

# Mount Hope Bay Greenway Feasibility Study



**February  
2021**

Prepared by Stantec for the City of Fall River

# ACKNOWLEDGMENTS

---

## **FALL RIVER BICYCLE COMMITTEE**

Al Lima

## **CITY OF FALL RIVER**

Bill Kenney, AICP, City Planner

Bill Roth, Former City Planner

## **STANTEC**

Aleece D'Onofrio, PE

Rachel Santarsiero, EIT

Alison LeFlore, AICP

Please Note: This document has been formatted for web viewing, a printable version is available upon request. Page numbers will vary slightly between versions.



---

# CONTENTS

<b>INTRODUCTION &amp; SUMMARY</b>	<b>1</b>
Summary	2
<b>VISION</b>	<b>6</b>
<b>PHYSICAL INVENTORY &amp; ASSESSMENT OF THE RIGHT-OF-WAY</b>	<b>8</b>
Former Railroad Corridor	8
Site Conditions	9
Environmental Resources	16
Cultural and Historical Resources	24
<b>CONCEPTUAL DESIGN &amp; IMPLEMENTATION</b>	<b>27</b>
Rail-With-Trail or Rail To Trail	27
Trail Design Elements	27
Design Criteria	28
Trail Type	28
Trail Surface Material	31
At-Grade Trail/Roadway Crossing Treatment	32
Conceptual Trail Design	33
Conclusion	39
Project Development Costs	40
Property Agreements	40
Construction Cost Estimate	40
Design Cost Estimate	40
Project Funding	44
<b>REGULATORY REQUIREMENTS</b>	<b>49</b>
Potential State Environmental Permits and Approvals	49
Potential Federal Environmental Permits and Approvals	49
Archaeological and Historical Sites and Districts	50
National Environmental Policy Act (NEPA)	50
<b>APPENDIX</b>	<b>51</b>

---

# FIGURES

---

Figure 1: Regional Context	3
Figure 2: Local Context (South)	4
Figure 3: Local Context (North)	5
Figure 4: South Coast Rail Proposed Full Build	7
Figure 5: Land Use (South)	10
Figure 6: Land Use (North)	11
Figure 7: Drainage Issues (South)	14
Figure 8: Drainage Issues (North)	15
Figure 9: Hazardous Materials (South)	18
Figure 10: Hazardous Materials (North)	19
Figure 11: Environmental Resources (South)	20
Figure 12: Environmental Resources (North)	21
Figure 13: FEMA Floodplain (South)	22
Figure 14: FEMA Floodplain (North)	23
Figure 15: Historic and Cultural Resources (South)	25
Figure 16: Historic and Cultural Resources (North)	26
Figure 17: Conceptual Mount Hope Bay Rail-Trail Section (top right)	28
Figure 18: Typical Rail-Trail Section	28
Figure 19: Conceptual Mount Hope Bay Rail-With-Trail Section (bottom left)	29
Figure 20: Typical Rail-With-Trail Section	29
Figure 21: Typical At-Grade Trail Crossing Layout	32
Figure 22: Mount Hope Bay Greenway Proposed Segments (South)	34
Figure 23: Mount Hope Bay Greenway Proposed Segments (North)	35
Figure 24: Almond Street Bridge Cross Section Plan	38
Figure 25: Potential Project Timeline Flowchart	44

# TABLES

---

Table 1: Unit Costs for Major Work Items	41
Table 2: Estimated Construction Cost By Segment	42
Table 3: Potential Funding Sources	45

---



# INTRODUCTION & SUMMARY

The City of Fall River is a vibrant, urban community that demonstrates its history through its waterfronts, mill buildings, predominately multi-family housing, parks, and ethnic neighborhoods. More than half of the city's area is forest, wetlands, and water - most of these natural areas are permanently protected watershed land or part of the Southeast Massachusetts Bioreserve. Fall River's geographic location provides convenient motorized access to Interstate 195, State Routes 6, 24, and 79 as well as several minor arterial routes.

The Fall River Bicycle Committee has been working to create recreational opportunities and provide alternative means of travel to points of interest both on a local level and working with partner organizations to develop future regional connections (Figure 1). Already, the Fall River Bicycle Committee has connected with other trail organizations and gained support for adjoining trail systems, such as the Alfred J. Lima Quequechan River Rail Trail.

