE CHECKLIST	
Frequency	**Activity**
As-needed	▪ Tree and shrub trimming ▪ Shoulder and grass mowing ▪ Tree / brush clearing ▪ Trash removal / litter pickup ▪ Trail sweeping ▪ Sign replacement / repair ▪ Map / signage updates ▪ Amenities replacement / repair (benches, tables, etc.) ▪ Graffiti removal
Seasonal	▪ Planting / beautification ▪ Culvert clean-out ▪ Fallen tree removal ▪ Revegetation of adjacent areas (for erosion control)
Long-Term	▪ Pavement crack sealing / spot repair ▪ Pavement marking replacement ▪ Bridge / tunnel inspection ▪ Fencing repairs ▪ Trail resurfacing ▪ Trail replacement / reconstruction

Trail inspections are integral to all trail maintenance activities. Inspections should occur on a regular basis to systematically identify and control any conditions that may impact the safety of users or detract from the visual quality of the trail. Proper trail maintenance will protect the Town's investment in the rail trail.

It is difficult to identify the costs related to as-needed, seasonal and long-term maintenance activities. Many publicly owned and managed rail trails incur trail maintenance costs as part of their annual public works or parks & recreation programs and budgets. These entities typically do not keep a separate cost and activity record of the maintenance and management of the rail trail.

The Rails-to-Trails Conservancy (RTC) Northeast Regional Office just completed a study of various trail maintenance and operations issues for more than 100 open rail-trails in the northeast region of the United States. Their findings have been compiled in a publication entitled "*Rail-Trail Maintenance & Operation: Ensuring the Future of Your Trail - A Survey of 100 Rail-Trails*." This publication will soon be available on RTC's website [http://www.railtrails.org/]. The Town should consult this publication for valuable information on budgetary issues, staffing, equipment and various other needs related to the operation and maintenance of a rail trail.

One way to reduce the required levels of rail trail maintenance, and thus the cost to the Town, is to select design treatments and amenities with their future maintenance in mind. Primary consideration should be given to selecting a rail trail surface material, bridge design, site

furnishings, landscaping, etc. which are durable and require low maintenance without sacrificing their functionality and attractiveness. For example, using a low growing and hardy seed mix will reduce the need for frequent mowing and provide good slope stabilization. Similarly, selecting a trail surface material that is readily available, easy to repair and has a long lifetime will cut down on maintenance costs.

Beyond proactively incorporating these considerations into the design of the rail trail, it is also recommended that an operations and maintenance (O+M) manual be developed for the facility. This manual should be drafted during the design and construction phase of the project to allow the Town to better plan for the continued maintenance of the facility. The Town should use the manual to:

- Establish specific O+M goals and standards
- Develop a maintenance program for as-needed, seasonal and long-term maintenance activities
- Schedule and monitor maintenance activities
- Program future rail trail maintenance requirements
- Develop cost data from which a rail trail budget can be formed
- Identify Town, local and volunteer resources

16.2 Public Safety Oversight

The Concord Police Department has a Bike Patrol Unit for general and special patrol services. This Unit is another facet of the department's proactive approach to law enforcement and community policing. A Bike Patrol Unit makes the officers more approachable and accessible to the community while keeping them mobile enough to be effective patrol officers. The Bike Patrol Unit could incorporate the proposed rail trail into their regular patrol route provided the availability of resources (budget and staffing).

The Bike Patrol Unit officers attended a Mountain Bike Patrol School certified by the Massachusetts Criminal Justice Training Council known as COBWEB (Cops On Bikes With Education for Bicyclists). COBWEB is the original Massachusetts Police Mountain Bike Patrol Course designed to train the officer/s for his/her duties while on a Bike Patrol Unit. The COBWEB course is a 24-hour three day program with both classroom and field instruction. The officer, upon completion of the course, will have developed a heightened awareness of the importance of fitness, nutrition, injury prevention and physical well-being. The officer will also have a comprehensive understanding of standard operating procedures, crime prevention techniques, tactical maneuvers and communication.

The Police Department has also worked with the Public Works Department to implement a "Share the Road" program to enhance bicycling and pedestrian safety on Concord's roads. This program includes traffic management and user education. The Police Department is trying to encourage, educate and enforce good bicycling behavior and road etiquette for bicyclists and motorists. The Police Department is forming a new traffic unit that will address bike safety issues in the Town. The department will continue their bicycle safety classes at local schools and will be holding a Town-wide bike rodeo in early-summer.

