

MANCHESTER AND LAWRENCE BRANCH SHARED-USE PATH FEASIBILITY STUDY



PREPARED FOR THE:
CITIES OF LAWRENCE AND METHUEN

BY THE

MERRIMACK VALLEY PLANNING COMMISSION
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Preparation

This document was prepared by the Merrimack Valley Planning Commission (MVPC) in cooperation with the Federal Highway Administration and the Massachusetts Department of Transportation (MassDOT). Funding for this Project was provided under Contract #301200 with the Massachusetts Department of Transportation.

Disclaimer

This document has been prepared in the interest of information exchange. The MVPC assumes no liability for its contents or use thereof.

I. Executive Summary

The Cities of Lawrence and Methuen, Massachusetts share an interest in encouraging bicycling and walking as means of transport. These cities also view transportation as an essential component of their community and economic development programs.

The Manchester and Lawrence (M&L) Branch is a railroad right-of-way between Lawrence, MA and Manchester, NH. The Boston and Maine Railroad (B&MRR) formerly, and PanAm Railways (corporate successor to the B&MRR) currently, owns the M&L Branch. The B&MRR provided passenger and freight service to various communities along the Branch in Massachusetts and New Hampshire for many years. With respect to Massachusetts M&L services, these were furnished directly to the host cities of Lawrence and Methuen. The B&MRR also operated stations and freight yards in Lawrence, and a passenger station / freight house in Methuen along this right-of-way. Passenger service on the M&L was discontinued in the 1950's; freight movements remained active until the 1990s. Today, PanAm Railways delivers a modest amount of freight to one or more businesses only as far north as Manchester Street in Lawrence. Track and other structures, and the Methuen B&MRR station remain in the Massachusetts segment of the M&L Branch.

The Project (as proposed) would utilize the M&L Branch right-of-way which begins at the junction of the former B&MRR Western Division and the M&L Branch on the southern bank of the Merrimack River. The M&L Branch crosses the Merrimack River by a dedicated bridge, and swings northwest across Broadway (Route 28) at-grade. The M&L then runs roughly parallel to Broadway in a northerly direction at-grade, and in alternate elevated or cut segments. The M&L traverses at-grade crossings, bridges and underneath street overpasses at several locations toward the Massachusetts / New Hampshire boundary.

There has been some interest among certain stakeholders in both communities to convert the M&L Branch to a shared-use path, consistent with similar paths constructed in several of the M&L communities in New Hampshire. If constructed, the Project would connect with other similar facilities now in development such as the Merrimack River Trail, the Lawrence Riverwalk, the Shawsheen River Trail, and the Spicket River Greenway. The project has the potential to provide exceptional connectivity to a network of regional trails in development such as the Border to Boston Trail (intersection in Georgetown) via the Merrimack River trail, the Bradford Rail Trail, and the Georgetown Branch shared-use path.

The project vision is the creation of a multi-modal transportation facility that leverages significant community development and transportation investments. The project will be designed to appeal to a wide variety of users, similar to those trails to which it would connect. Further, the project's ability to use a right-of-way with segments that are municipally owned or subject to long-term easements is positive. Finally, the right-of-way connections to public transportation are potentially exceptional.

A few project challenges exist but are not insurmountable. Reuse, replacement or omission of the Merrimack River Bridge from the Project may be a significant factor in determining whether the path terminates on the north bank of the Merrimack River adjacent to the Broadway Bridge. A consideration might be that the path should integrate with the abutting street network at this location. This would also afford the opportunity to abandon the at-grade crossing of Broadway, remove the crossing infrastructure, and tie the path to an existing intersection just north that is perhaps easier and safer to modify. The right-of-way width in Lawrence may permit its retention for future use as a shared transit / path facility – particularly if certain routes could bypass traffic along Broadway during peak congestion periods.

There appear to be some utilities in the right-of-way, i.e. overhead wires. It is unclear what, if any subsurface utilities exist. In general, the utilities are presumed modest and do not appear to preclude other uses of the right-of-way (i.e. transportation, recreation, etc.). The MVPC expects that it will be necessary to secure rights in a few locations where detailed analysis will likely show that there will be right-of-way encroachments and prior land sales. Finally, the design challenge will be to determine whether there are project segments that should be aligned with or use portions of road rights-of-ways to maximize safety and ensure greatest connectivity with residential neighborhoods. It is assumed that the path will be designed to accommodate emergency and maintenance vehicles.

The Cities of Lawrence and Methuen must provide strong guidance on what their plans are for the neighborhoods adjacent to the future path. In particular, Lawrence must advise of former plans for the neighborhoods west of Broadway that inform Project potential to avoid conflicts and ensure that the path supports the City's goals. The work already conducted by Lawrence-based organizations such as Groundwork Lawrence must inform the development of this Project as well.

Particular to this Study, Groundwork Lawrence (GWL) and Lawrence Community Works (LCW) have partnered to develop the shared-use path. The GWL obtained a grant from the Massachusetts Smart Growth Alliance (MSGa) to develop the M&L shared use path project as one of several similar projects throughout Lawrence. The Methuen portion of the M&L shared-use path is being advocated for by local residents. The City of Methuen has executed a 99-year lease with the Massachusetts Bay Transportation Authority, current owner of the M&L Branch, to develop the Project; a similar action will be required for the Lawrence segment of the Project. A potential difference in the amount of rights required for the Lawrence Project segment, particularly to address the potential need to maintain rail service between South Lawrence and Haverhill Street. This must be discussed with the MBTA and PanAm Railways. The MVPC assumes that if rail service is to be maintained, the trail would not be designed to utilize the existing railroad bridge over the Merrimack River to reach South Lawrence at this time.

II. Introduction

The Merrimack Valley Planning Commission (MVPC), as staff to the Merrimack Valley Metropolitan Planning Organization (MVMPO) is undertaking this Project to determine the feasibility of establishing a non-motorized, shared-use transportation facility utilizing portions of the former Boston and Maine Railroad “Manchester and Lawrence Branch” railroad right-of-way. The Project is a priority for Lawrence and Methuen-based organizations and will also facilitate travel between several Concentrated Development Centers (CDCs) identified by the MVPC in its 2009 Priority Growth Strategy. The Project is also recommended by the MVMPO in its 2011 Regional Transportation Plan.