The Mount Hope Bay Greenway (MHBG) is a proposed shared-use trail through the City of Fall River from the Battleship Cove area along the railroad Right-Of-Way (ROW) corridor south to the State of Rhode Island border at Tiverton, RI. The project area will run approximately 3-miles along the railroad ROW. The ROW is owned by the Massachusetts Department of Transportation. In total, the ROW extends 8-miles from Freetown, MA to Tiverton, RI. Simultaneously, the Town of Tiverton is exploring the feasibility of developing their portion of the MHBG, which would extend the greenway to the Sakonnet River Bridge in Rhode Island. Developing the whole corridor into a continuous greenway would provide unparalleled recreational access and create a regional destination for residents and visitors alike.

Fall River's portion of the MHBG will enhance bicycle and pedestrian connectivity from Heritage State Park and Battleship Cove to Tiverton, Rhode Island and will connect a variety of green spaces, commercial areas, and existing and proposed trail systems in Fall River. The majority of the project area lies within Environmental Justice Communities, and the MHBG will ensure low-income residents and communities of

color have a meaningful way to connect with the waterfront and surrounding neighborhoods. The establishment of a trail system aligns with Fall River's 2009-2030 Master Plan.

The purpose of this Study is to evaluate the feasibility of converting the former rail corridor to a shared-use trail facility. The study addresses existing site conditions and key design and constructibility issues related to the MHBG. Project activities included identifying potential alternative routes for local connections, key implementation activities, and funding necessary to advance the project.

In the past, the City of Fall River has considered pursuing extended rail service to serve the businesses along the ROW and Wastewater Treatment Plant at the southern terminus of the potential greenway. The northern terminus of the MHBG, located at Battleship Cove, will also be the location of the future South Coast Commuter Rail Station. If developed, this rail connection would need to share the ROW with the MHBG.

When a shared-use path is adjacent to and follows the same ROW as an active rail line, it is called a rail-with-trail. This is different from a rail-trail, which is when a railroad corridor is converted into a shared-use path. Due to topography constraints within the ROW there are areas along the preferred route of the MHBG that would require typical rail-with-trail dimensional requirements to be reduced to accommodate both the MHBG and future rail service.

Should the City decide to pursue extended rail service, a rail feasibility study is the next step of the process. This feasibility study should evaluate both the engineering feasibility and economic viability of the proposed extension. Determining the rail extension's feasibility will be key to the City's decision to either continue with a rail-with-trail or rail-trail design. If the City decides to progress a rail-with-trail design, the two projects should be advanced simultaneously. If the City chooses to pursue a typical rail-trail design, the MHBG can progress quickly to the engineering and design phase. Rail-trail projects like this typically take 4-5 years to complete. In addition to recommending an approach to trail development, the study identifies connections to adjacent neighborhoods

and points of interest. The study provides a series of recommendations and alternatives for the City to consider.

The Fall River Bicycle Committee has been proactive in securing funding to pursue a variety of projects. This study was funded through the City's Community Preservation Act program. This project began in late 2019 and a public workshop was scheduled for March 2020. Unfortunately, the global COVID-19 Pandemic affected this project's progression and plans for public engagement. The public workshop was

canceled and converted into a month-long online charrette. City staff, the Fall River Bicycle Committee, and other stakeholders shared the workshop links where participants were invited to share their opinions on the MHBG. The online charrette included both an interactive map where people could identify areas for connectivity and future development, desired amenities, and areas of concern. Community members were also invited to answer a series of questions in an online survey. The feedback from these two outreach strategies were incorporated into this conceptual design.

## Summary

*To determine the overall feasibility of the MHBG, it is critical to evaluate which sections successfully meet the project goals and are consistent with the community needs. Design and construction costs, discussed in the next section, are also a factor. As mentioned previously, the City's decision about pursuing extending rail service beyond the proposed Battleship Cove MBTA Station will greatly impact the next steps in the design of the MHBG. Some segments of the Greenway could be constructed prior to a decision about extended rail service but would likely need to be reconstructed if the railroad is extended. The ability to implement the various sections of this project will require commitment from key project partners as well as securing the various necessary design and construction funding.*