An additional benefit of bike patrols is that the officers have a chance to communicate with the public on a one-to-one, friendly basis. In Amesbury, the Amesbury Riverwalk Trail has afforded police patrols on foot or bike with a great opportunity to interact with the public, according to the Amesbury Police Sergeant. On the Minuteman Rail Trail, the Lexington Police Captain stated that bike patrols provide a great opportunity to meet and greet the public.

16.3 Volunteers

There may also be opportunities to engage local volunteers in the maintenance and oversight of the trail. Individuals and groups such as the Friends of the Bruce Freeman Rail Trail, Boy and Girl Scouts, watershed councils, local businesses, schools and residents frequently volunteer their time and complete community service projects. It will be important for the Town to identify

and contact these groups and individuals to update them on the progress of the project and look for ways to involve them during the next phases of the project.

Volunteers in the community could also help patrol the trail on behalf of the Police Department. The duty of the Community Patrol Program would be to provide assistance to citizens on the trail and report any activity that needs immediate response. Volunteers prevent crime by being a visible representative of the local police department. Volunteers do not intervene in any type of apprehension or dispute between individuals. They are to report these acts to the Police Department via cell phones and provide a log report at the end of their patrol.

Volunteers can also help in the seasonal and on-going maintenance of the trail. The use of volunteer labor and/or resources will help reduce the costs of maintenance to the Town while providing members of the community with a sense of ownership in the trail. The Friends of the Bruce Freeman Rail Trail have indicated that they would be interested in helping with the seasonal maintenance of the rail trail.

17 Construction Cost Estimate

A budgetary estimate of anticipated construction costs was developed for the 3.5-mile Concord segment of rail trail.

The preliminary cost estimate was based on:

- Bids received from contractors on other MassHighway advertised rail trail projects across the state (as published in the CIM Construction Journal)
- Current MassHighway Weighted Average Bid Prices
- Similar work recently designed by the consultant

The estimate assumes one 10-foot wide paved rail trail, with a 2-foot shoulder along one side and a 5-foot shoulder along the other side. The 5-foot shoulder will support additional uses including a soft walking surface and equestrian use. Further, it assumes that the recommended rail trail bridge and culvert improvements are implemented, as discussed in the Structures Section of this report.

BUDGETARY CONSTRUCTION COST ESTIMATE					
Item	**Work Description**	**Unit**	**Quantity**	**Unit Price**	**Cost**
1	Clearing and Grubbing	A	4	$15,000	$60,000
2	Track Removal **	LF	35,000	$20	$700,000 **
3	Disposal of Treated Wood Products	TON	1,050	$400	$420,000
4	Excavation	CY	12,000	$10	$120,000
5	Bituminous Concrete Pavement	TON	5,000	$65	$325,000
6	Gravel Borrow	CY	10,000	$20	$200,000
7	Bridge No. 13.86 (Nashoba Brook)	LS	1	$40,000	$40,000
8	Bridge No. 14.81 (Nashoba Brook)	LS	1	$125,000	$125,000
9	Bridge No. 15.16 (Assabet River)	LS	1	$240,000	$240,000
10	Concrete Box Culvert (Underpass)	LS	1	$300,000	$300,000
11	Imprint© Paving (Roadways + Concord Junction)	SF	5,000	$25	$125,000
12	Loam Borrow	CY	2,200	$25	$55,000
13	Wood Rail Fence	LF	8,500	$25	$212,500
14	Drainage	LS	1	$15,000	$15,000
15	Landscaping & Amenities	LS	1	$100,000	$100,000
16	Wetlands Protection	LS	1	$20,000	$20,000
	Subtotal				$3,057,500
	Contingencies (15%)				$458,625
	Inflation Adjustment (5 years)				$560,000
				Total	$4,076,125
				Say	$4.1M

** Given the current prices of steel, it is possible that the EOT may remove the rails for salvage value before signing a property agreement with the Town. This issue would be more fully developed in the context of the proposed disposition of the property for alternative transportation use.

The construction cost estimate for a typical rail trail cross section assumes removal of the tracks and ties along the corridor. The preliminary estimate includes the cost associated with the removal of the existing rails on a linear foot basis and the disposal of treated wood products on a per ton basis. Removal of existing rails is a labor intensive item that includes cutting the track into manageable sections for hauling purposes and removing tie plates, spikes, pins, rail anchors, and all other rail hardware. As noted above, the EOT may remove the rails for salvage value before signing a property agreement with the Town. This issue would be more fully developed in the context of the proposed disposition of the property for alternative transportation use. Disposal of the treated timber cross ties includes the cost of removing and stockpiling the ties and transporting the ties to an approved waste facility in accordance with all local, state, and federal regulations. The estimate places the total cost of these two items of work at approximately $1.1M for the 3.5-mile corridor.