III. History of the Manchester & Lawrence Branch

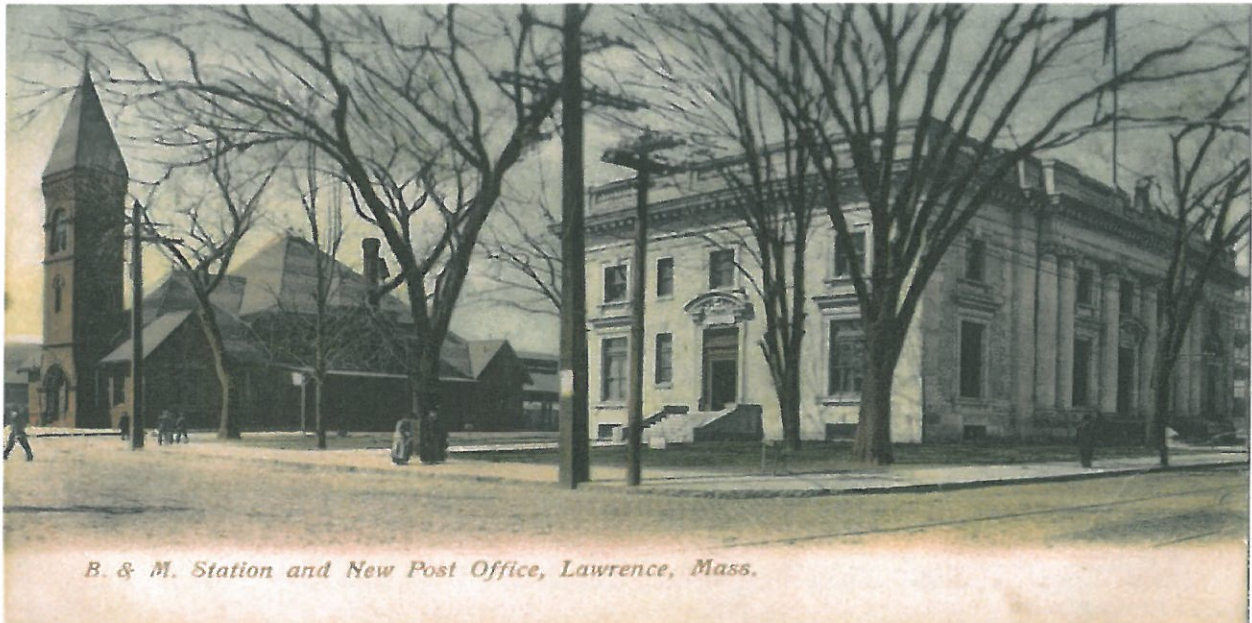
Prior to the development of railroads in New England, boats were the most efficient means of transport in the Merrimack River Valley communities. By the 1840s, steamboat travel on the Merrimack River between Haverhill and Newburyport served many residents and businesses’ needs. West of Haverhill, the river’s navigability, naturally limited by its shallow depth and by underwater obstructions, was severely restrained by the construction of the Great Stone Dam in 1845-1848 ([National Register of Historic Places](#) in 1977. http://en.wikipedia.org/wiki/Great_Stone_Dam

Land travel remained difficult. Railroad services into the western portion of Essex County through Andover, Lawrence, Methuen and North Andover were promoted by business interests in these communities with particular gravitas in the City of Lawrence, one of the largest planned industrial communities in New England.

There were several interests in bringing railroad service to the Merrimack Valley region. Perhaps the most significant interests were those of early industrialists then developing what would become major industries at various sites along the Merrimack River, particularly at Manchester, NH; Lowell, Lawrence and Haverhill, in MA. These cities became the region’s major centers of employment.

The M&L Branch was developed by two separate entities. The Manchester and Lawrence Railroad (M&LRR) was chartered in 1847 in New Hampshire by Manchester businessmen. Its portion of what would become the M&L Branch ran from Manchester south to the NH/MA boundary in Salem, NH. At about the same time, the Boston & Maine Railroad (B&MRR) developed its Methuen Branch which ran from South Lawrence to meet the Manchester and Lawrence Railroad at the MA/NH boundary in Methuen. Through operations began under the M&LRR with its lease of the B&MRR Methuen Branch. In 1848 the B&MRR relocated its depot between Andover and North Andover to a site along Broadway in South Lawrence, The B&MRR subsequently tried to gain control of the M&LRR; however a series of transactions among other railroads initially prevented this. Meanwhile, the B&MRR opened a second Manchester to Boston route which competed for some of the same customer base as the M&LRR.

City of Lawrence



NW corner of Essex and Broadway (1 block south of "Theater Row"). Demolished.

In 1879 the B&MRR built a substantial Romanesque-style passenger terminal (building at left, above) on the M&L Branch at the corner of Lawrence and Essex Streets. At various times it was called "Lawrence" or "North Lawrence" or "Lawrence - Essex Street". This station was closed in 1931; passenger service to Lawrence was provided via other B&MRR rights-of-way and stations located at 331 Essex Street (at the Opera House, later closed) and at an 'art deco' styled station opened in April 1931 at the junction of the Western Route Main Line of the Portland Division with the Manchester and Lawrence Branch (below).



B&MRR Lawrence Station, early 1930's – Merrimack and Parker Streets, S. Lawrence

(Insert current picture of station)

Passenger railroad services to/from Lawrence were later relocated with the B&MRR's closure and sale of the 1931 station. That station is now a commercial building that no longer serves trains (text courtesy William McCaffrey); source: Lawrence Public Library, <http://queencityma.wordpress.com/2011/01/11/railroads-lawrence-ma/>

City of Methuen

The M&LRR constructed the first "Methuen" passenger station and a freight house about 1850 on a site west of Broadway (Route 28), just south of the city's emergent central business district. This site was ideally suited to serve the growing community as it was proximate to the intersections of many of Methuen's major streets, linking the station with residential, commercial and industrial neighborhoods.

(Insert Sanborn atlas – no elevations of original station have been found, see below)

The railroad can be seen on the 1853 Essex County map, with a small depot and freight house on the west side of the tracks. The same building can be found on the 1872 atlas map. The absence of these two buildings on the 1884 map seems to be an error since they appear again on the 1896 atlas map. Various outbuildings were constructed in the immediate area, one or more by the nearby Methuen Company, to transfer freight to/from the railroad.

The original Methuen station was removed in 1907-1908. A second "Methuen" station was constructed in 1908. It was donated by local resident Edward F. Searles. http://www.methuenhistory.org/Sites/S_thu_W_Streets.html

The 1908 “Methuen” station and the 1850 freight house remain on site at 55 Union Street. The freight house is likely the oldest remaining building associated with the railroad in central Methuen. Passenger service to this station ended in June 1953. The station is privately owned today and is occupied by several businesses including a moving company. The freight house (visible in the second picture) is unused.