*Based on a review of existing conditions, future development plans, and infrastructure improvement projects along and adjacent to the former rail corridor, developing the entire 3 miles of former railroad corridor as a rail-with-trail may not be feasible without substantial financial investment. However, there are opportunities to develop the corridor utilizing the types of facilities discussed in the Trail Type section of this report. Each type of greenway would attract a variety of users and provide the desired recreational amenity.*

FIGURE 1: REGIONAL CONTEXT

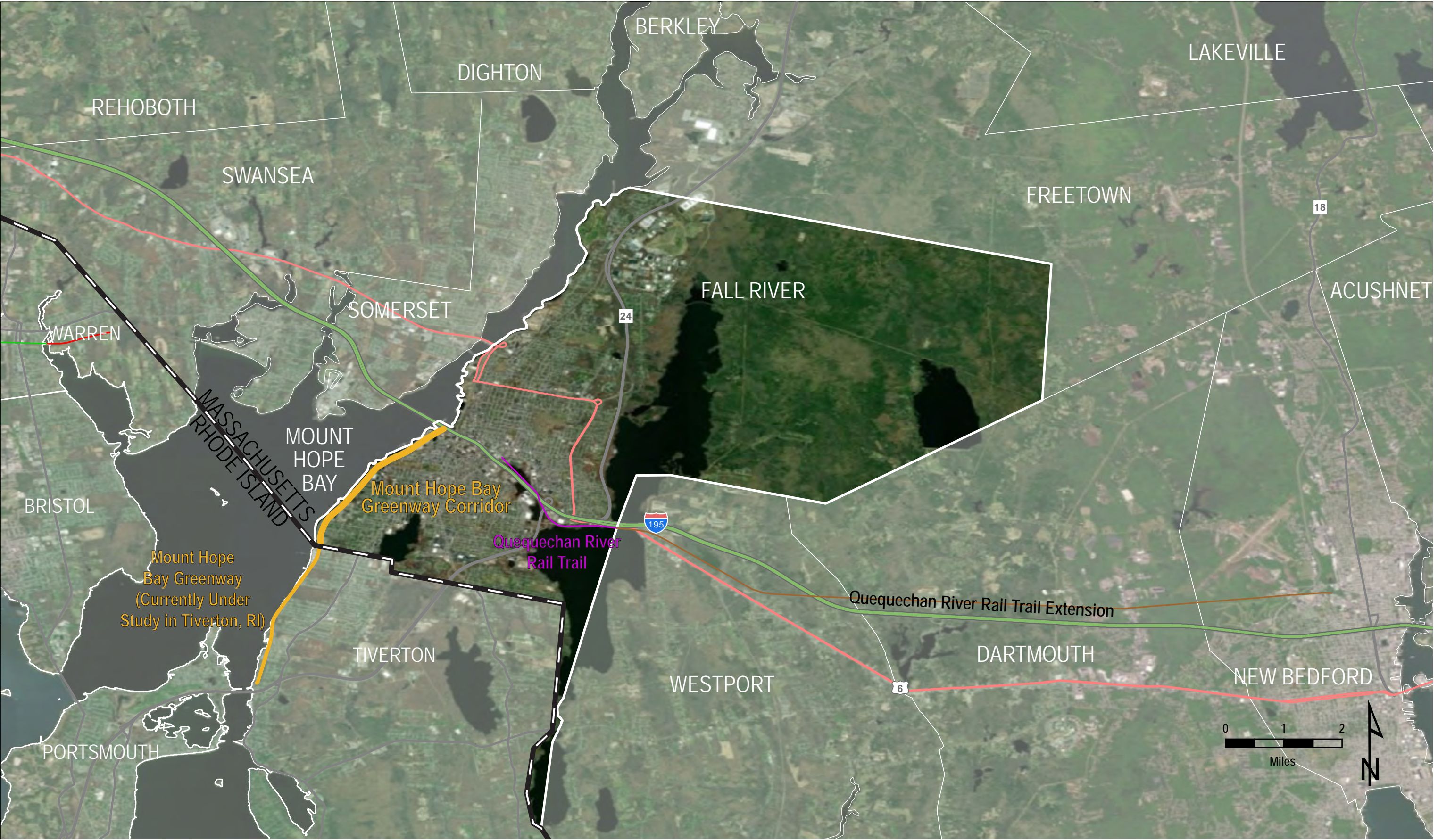


FIGURE 2: LOCAL CONTEXT (SOUTH)