A contingency cost has been included to account for specific items of work that will be determined during the preliminary design phase Also, the estimated cost has been escalated using a flat inflation rate (3%) and compounded annually to estimate for expected increases in the cost of construction before the rail trail is actually built (a five year timeframe was assumed). Taking these factors into account will provide the Town with a more realistic estimate that can be used to evaluate the municipality's financial ability to provide matching funds for the project.

This preliminary cost estimate provides the Town with a magnitude of cost for certain items of work related to the construction of the 3.5-mile rail trail. A more accurate estimate would need to be developed during the preliminary design stages of the project in order to program the necessary funding.

18 Public Participation Program

Public involvement is one of the key ingredients in advancing a rail trail from the study phase to design and construction. The degree of involvement solicited conveys to the public how important their participation is in the process.

A Public Involvement Plan will need to be developed to outline the overall philosophy, goals and techniques that will be used throughout the various phases of the project to get people and groups involved and obtain useful feedback.

The elements of a Public Involvement Plan include:

- Lists of potential participants
- Description of information sharing techniques, such as email, website, newsletters and fact sheets
- Description of techniques to educate the community
- A menu of different ways to reach different constituencies, such as presentations at meetings, email alerts, news articles, etc.
- Proposed agenda of Committee meetings

When drafting the plan it will be important to:

- Identify and learn from the experiences of related activities previously undertaken by Town committees/boards and local constituencies
- Define who are the stakeholders and who are the interested parties
- Ensure balanced and inclusive representative among Town entities, resident groups and rail trail advocates
- Understand that as the degree of public involvement increases, so does the commitment of resources required on the part of the Town

A Town appointed Rail Trail Advisory Committee should be formed to spearhead any rail trail related efforts going forward and implement the Public Involvement Plan. The Committee should be comprised of a key group of stakeholders with varied and balanced representation, and include a Board of Selectman representative or liaison. In order to help members fully participate and keep Committee moving forward, it will be critical to establish the goals, objectives, structure, processes, etc. of the Committee during the first few meetings.

In addition to this Committee, there will be many others who will be interested in the project and its progress who will be less actively involved, but none-the-less want to be kept up-to-date and have opportunities to give input and feedback. These people also need to be provided with easy and continuous access to information on the progress of the project. In order for a Public Information Plan to be successful, all interested people must be provided with access to clear, timely and accurate information.

19 Project Schedule

This Environmental and Engineering Assessment report objectively outlined the corridor's potential as a shared-use rail trail and assessed the key issues involved with the rail to trail conversion process. After reviewing this report, the Town and stakeholders should have a better handle on the feasibility of advancing the rail trail project from the study phase to design and construction.

Additional follow-up research to this report will be required to advance the project to the design phase. Even more importantly, the Town needs to assess its preparedness for implementation in terms of project funding and local support.

On the following page is a listing of next steps the Town needs to complete (or coordinate) in order to move forward with the project. This framework will assist the Town in tackling the critical next steps in the process. Some tasks will need to be completed during certain phases of the project whereas others can be ongoing activities. Some tasks will produce tangible results whereas others involve continued coordination and representation to remain abreast of current developments that may impact the rail trail.

The Town will need to establish a realistic timeframe over which to advance the project and assign responsibilities and resources to carry out the necessary tasks. Tasks should be undertaken based on their potential to impede the project in the future and then further prioritized based on available Town funds and the required staff resources to support each activity.

NEXT STEPS IN RAIL TRAIL PROJECT		
Phase	**Activity / Task**	**Responsible Party ****
Post-Study	Conduct a full title review of the corridor	Town, EOT
	Form a Town Rail Trail Advisory Committee	Town
	Assign a Town staff member as Project Manager	Town
	Discuss possible terms of property agreement with the EOT	Town
	Interface with the Massachusetts Department of Corrections (DOC)	Town, EOT
	Continue working with the MBTA regarding the rail trail / West Concord Station crossing	Town
	Evaluate municipal financial outlook to provide matching funds for federal and non-federal funding programs	Town
	Broaden awareness of the project and begin to gain consensus	Town, Volunteer
	Identify sources of local, state, federal or private funding	Town, Volunteer
	Perform detailed on-site survey of historical railroad items	Town, MHC
	Perform additional trail clearing activities	Town, Volunteer
	Attend quarterly Route 2 Corridor Advisory Committee meetings at MassHighway to ensure rail trail crossing of Route 2 is incorporated into the Rotary Redesign Project	Town, Volunteer
	Coordinate with municipal officials in adjacent communities to jointly approach rail trail related topics	Town
	Work with state and regional planning entities to ensure that the project is given full consideration in the Boston Metropolitan Planning Organization (MPO) programming process	Town
	Remain actively involved and up-to-date on cross departmental issues that may affect the project	Town
Pre-Design	Enter into property agreement with the EOT for use of the corridor (rail trail design, construction and maintenance)	Town
	Secure municipal financial resources	Town
	Apply for rail trail funding	Town
	Initiate conversations with state agencies with jurisdiction over the project (MHC, NHESP) to prevent unnecessary delays in the future	Town
	Hire engineering consultant to prepare design plans and documents	Town
	Develop Public Involvement Plan	Consultant, Town
	Conduct rail trail visioning workshops	Consultant, Town
Design	Conduct field reconnaissance survey	Consultant
	Prepare rail trail design plans and documents	Consultant
	Implement Public Involvement Plan	Consultant, Town
Construction	Prepare O+M Manual	Consultant, Town
Ongoing	Work with White Pond Advisory Committee to address their concerns	Town
	Continue outreach, education and fundraising efforts	Town, Volunteer
	Work with the Friends of the Bruce Freeman Rail Trail	Town