East façade, 2008.

Source: [http://upload.wikimedia.org/wikipedia/commons/5/53/Methuen Train Depot.jpg](http://upload.wikimedia.org/wikipedia/commons/5/53/Methuen_Train_Depot.jpg)



West façade. Source: www.olddrr.com

M&L Branch - Post World War II Operations

The B&MRR's corporate parent, the B&M Corporation, weathered many years of instability resulting in service cutbacks. Passenger service on the M&L Branch was eventually reduced to just one round trip per day, and eliminated in 1953. Special summer trains ran to Rockingham Park in Salem for the horse races until 1960. The M&L Branch continued to serve local freight through the 1960s and 1970s. Despite rapid growth in Rockingham County in the 1970s, rail traffic continued to decline. In 1983, after its acquisition by Guilford Transportation Industries (now PanAm Railways), the Springfield Terminal Railway or "ST" (a subsidiary) took over freight service on the M&L Branch. Ownership of the underlying M&L right-of-way in Massachusetts was transferred to the Massachusetts Bay Transportation Authority (MBTA). In 1984, Guilford abandoned the line between Salem and Londonderry, and three years later the line in Londonderry to Manchester Airport was abandoned, leaving the line split in two. Service from Manchester to the airport continued until the mid 1980s when the Manchester segment was taken out of service and freight service between Manchester and the airport ended. Freight ran from Lawrence through Methuen up to the Salem depot until December 1993. Service from Lawrence to the Rockingham Racetrack run-around sidings continued until March 1999, and all service past the Lawrence/Methuen line ended in June 2001. Since then, PanAm Railways has retained operating rights to provide freight service only as far north as Haverhill Street.

http://en.wikipedia.org/wiki/Manchester_and_Lawrence_Railroad

Community Context

MVPC identified and reviewed several data sources to develop a historic perspective of the land uses along the M&L Branch right-of-way. Sources included 1884 and 1892 atlases of Essex County, and Sanborn insurance maps that clearly detail railroad facilities, abutting land uses and businesses that received service from the railroad. Additional information has been provided by members of the Boston and Maine Railroad Historical Society (B&MRRHS).

During the years in which the railroad operated, the majority of the right-of-way traversed dense industrial, commercial and residential neighborhoods. Significant clusters of textile manufacturers proliferated along the M&L in Lawrence, particularly at the Arlington Mills on Broadway. Other businesses served by the M&L included lumberyards, coal dealers, steel distributors, and paper manufacturers. Of particular historical importance to the M&L Branch corridor is its close proximity to the City of Lawrence's "Theatre Row" district, which has been well documented. Over twenty theatres, including five on Broadway and seven on Essex Street, combined with many stores, professional offices and apartments (Lawrence Public Library)



Broadway looking north at Essex Street in 1956. Post Office is at the left. Further west is the M&L Branch and site of the former North Lawrence railroad station. "Theatre Row" is in the background. <http://www.pbbase.com/jroy/image/122518334>, collection of the Lawrence Public Library.



Theatre Row (Broadway), 1950s (source: Lawrence Public Library)



Broadway at Essex St, Northwest Corner today. Post office and B&MRR station removed; M&L Branch crosses Essex Street (in background).
<http://www.pbase.com/jroy/image/122233706>

The M&L Branch in Methuen – Elements of a Historic District

The Searles Tenney Nevins Historic District was established by the City of Methuen in 1992 to preserve the distinctive architecture and rich character of one of Massachusetts' most unique neighborhoods. In the industrial boom of the late 19th century, Methuen city fathers Edward F. Searles, Charles H. Tenney, and David C. Nevins amassed considerable personal fortunes through hat manufacturing, textile production, and railroads. Their investments in Methuen heavily influenced the city's economic development and left a legacy of architecture and civic works that can be seen in mills, housing, schools, mansions, churches, monuments, playgrounds, the library, and the architectural fantasies that resulted from their artistic rivalry. The historic district boundaries were established to include properties and buildings constructed or used by the Searles, Tenney and Nevins families and the people who worked for them.

<http://www.cityofmethuen.net/index.php/city-departments-mainmenu-112/historic-district-mainmenu-84.html>

Particular to this Study are the former M&LRR Freight House and the 1907 B&M Station at 55 Union Street (both extant, discussed above) and a former Methuen Company storehouse at 62 Rear Osgood Street (c. 1879, demolished 1998). These structures were incorporated into the Historic District.

http://www.methuenhistory.org/Sites/Lost_Methuen.html

IV Current Conditions

The MVPC utilized a variety of data sources from the Cities of Lawrence and Methuen; Boston and Maine Railroad valuation maps obtained from the Boston and Maine Railroad Historical Society, and atlases from various years, photographs, and other documents from Internet sites. The MVPC advises that at such time as the project advances beyond this phase, GPS-based field equipment can be used to locate and record the coordinates of various features along the right-of-way, and this information can be retrieved / or stored and analyzed using GIS technology. The MVPC believes that this approach is the most accurate way to prepare the Project for future design and construction, given that railroad mileposts were tied to specific routes and stations, were subject to change over time, and do not necessarily reflect actual right-of-way conditions in the field today.

Right-of-Way

The Project right-of-way is currently owned by the Massachusetts Bay Transportation Authority (MBTA), excepting rights in the vicinity of and across the Merrimack River that are believed to be the property of ENEL, formerly the Essex Company. The railroad bridge across the Merrimack River is presumed to be owned by the MBTA. The only MA segment that has been active in the past 1-5 years lies between Haverhill Street and the junction with the Western Division in South Lawrence.

Segments of the M&L Branch have been formally abandoned through the U.S. Surface Transportation Board. MP 1.4 – 4.4 (Lawrence-Salem) notice was served on July 5, 2001. Reportedly, the MBTA owns only MP 1.4-3.75

[http://www.stb.dot.gov/decisions/readingroom.nsf/UNID/F8A6EEE9AD005CB385256A780058A8C7/\\$file/31958.pdf](http://www.stb.dot.gov/decisions/readingroom.nsf/UNID/F8A6EEE9AD005CB385256A780058A8C7/$file/31958.pdf)

– this needs checking.