- Legend
- Mount Hope Bay Greenway Corridor
  - Park



FIGURE 3: LOCAL CONTEXT (NORTH)



- Legend
- Mount Hope Bay Greenway Corridor
  - Park





## VISION

The creation of a shared-use trail facility is intended to provide non-motorized connections to places people want to go. Imagine a safe and direct route to walk or ride your bike from your home to Kennedy Park or Battleship Cove, all the way to Tiverton, RI. A city-wide trail system will strengthen and enhance Fall River's neighborhood, business, civic, natural and play areas. A trail system would not only connect neighborhoods locally, but also provide for future connections at a regional level across municipalities and states. Potential regional connections include the Quequechan Rail Trail through Fall River and the entirety of the south coast trail network. One of Mayor Coogan's priorities is to make Fall River a more bike friendly community.

As mentioned previously, the Town of Tiverton is also developing a concept for their portion of the MHBG. In addition

to connecting with the MHBG in Tiverton, Fall River's portion of the greenway would provide an integral link to the South Coast Bikeway and the Providence to Provincetown Bikeway - extending to the Sakonnet Bridge, across to Portsmouth, and maybe someday to Newport, RI.

The City of Fall River's 2009 Master Plan identified a need to provide improved pedestrian and bicycle access throughout the City. Some of the goals identified by the Master Plan Steering Committee and Fall River Residents are:

- Develop waterfront areas for additional public access and recreation including other multipurpose trails.
- Have a renewed and well-maintained park system.
- Construct a network of trails throughout the community as a means of connecting neighborhoods and natural resources.

As envisioned, the MHBG will provide:

- Accessible, equal recreation opportunities for all City residents;
- Improved bicycle and pedestrian access to and from neighborhoods and natural resources;
- A trail network linking open spaces and historical and cultural resources within the City; and
- Future opportunities to connect to regional trail systems.