** The 'Town' as responsible party means a Town staff member, committee or board, as determined by the Selectman.

Appendix A – Project Mapping

Appendix B – White Pond Alternatives Mapping

Appendix C – List of Acronyms

The following is a list of acronyms used throughout the text:

A	Acre
AASHTO	American Association of State Highway and Transportation Officials
ACOE	Army Core of Engineers
ACM	Asbestos Containing Material
ADA	American with Disabilities Act
ADAAG	American with Disabilities Act Accessibility Guidelines
BFE	Base Flood Elevation
BLSF	Bordering Land Subject to Flooding
BMPs	Best Management Practices
BWSC	Massachusetts Department of Environmental Protection Bureau of Waste Site Cleanup
CE	Categorical Exclusion Checklist
CERCLA	Comprehensive Environmental Compensation Liability Act
CERCLIS	Comprehensive Environmental Response, Compensation, and Liability Information System
CMP	Corrugated Metal Pipe
CMR	Code of Massachusetts Regulations
COBWEB	Cops On Bikes With Education for Bicyclists
Conrail	Consolidated Rail Corporation
CTPS	Central Transportation Planning Staff
CY	Cubic Yard
DCR	Commonwealth of Massachusetts Department of Conservation and Recreation
DEP	Department of Environmental Protection
DEPNFA	DEP - No Further Action required
DOC	Massachusetts Department of Corrections
DPS	Downgradient Property Status
EIR	Environmental Impact Report
ENF	Environmental Notification Form
EOEA	Massachusetts Executive Office of Environmental Affairs
EOT	Commonwealth of Massachusetts Executive Office of Transportation
EPA	Environmental Protection Agency
F&L	Framingham and Lowell
FBFRT	Friends of the Bruce Freeman Rail Trail
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration

FST	Fay, Spofford & Thorndike (Consultants)
GIS	Geographic Information Systems
LB	Pound
LF	Linear Foot
LS	Lump Sum
LSP	Licensed Site Professional
LSPNFA	Licensed Site Professional No Further Acton
MA	Massachusetts
MA DEP	Massachusetts Department of Environmental Protection
MAPC	Metropolitan Area Planning Council
MBTA	Massachusetts Bay Transportation Authority
MCI	Massachusetts Correctional Institute
MCP	Massachusetts Contingency Plan
MEPA	Massachusetts Environmental Policy Act
MGL	Massachusetts General Laws
MHC	Massachusetts Historical Commission
MPH	Miles Per Hour
MPO	Metropolitan Planning Organization
MS4s	Municipal Separate Storm Sewer Systems
MUTCD	Manual on Uniform Traffic Control Devices
NA&B	Nashua, Acton & Boston Railroad
NEPA	National Environmental Policy Act
NHESP	Natural Heritage & Endangered Species Program
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NPS	National Park Service
O+M	Operations and Maintenance
OGFC	Open Graded Friction Course
OHM	Oil or hazardous material
ORNAC	Old Road to Nine Acre Corner
PH	Priority Habitat for Rare Species
PRC	MassHighway Department's Project Review Committee
R&D	Research and Development
RAO	Response Action Outcome Statement

REMOPS	Remedy Operation Status
RTC	Rails-to-Trails Conservancy
SAFETEA	Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003
SF	Square Foot
SuAsCo	Sudbury-Assabet-Concord Watershed
SWPPP	Stormwater Pollution Prevention Plan
TRA	Transit Realty Associates, LLC
USGS	United States Geological Survey
UST	Underground Storage Tank
VPD	Vehicles Per Day
WH	Estimated Habitats for Rare Wildlife
WPA	Wetlands Protection Act