There are overhead power lines routed along the western edge of the right-of-way; these lines are presumed in service and assumed to be the property of National Grid (requires verification). These lines now or formerly conveyed electricity to the Arlington Mills complex and run along the entire Massachusetts segment of the M&L. The MVPC observed the presence of fiber optic cable in the right-of-way, running parallel to existing track structures at the western right-of-way edge. No power substations or pumping stations were observed. Pictometry data reveals that there are railroad tracks, ties, switches and other railroad infrastructure present throughout the Project, including at-grade crossings at Broadway, Essex Street, Haverhill Street (Lawrence); Union Street (Methuen) and north of Route 213 in Methuen. The railroad infrastructure appears to be in poor condition north of Essex Street. (We will need to know its STB status).

The MVPC staff could not find any evidence of active railroad right-of-way maintenance north of Haverhill Street. South of Haverhill Street, the right-of-way shows evidence of infrequent brush clearing, with progressively thicker growth points north. The at-grade crossings are the presumed responsibility of the MBTA (owner) or PanAm Railways

(operator); it is also presumed that the MassDOT and the City of Lawrence perform maintenance on the roadways which intersect the right-of-way. ENEL, the corporate successor to the Essex Company, may also own certain rights at the southern end of the M&L where the right-of-way approaches the Great Stone Dam and crosses the Merrimack River. It remains to be determined if there are any high-pressure gas, water/sewer lines, private crossings or other encumbrances within the right-of-way; a detailed title analysis will be required.

Access to the right-of-way is variably open. Some abutters have fenced their properties off; others have unrestricted access or now have access due to fence openings (cuts), and others' buildings or adjacent grades restrict access. The at-grade crossings afford unrestricted access.

Stations and other railroad – related buildings

The MVPC conducted site visits, reviewed maps and information including the Boston and Maine Railroad Historical Society archives to determine the locations and status of such structures. As noted earlier, the removal of the “North Lawrence” passenger station has been field verified. The “Methuen” station is extant, as is a former freight house in the vicinity. The Methuen station is privately owned; it is occupied by several commercial tenants. Ownership of the adjacent freight house remains to be determined.

Mileposts, Markers and Coordinates

The MVPC requested review of the former B&MRR 1914 valuation maps (available only in digitized format) from the Boston and Maine Railroad Historical Society in November 2011 to obtain this information. In addition, the MVPC conducted a Pictometry analysis and assigned coordinates to various structures along the right-of-way. The mileposts were unavailable at the time of writing this report; however, the MVPC is committed to obtaining this information for future project work and recommends field verification as one or more mileposts remain within the right-of-way. As previously noted, the MVPC believes that Pictometry coordinate data will be more useful for this and future shared-use path projects. A few markers were observed in the field.

Drainage structures

A number of culverts channel drainage and/or permit water to flow aside as well as underneath the right-of-way. MVPC staff finds that the right-of-way typically drains by sheet flow to the adjacent grades, which convey drainage to a number of ditches, seasonal and year-round tributaries that parallel and/or cross underneath the right-of-way, ultimately draining to the Spicket and Merrimack Rivers.

The MVPC needs to research if there are any actions being taken in NH or MA relative to periodic flooding of the Spicket River that are connected with the Project.

Bridges:

Lawrence

- Merrimack River. The current structure is believed to have been built about 1850 (requires confirmation) and is the property of PanAm Railways, but is constructed on and over land of ENEL (formerly the Essex Company). Its condition and maintenance records are unavailable to the MVPC.

Lowell Street over the M&L. This timber bridge carries Lowell Street over the right of way; its deck appears to have been substantially rehabilitated. The MassDOT rates it as a _____. A storm water sewer pipe hangs beneath the bridge; it appears to be conveying drainage from Lowell Street east of the bridge and is discharging it to the M&L right-of-way, which has created significant ponding and is accelerating deterioration of the track structure.

- Manchester Street. This bridge conveys the right-of-way over Manchester Street, a City of Lawrence collector street that connects Broadway (Route 28) with the Tower Hill neighborhood, several large cemeteries and streets leading northward into Methuen. The bridge is constructed of steel girders and is supported by cement? Granite? wing walls. The bridge, track and ties are in place. The street underneath the bridge constitutes a topographical low point, and experiences occasional flooding? The roadway clearance is _____, and has been subject to strikes from trucks and oversize vehicles de temps en temps. The MVPC observed that the structure has sustained some damage and loss of section; however, a review by a qualified engineer would be required to assess its condition.

Methuen

- Oakland Avenue. This bridge, cement over steel, conveys Oakland Avenue (a two-lane local street) above the right-of-way. The bridge directly abuts a cluster of residences and small businesses. MVPC staff observations indicate that the bridge appears to be in fair condition; MassDOT records show that the bridge is rated _____. There are no known active plans for rehabilitation or replacement at this time. The right-of-way is narrow at this location, in a steeply sloped cut and looks to be 20' to 25' wide and has only one track.
- Pelham Street. This bridge conveys Pelham Street above the right-of-way and is adjacent to a complicated five-leg intersection. The clearance is _____. MassDOT data indicates that the bridge is rated _____. There are no active plans known of for rehabilitation or replacement at this time. The right-of-way is slightly wider than at Oakland Avenue; it is occupied by only one track.

Roadway crossings.

There are signals, cross bucks, tracks and associated equipment visible at all of the grade crossings. The intersecting streets are typically poorly defined and lack curbs, lane markings or pedestrian amenities.

Tracks, Ties and Roadbed

Visual inspection indicated that these structures are in poor condition. Is there an embargo on the M&L? Is it "exempt"? While there are rails and ties, these are of marginal quality and in poor repair. Sidings exist at several locations; the MVPC presumes that only one of this is served by PanAm Railways at this time. Switches were found to be in very poor condition. These findings should be verified by a qualified railroad consultant, given that elements may be retained for active rail use or require replacement.

Maps, survey and ownership / easement information

The MVPC reviewed B&MRR 1914 valuation maps, community Assessors' Department maps, Sanborn Maps and Pictometry data to obtain preliminary information. The right-of-way in Lawrence and Methuen is reportedly owned by the Massachusetts Bay Transportation Authority, with operating rights held by PanAm Railways. Portions of the right-of-way, particularly south of Essex Street, may be owned by ENEL, the corporate successor to the Essex Company.

The MVPC was able to view only the valuation maps at the Boston and Maine Historical Society Archives in Lowell, MA. The valuation maps show that the right-of-way is of variable width, ranging from 100' or more at its southern end to 20' in the vicinity of Oakland Avenue in Methuen. Important information about roadway crossings, drainage structures and locations of bridges, railroad facilities, etc. is also shown on these maps. The MVPC has contacted the Society to obtain copies of these documents for its records and for future analysis of the M&L Branch.