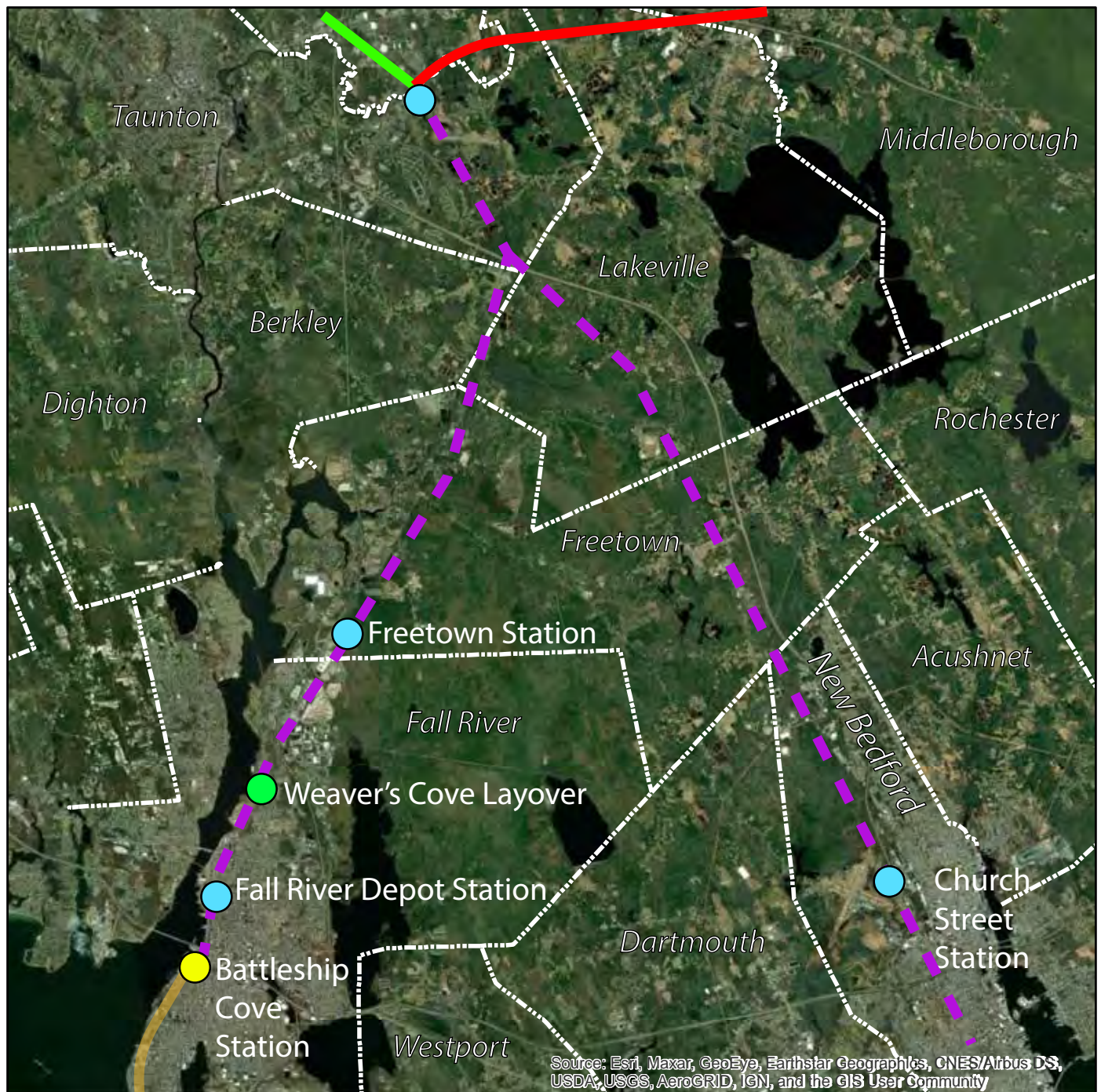
*Battleship Cove (top left)*

*Fall River Heritage State Park (bottom left)*

*Atlantic Avenue (right)*



FIGURE 4: SOUTH COAST RAIL PROPOSED FULL BUILD



### Legend

- Future Commuter Rail (Active Freight Service)
- Future Commuter Rail (Out of Service Line)
- Middleborough Secondary Line
- Mount Hope Bay Greenway Corridor
- New Station - Full Build
- New Station - Phase 1
- New Layover - Phase 1





# PHYSICAL INVENTORY & ASSESSMENT OF THE RIGHT-OF-WAY

This study provides an overview of the key design issues, opportunities, and constraints that informed the conceptual design for the proposed MHBG. The review included the railroad corridor, existing site conditions, environmental resources, and permitting requirements.

## Former Railroad Corridor

This section provides information about the history of land ownership along the Fall River Subdivision railroad alignment.

### History of Rail Service

The *Rail Lines of Southern New England: A Handbook of Railroad History* by Ronald Dale Karr, provides background on when the Fall River Subdivision line was built and how it is currently operated. The below paragraphs and table summarize Karr's research on these lines.

The Fall River Subdivision is a freight railroad line owned by the Massachusetts Bay Transit Authority (MBTA), with freight operations handled by the Massachusetts Coastal Railroad. It was formerly owned and operated by CSX Transportation. The line runs from the New Bedford Subdivision at Myricks south to Fall River along a former New York, New Haven, and Hartford Railroad line. At its south end, at the Rhode Island state line in Fall River, it becomes a line of the Providence and Worcester Railroad.

The Fall River Branch Railroad completed the line from Myricks south to Fall River in 1845. The Old Colony and Newport Railway extended the line to Newport, Rhode Island in 1864. The line later became part of the NYNH&H until Penn Central took over in 1968, and Conrail took over in 1976. The Fall River Subdivision was assigned to CSX in 1999 after the breakup of Conrail.

On October 2, 2008, the state government announced an agreement with CSX Transportation for the purchase and upgrade of several of CSX's freight lines in the state. CSX agreed to sell the Fall River Secondary and New Bedford Secondary for use by the South Coast Rail project, as well as the Grand Junction Branch, the Framingham-to-Worcester section of the Worcester Line, and the South Boston

Running Track. Other parts of the agreement included plans for double-stack freight trains west of Worcester and the abandonment of Beacon Park Yard. The agreement was signed on September 23, 2009. On June 11, 2010, the state and CSX completed the first phase of the agreement, including the transfer of the South Coast Rail lines to MassDOT; the Massachusetts Coastal Railroad assumed freight rights on the two lines. The two lines were sold for \$21.5 million. The line is currently primarily used to transport chemicals to Borden & Remington in Fall River (Karr, p. 331-334).