The MVPC assigned Pictometry coordinates to various features along the right-of-way that are included with this Report (see Attachment D).

Potential right-of-way discontinuities and encroachments

MVPC observed locations at which the project right-of-way appears to be used in part by abutting properties or by others for disposal of trash and other debris are found throughout, the legacy of inactivity. However, the right-of-way in general is remarkably intact.

Further analysis should be undertaken. Field observations should be compared with property data reviews to establish the presence of easements, private grade crossings, utility crossings and purchases of land prior to determining whether abutting properties

have encroached upon the right-of-way. Completion of this section will require review of MassDOT records to determine when any U.S. Surface Transportation Board (STB) actions were recorded for the abandonment of the M&L Branch.

V. Environmental Resources and Considerations

Environmental Resources

The right-of-way is proximate to or crosses several significant environmental features. The Spicket River is perhaps the most prominent feature within the overall Project. The Project context, being chiefly urbanized land, has been significantly altered over time including filling and construction within riverbank areas, tributaries, associated wetlands, and the construction of extensive roadways, drainage facilities and industrial, commercial and residential structures. The right-of-way context changes quickly north of Pelham Street, where the Spicket River and associated wetlands and tributaries appear to have been altered less. It is known that there have been several large-scale projects active in MA and southern NH to reduce flooding and increase storm water management capacity along the Spicket River. In particular, FEMA provided funding to the State of New Hampshire to purchase and remove homes in Salem, NH to create flood storage areas along the Spicket River; this project is multi-phased and remains active. To date, nine homes have been removed.

Review of Massachusetts data indicates the presence of wetland habitats in the Project area. For example, a portion of the right of way is near / adjacent to an area designated by the Commonwealth's Natural Heritage and Endangered Species Program as providing potential wetland habitat for rare wildlife. The Wood Turtle (*Clemmys insculpta*), a species of Special Concern in Massachusetts, is documented as being present in the area. Further, habitat for Blanding's Turtle (*Emydoidea blandingii*-Threatened); Spotted Turtle (*Clemmys guttata*-Special Concern), and Wood Turtle are reported. Finally, vernal pools are present on land adjacent to the Spicket River between _____ these pools are surrounded by relatively dry, forested uplands. Vernal pools typically lack fresh water supplies; are seasonally dry, and are habitat for amphibians and invertebrates.

The following tables provide an overview of species in the project communities that are classified as E (Endangered); T (Threatened), or SC (Special Concern):

Town	Taxonomic Group	Scientific Name	Common Name	MESA Status	Federal Status	Most Recent Observation
	Amphibian	<i>Ambystoma laterale</i>	Blue-spotted Salamander	SC		2008
	Bird	<i>Asio otus</i>	Long-eared Owl	SC		1981
	Dragonfly/Damselfly	<i>Enallagma laterale</i>	New England Bluet	SC		1998
	Fish	<i>Notropis bifrenatus</i>	Bridle Shiner	SC		2007

Reptile	Emydoidea	Blanding's	T	2007
	blandingii	Turtle		
Reptile	Glyptemys	Wood	SC	1998
	insculpta	Turtle		
Vascular Plant	Cardamine	Fen Cuckoo	T	Historic
	pratensis	Flower		
	var.			
	palustris			
Vascular Plant	Eriophorum	Slender	T	Historic
	gracile	Cottongrass		
Vascular Plant	Liatris	New	SC	1874
	scariosa	England		
	var. novae-	Blazing Star		
	angliae			
Vascular Plant	Platanthera	Pale Green	T	1890
	flava var.	Orchis		
	herbiola			
Vascular Plant	Senna	Wild Senna	E	1872
	hebecarpa			
Vascular Plant	Sparganium	Small Bur-	E	1997
	natans	reed		

Town	Taxonomic Group	Scientific Name	Common Name	MESA Status	Federal Status	Most Recent Observation
	Amphibian	Ambystoma laterale	Blue-spotted Salamander	SC		2004
	Bird	Botaurus lentiginosus	American Bittern	E		1992
	Bird	Ixobrychus exilis	Least Bittern	E		2007
	Bird	Vermivora chrysoptera	Golden-winged Warbler	E		1991
	Fish	Notropis bifrenatus	Bridle Shiner	SC		1998
	Mussel	Ligumia nasuta	Eastern Pondmussel	SC		Historic
	Reptile	Emydoidea blandingii	Blanding's Turtle	T		2009
	Reptile	Glyptemys insculpta	Wood Turtle	SC		2000
	Vascular	Houstonia	Long-leaved	E		Historic

Plant	longifolia	Bluet		
Vascular Plant	Scirpus longii	Long's Bulrush	T	2006
Vascular Plant	Sparganium natans	Small Bur-reed	E	1957

Town	Taxonomic Group	Scientific Name	Common Name	MESA Status	Federal Status	Most Recent Observation
	Amphibian	Ambystoma laterale	Blue-spotted Salamander	SC		2004
	Bird	Haliaeetus leucocephalus	Bald Eagle	E		2006
	Bird	Ixobrychus exilis	Least Bittern	E		1992
	Dragonfly/Damselfly	Gomphus vastus	Cobra Clubtail	SC		2004
	Dragonfly/Damselfly	Neurocordulia obsoleta	Umber Shadowdragon	SC		2004
	Dragonfly/Damselfly	Stylurus spiniceps	Arrow Clubtail	T		2004
	Fish	Acipenser brevirostrum	Shortnose Sturgeon	E	E	1991
	Mussel	Alasmidonta varicosa	Brook Floater (Swollen Wedgemussel)	E		Historic
	Mussel	Lampsilis cariosa	Yellow Lampmussel	E		1866
	Mussel	Leptodea ochracea	Tidewater Mucket	SC		1992
	Mussel	Ligumia nasuta	Eastern Pondmussel	SC		1992
	Reptile	Emydoidea blandingii	Blanding's Turtle	T		2009
	Reptile	Glyptemys insculpta	Wood Turtle	SC		2006
	Vascular Plant	Bidens eatonii	Eaton's	E		2004

Vascular Plant	Liatris scariosa var. novae-angliae	Beggar-ticks New England Blazing Star	SC	1932
Vascular Plant	Potamogeton vaseyi	Vasey's Pondweed	E	1973
Vascular Plant	Trisetum spicatum	Spiked False Oats	E	1914

Source: Massachusetts Division of Fisheries and Wildlife
http://www.mass.gov/dfwele/dfw/nhosp/species_info/town_lists/town_g.htm

The MVPC recommends that a more detailed review of the project right-of-way and abutting properties be undertaken to determine the occurrence of these species in the field, particular to their occurrence on or near the future project right-of-way.

Project Considerations

Flood Zones

The Federal Emergency Management Agency (FEMA) maps indicate the presence of specific Flood Zones throughout the project area. While these zones do not preclude the development of this project, its design, construction and operation must follow certain standards and guidelines.

Subsequent project development activities will require delineation of the following flood zones:

- Zone C: Area of minimal flooding
- Zone B: Areas between limits of 100- and 500-year floods
- Zone A14: Areas of 100-year flood

Property-specific FEMA information is available at www.floodsmart.gov.

In Lawrence, the right-of-way between the southern and northern banks of the Merrimack River are principally within Zones ___ and ___. From this point north to most of the right-of-way lies within Zones B and C.

In Methuen, the right-of-way is on the western bank of the Spicket River. Sensitive areas are near the Arlington Mills; the approach to Methuen Square and wetlands between Methuen Square and Salem, NH.

The MVPC recommends that a detailed flood zone analysis be undertaken in a subsequent stage of project development.

Wetlands and Waterways

The Commonwealth of Massachusetts administers the following regulations that appear applicable to the project:

310 CMR 9.00: The Massachusetts Waterways Regulations (Chapter 91) - June 2009
310 CMR 10.00: The Wetlands Protection Act Regulations - June 2009
310 CMR 10.57 (4)(a)3 and (b)3: general performance standards for proposed projects
310 CMR 10.58: Rivers Protection Act, re: Riverfront Areas
310 CMR 13: Inland wetlands orders
Wellhead Protection Regulations, annotated - April 2001

Detailed information on the above regulations is available at <http://www.mass.gov/dep/water/laws/regulation.htm>.

Lawrence and Methuen each have a Conservation Commission that administer their own local wetlands bylaws. A content example relevant to this Study is permitted activities in specific buffer zones around wetlands and waterways:

No Cut – No Disturb Zone: 50' around wetlands
Tree Cutting and Brush Removal permitted, 50' – 100'
Specific resource areas defined in the wetlands regulations - 100'
Rivers or perennial streams: 200'

The project would require MEPA and local Conservation Commission approvals.

Surface Waters

Waters of relevance to this project include the Merrimack and Spicket Rivers; _____, _____ and _____ Brooks, and _____ and _____ Ponds.

Hazardous waste releases and remediation

The MVPC reviewed the U.S. Environmental Protection Agency's Region I website and the Massachusetts Department of Environmental Protection's site database (<http://db.state.ma.us/dep/cleanup/sites/SearchResults.asp>) to identify documented releases in the immediate vicinity of the M&L Branch right-of-way. The MVPC also collected information on the status of these specific releases (see Appendix). Below is a summary of MVPC's research:

Municipality	Address	Date Reported	Type	Status
Lawrence	600 Essex Street	10/12/10	UST-oil	Closed
Lawrence	7-11 Broadway	04/05/07	Chemicals	Closed
Lawrence	50 Bradford Street	04/30/09	Chemicals	Closed
Lawrence	431 Haverhill Street	10/01/93	Chemicals	Closed
Lawrence	6 West Street	01/15/1990	Chemicals	Closed

Lawrence	111 May Street	08/22/03	Oil	Open
Lawrence	45-65 Manchester St	12/03/1999	Hyd. Oil, other oil	Closed
Lawrence	75 Manchester Street	05/20/03	Oil, 50 gals	Closed
Lawrence	85 Manchester Street	01/17/00	Lead, Arsenic, Benzofluorethene	Closed, AUL
Methuen	Chase Street			Closed
Methuen	39 Oakland Avenue	07/15/93	Waste Oil	Open
Methuen	76 Union Street	01/25/07	UST (oil)	Closed
Methuen	15 Pelham Avenue	06/07/08	Transformer fluids	Closed
Methuen	Old Ferry Road	10/16/02	Hydraulic Oil	Closed
Methuen	54 Osgood Street	01/15/94	Various	Open
Methuen	Lowell St. Bridge	05/17/02	UST (oil)	Closed
Methuen	6 Lowell Street	12/01/99	Various	Closed
Methuen	7 Lowell Street	04/21/94	Gas, 1000 gal.	Open
Methuen	490 Broadway	01/15/90	Unknown	Closed
Methuen	484 Broadway	07/15/93	Unknown	Closed

MassDEP records capture only those releases reported in recent decades.

Historic data reviewed for this Study show that most of the M&L right-of-way and properties abutting the M&L right-of-way have been in almost continuous industrial and commercial use since the M&L was established. Railroad operations are presumed to have generated significant quantities of coal and oil byproducts; arsenic and other compounds present in railroad ties as well as herbicides, and lubricating oils. It is presumed that the right-of-way's inactivity, natural processes and gradual cessation of industrial activity have prevented additional contamination from accumulating.

Land uses within ½ mile of the right-of-way

In Lawrence, the project right-of-way crosses industrial land, the Merrimack River and an urbanized post-industrial community comprised of both small and large commercial properties. Records show that land immediately north of the Merrimack River Bridge was occupied by the Pacific Mills; lumber, coal and steel businesses, an extensive railroad freight yard, and other manufacturing interspersed with multifamily residential structures. There is an inactive steel distributor. Much of the urbanized area at the southern end of the M&L Branch (south of Haverhill Street) has experienced substantial structure decay, abandonments, fires, and demolition (i.e. Merrimac Paper). Nonetheless, various buildings, garages and foundations remain in place. Business activity in this segment is geared to vehicle repair, strip commercial stores, fast-food restaurants. Plastics manufacturing operations are active at 265 Lowell Street. There are various automobile repair businesses adjacent to the Project. However, there is significant vitality just east of the right-of-way along Broadway.

Industrial and commercial properties gradually mix with dense multifamily residential properties in the segment between Haverhill and Manchester Streets. The right-of-way subsequently follows the western bank of the Spicket River in the vicinity of the

Arlington Mills – and to the west it abuts (name) large cluster of cemeteries on Currant Hill Road / Railroad Avenue. This right-of-way segment is somewhat isolated, and with the exception of mixed residential and commercial properties in downtown Methuen (and former mill properties converted to residential) traverses wooded areas.