### South Coast Rail

The MBTA is currently engaged with station site planning to extend commuter rail service south to Fall River, MA and New Bedford, MA. This commuter rail service would link the cities of Fall River, East Taunton, and New Bedford to the MBTA's commuter service via the Middleborough/Lakeville line. The southernmost planned station proximate to the MHBG would be located at Battleship Cove in Fall River. The Battleship Cove Station is part of Southcoast Rail's Full Build and is currently in the preliminary design phase. As part of Southcoast Rail's Phase 1, a station is proposed in Fall River north of the MHBG study area at Fall River Depot.

Phase 1 preliminary construction began in 2019, with service anticipated to begin in late 2023.

### ROW Width

In general, based on a review of the Railroad Valuation Maps (Val Maps) the existing ROW for the study corridor spans a width of 70'-80'. Some of the most popular records among historic preservationists, railroad history experts, and even genealogists are the railroad valuation records of the Interstate Commerce Commission (ICC). These records provide documentation pertaining to the railroads of the United States from their beginning until the 1960s. Most valuation records were created between 1915 and 1920 by the ICC and railroad engineers who undertook a massive project to inventory almost every aspect of the U.S. railroad system for the purpose of determining a net worth for each railroad. This value was then used to calculate passenger and freight rates.

Val Maps provide information about the railroad facilities existing at a particular location, the land owned by the railroad and how it was acquired, and the land adjacent to railroad property during the period 1915-1920. Periodic engineering updates follow changes in facilities and rolling stock held by a railroad from the period of the basic valuation to the 1960s. Val Maps included culverts, bridges, track information, mile markers, round houses, stations, etc. - anything that increased the value of the line.

Along portions of the corridor, available ROW is limited due to the existing topography. The former railroad alignment generally follows the centerline of the corridor ROW and was built in a cut section whereas the tracks are at a lower elevation than the surrounding terrain. This results in a valley like condition, with steep side slopes creating the adjacent embankments. If the rail-with-trail option is selected, slope stabilization design methods would be required to meet spatial requirements for construction. Slope cuts would be required to fit both the rail and trail, potentially increasing project cost significantly. If pursuing a rail-with-trail design for any portion of the MHBG, the design team would need to work

closely with the ROW owner and any potential rail operators to ensure that the greenway design is compatible with potential future rail service.

## Site Conditions

This section evaluates existing site conditions along the ROW to identify potential constraints to converting the former railroad corridor into a shared-use trail. The evaluation of site conditions was completed utilizing existing reports/studies and mapping, aerial orthophotography, state geographic information system (GIS) data, and field investigation.

## Land Use

The study corridor runs south from Battleship Cove and Fall River Heritage State Park to the Tiverton, Rhode Island line. Much of the project area parallels Atlantic Boulevard. The study corridor abuts several types of properties including commercial, residential, and industrial properties, in addition to residences and forest (Figures 5 and 6). The corridor itself is overgrown so it can be difficult to visually verify the location of the extant railway in places, both in aerial photographs and on the ground. Encroachments on the ROW have been observed, but need to be verified via survey.

There are several protected open space and recreational properties along the study corridor. One of these includes Fall River Heritage State Park, a history-themed public recreation area. Heritage State Park encompasses 14 acres beside the Charles M. Braga Jr. Memorial Bridge on Battleship Cove.

Additional open space parcels adjacent to the corridor include:

- Kennedy Park off Bay Street
- Central Park off Central Street
- Abbott Playground off Bay Street
- John. J. Doran Community School
- Matthew J Kuss Middle School