Other structures and uses in the project area

Well heads and fields. There are numerous groundwater monitoring wells adjacent to the project right-of-way in both Lawrence and Methuen. A review of documentation for both Lawrence and Methuen indicates that the project area is served by a municipal water supply, which is sourced from the Merrimack River via Tower Hill reservoir. The project's utilization of existing rights-of-way is not expected to have any functional relationship with or impact upon such structures.

Drainage and Sewerage. The project area is chiefly served by older combined sewers which permit mixing of drainage and sewage during high weather events, and periodic concurrent discharges to the Spicket and Merrimack Rivers waterways via combined sewer overflows. Both of these rivers functioned as open sewers until the advent of EPA regulations. There have been extensive improvements made to portions of the Spicket River to the southwest of the Project, and both the Spicket and Merrimack Rivers' conditions have improved greatly concurrent to the demise of traditional manufacturing activities. It is presumed that the Project will improve drainage quality due to the removal of debris and the repair and/or upgrading of existing drainage structures where required.

Historic sites and properties. MVPC reviewed documentation for these resources using Commonwealth of Massachusetts, City of Lawrence Public Library and City of Methuen online data, and the resources of the Immigrant City Archives.

Arlington Mills
The Great Dam
Former Opera House
Searles Organ Hall

VI. Public Involvement in Project

The public's involvement in the development of this Project varies according to each community context. In Lawrence, Groundwork Lawrence (GWL) is establishing the public involvement plan for its segment of the overall Project. The City is focused on economic revitalization projects at several locations along the right-of-way, and on working with PanAm Railways to determine the future of freight rail service. GWL and the City have already collaborated on the development of the Spicket River Greenway, and the Manchester Street Playground to which the future path should connect. GWL, Lawrence CommunityWorks (LCW) and the City have already committed extensive planning and other resources toward the development of a path network linking several Lawrence neighborhoods. Most recently, GWL engaged an AmeriCorps volunteer to begin talking with area residents, businesspeople and other community stakeholders to build Project support.

In Methuen, bicycling and walking advocates have led local efforts to convert the M&L Branch into a shared-use path. Support for the Project has been generated in the City's Historic District Commission, its Open Space and Recreation Committee, and the Project is referenced in the City's 2007 Master Plan. The MVPC is assisting the City with preparation of an updated Open Space Plan, which includes the Project.

VI. Overview of Trail Components

The Project is defined as a shared-use path in accordance with the following guidance:

<p>AASHTO Bicycle Facilities Guide</p> <p>http://design.transportation.org/Documents/DraftBikeGuideFeb2010.pdf</p>	<p><i>A bikeway physically separated from motorized vehicular traffic by an open space or barrier and either within the highway right-of-way or within an independent right-of-way. Shared use paths may also be used by pedestrians, skaters, wheelchair users, joggers, and other non-motorized users.</i></p>
<p>U.S. Department of Transportation, Federal Highway Administration</p> <p>http://www.fhwa.dot.gov/environment/bikeped/freeways.htm</p>	<p><i>The term "shared use path" means a multi-use trail or other path, physically separated from motorized vehicular traffic by an open space or barrier, either within a highway right-of-way or within an independent right-of-way, and usable for transportation purposes. Shared use paths may be used by pedestrians, bicyclists, skaters, equestrians, and other non-motorized users.</i></p>

Source: <http://www.access-board.gov/sup/anprm.htm>

The project is proposed to be designed for non-motorized transportation connecting neighborhoods in Lawrence and Methuen. It will connect several of the MVPC region's concentrated development centers, and will provide regional recreational opportunities and access to several environmentally significant areas. The Project is intended also to connect with the future Border to Boston and Merrimack River Trails.

The generous width of the Project right-of-way between the Merrimack River and Haverhill Streets in Lawrence might afford an opportunity for transit to share use of the right-of-way. The MVRTA may wish to consider this option to reduce travel times during peak travel periods, when Broadway (Route 28) is particularly congested. It is also the MVPC's intention to preserve PanAm Railways' freight service to customers in this same segment.

The combination of potential user groups requires that the Project accommodate users with a wide range of abilities and interests. In some segments where the right-of-way is isolated from the abutting neighborhoods the MVPC proposes that the Project design prioritize this requirement.

The ability to consider alternative path alignments depends upon the context of properties abutting the Project right-of-way, which predictably vary in size, ownership and use. The Project segment within Lawrence is perhaps the most urbanized, and perhaps abuts some of the largest land parcels and buildings. The Project will benefit from the relative absence of private crossings.

The project's path surfaces and amenities should compliment or match connecting facilities. MVPC recommends that the path be surfaced with bituminous concrete. A shared-use path can be flexibly designed; on average, a 12' wide bituminous concrete paved travel surface marked for bi-directional travel. This surface will be installed with sufficient protection to safeguard against edge raveling, and will be sloped in one direction (not crowned) to facilitate drainage. The path will provide for amenities including benches, lighting and signage, waste receptacles, way-finding and interpretive information, and security / safety equipment. Path at-grade crossings will be required, plus gates / bollards to prevent unauthorized vehicles from entering / exiting the path. Guardrails will be required in some locations to protect trail users where there are obstructions or steep slopes adjacent to the trail. The MVPC recommends that project stakeholders consult sample design cross-sections that are available in various studies including the 2007 FS&T study prepared for the Town of Georgetown. Excerpts of general guidelines can be found in Appendix F of this Study.

In all three communities, the project will require maintenance, restoration and/or replacement of certain bridges and/or culverts crossing small waterways. The MVPC reviewed information for other active shared-use trail projects in the Commonwealth, but was unable to find specific technical or cost data to prepare estimates within the scope of this Study. It appears that any bridge or culvert will be required to meet H-20 design standards, as was projected in the 2007 FS&T Town of Georgetown Study.

Access Points

The trail should be accessible from adjacent streets and public facilities, to maximize Project utility and public safety. The right-of-way is perpendicular to number of streets in all of the Project communities, which lead to residential, employment and transportation nodes:

- Lawrence: Broadway, Haverhill and Manchester Streets
- Methuen: Arlington Mills, Railroad Avenue, Methuen Square

MVPC proposes to work with the trail communities in later project phases to analyze and determine the number and location of local access points.

Trail and Roadway Crossings

The project would require the construction of several roadway crossings in Groveland, most of which require reworking of former at-grade railroad crossings. The Groveland crossings at Center Street and Route 97 west of the Bagnall School are perhaps the most challenging given existing approach geometry. If the project is designed to follow the existing right-of-way between Center Street in Groveland and Trestle Way in Georgetown, a grade-separated crossing permitting the path to cross under Route 97 at Trestle Way in Georgetown would likely be desirable due to roadway geometry, sight distances, travel speeds and projected shared-use path user characteristics. The MassDOT Design Guidebook advises that trail underpasses typically require a path

vertical clearance of 8 to 12 feet. The Guidebook advises further that “there are no clear warrants” that mandate grade separation; therefore, it will be up to the project designer, the communities and other stakeholders to decide whether to grade-separate the path.

Parking

MVPC staff finds that parking could be developed (or existing supplies utilized) in several locations to serve the shared-use path, including:

- Parker Street (South Lawrence)
- Pacific Mills or Pemberton Park, Lawrence
- Haverhill Street
- Former B&MRR Methuen station, Railroad Avenue

Projected Facility Users

Consistent with prior feasibility studies, it is essential to identify the types of bicyclists and other users that the facility will accommodate. One solution to this challenge is to start with the concept of “design cyclist” put forth by the FHWA (*Selecting Roadway Design Treatments to Accommodate Bicycles*, Publication No. FHWA-RD-92-073, January 1994):

Group A: Advanced Bicyclists - Experienced riders who can operate under most traffic conditions. Such bicyclists require direct access to destinations; Operate at maximum speed with minimum delays. Group A riders require sufficient roadway space or shoulder so that bicyclists and motorists can pass without altering their line of travel.

Group B: Basic Bicyclists - Casual or new adult and teenage riders who are less confident of their ability to operate in traffic without special provisions for bicycles. These bicyclists require comfortable access to destinations; a direct route to one or more destinations, but on low-speed, low traffic-volume streets or designated bicycle facilities; well-defined separation of bicycle and motor vehicles or separate bike paths.

Group C: Children - Pre-teen riders whose roadway use is initially monitored by parents. These riders require: access to schools, recreation facilities, shopping, or other residential areas; residential streets with low motor vehicle speed limits and volumes; well-defined separation of bicycles and motor vehicles or separate bike paths; establishment and enforcement of speed limits; implementation of traffic calming; provision of wide outside lanes in urban settings and usable shoulders in rural settings.

A future M&L Branch shared-use path will most likely be used by Groups B and C, with some use by Group A bicyclists; pedestrians; in-line skaters, and persons utilizing approved mobility devices. When joined with other trails now in development, the project is expected to be particularly attractive to bicyclists. Further, the project's potential for shared use of existing roadways in some locations renders these rider classifications even more relevant.

Activity Centers To Be Served

The project would directly connect to the City of Lawrence's Canal District, its downtown, indirectly to the Arlington neighborhood in Lawrence and Methuen, and to downtown Methuen.

Right-of-Way Requirements

The approximate Project distance is _____miles. A project right-of-way that is sufficiently wide enough to accommodate a 15' average cross-section is presumed; a scan of the B&MRR 1914 track valuation maps showed that the right-of-way typically ranged from 20' to 25' wide. There will be instances where the right-of-way will prove ample as well as constrained owing to the surrounding grades and overhead structures. Please refer to Appendix F for sample shared-use path design guidelines.

Right-of-Way Ownership and Control

The MVPC's understanding is that most of the right-of-way is owned and/or controlled by PanAm Railways according to whatever rights it acquired from former corporations that established and / or operated it. To-be determined segments of the right-of-way in Lawrence in the vicinity (and possibly including) the Merrimack River are reportedly owned by ENEL, the corporate successor of the Essex Company); The MVPC recommends that a comprehensive title search and property report be performed by a qualified real estate professional. This work will be required to fully understand the status of the project right-of-way, including assignment of rights and tasks required.

Project Development Cost Estimates

The MVPC sampled several recent reports for other rail-to-trail projects to begin developing some project cost information, as follows:

Activity	Estimated Cost
Due Diligence	\$100,000- \$200,000
Design (+-10% of construction cost)	\$
General path construction	\$ million

Due diligence activities are assumed to include property documentation research, development of information required to secure necessary rights. The MVPC assumed an average \$1,000,000 per mile construction cost (excluding bridges, lighting and

drainage structures). For bridges, a controlling design factor will be the structural load rating required (H-20 v. H-10, whereby H-10 is suitable for path maintenance vehicles and H-20 can accommodate heavier construction and emergency vehicles), width of crossing, and field conditions including any existing abutments or structures. The Project may present an opportunity to replace the Manchester Street Bridge with a new structure that provides more clearance for the roadway below, to reduce the chance of vehicle strikes. Use of prefabricated bridges may be a cost-effective option for this project. Each of the project communities will need to determine what types of amenities to be programmed into the project, i.e. street furniture, art, lighting.

Project Maintenance Responsibilities

The MVPC anticipates that once constructed the project will be maintained by the Cities of Lawrence and Methuen. The trails to which the Project will connect may be maintained by their host municipalities, or by other organizations. Whoever becomes responsible would be responsible for maintenance activities including routine inspections, public safety monitoring and response, and provision of lighting in some segments (if included). At such time as the project enters the design phase, a maintenance plan should be developed with short, medium and long term requirements for each of the municipalities. There would be opportunities for the communities to organize a 'friends of the shared-use path' organization or to utilize their recreation or trail committees, or similar groups to commit time and resources toward maintaining the path. This approach has worked very well for other shared-use path projects including the nearby Bruce Freeman Bikepath in the Northern Middlesex MPO region, and is strongly recommended.

Good information is available to aid development of a project maintenance plan. For example, the Rails-to-Trails Conservancy (R2TC) in 2005 released an updated version of its report, Rail-Trail Maintenance & Operation in which R2TC surveyed 100 trails on primary management and design topics including liability, surfaces, drainage, amenities, signs, bridges and budgets. The report is available for download at: http://www.railstotrails.org/resources/documents/resource_docs/maintenance_operation_s-report.pdf

VII. Project Implementation Plan

The Project can be implemented in multiple phases as a series of discrete tasks. The Methuen segment of the Project right-of-way has already been secured in a long-term lease with the MBTA; it is anticipated that the Lawrence project segment could also be secured by a similar arrangement with the MBTA and/or other owners. If the railroad retains ownership, any structure removals will likely be undertaken by the railroad to obtain materials' salvage values. Alternately, the communities in concert with the MBTA may be able to engage an organization such as Iron Horse Preservation, a non-profit rails-to-trails advocacy group. Iron Horse Preservation in 2011 removed tracks on several rights-of-ways in northeastern Massachusetts for preparation of the Border to Boston and Bradford Rail Trails