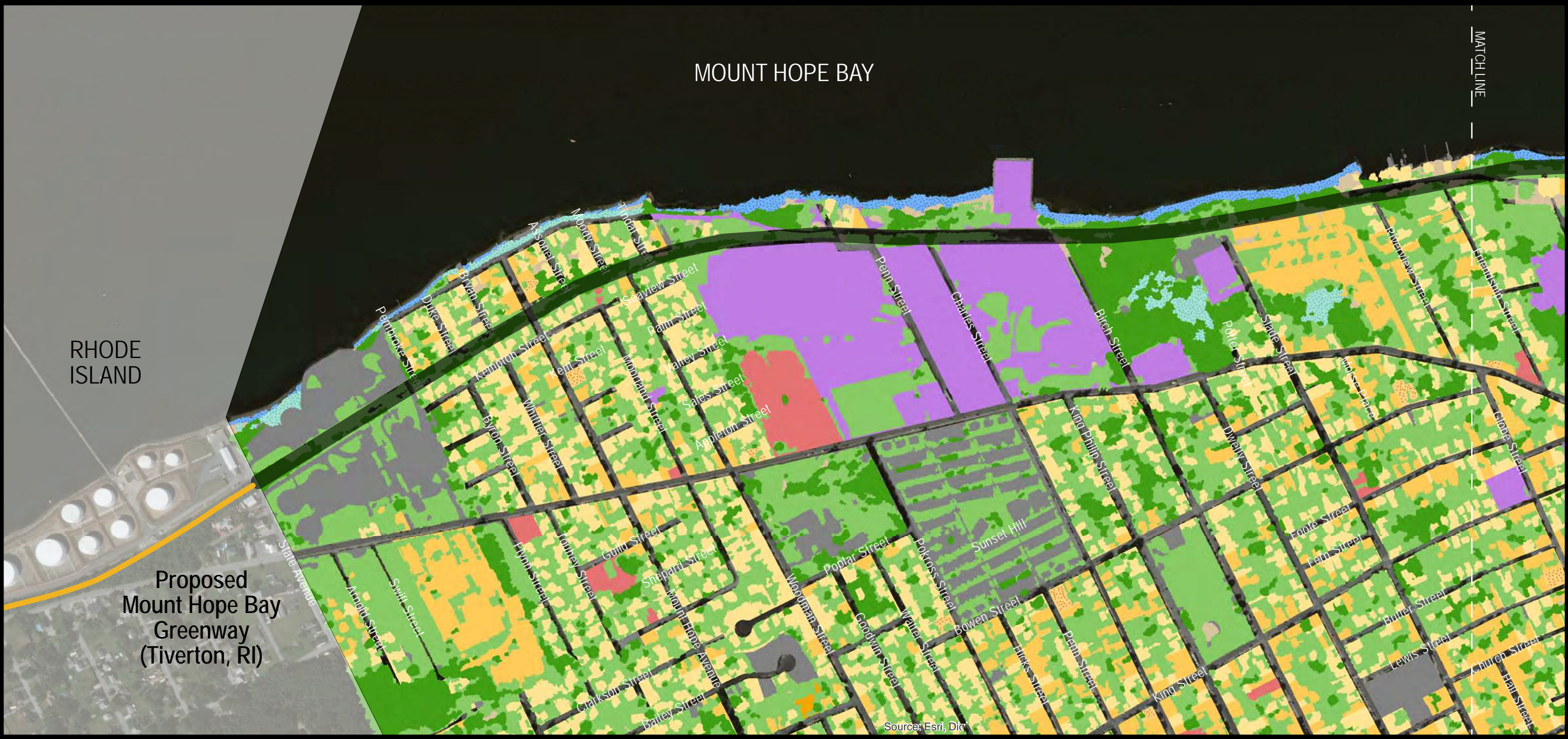
*Cut Section with Steep Side Slopes*



*Old Colony Railroad Yard*



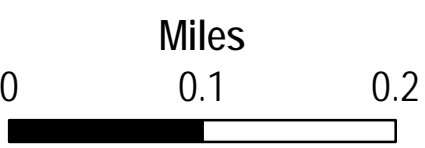
FIGURE 5: LAND USE (SOUTH)



Legend

Residential Land Uses	Other Land Uses	Land Cover
Single Family	Commercial	Impervious Cover
Multi-Family	Industrial	Developed Open Space
Other Residential	Mixed Use	Undeveloped Open Space

Bare Land
Wetland
Unconsolidated Shore



Mount Hope Bay Greenway Corridor





### Legend

## Residential Land Uses

Single Family

Multi-Family

Other Residential

## Other Land Uses

Commercial

 Industrial


Mixed Use

## Land Cover

 Impervious Cover

Developed Open Space

 Undeveloped Open Space

 Bare Land

 Wetland

Unconsolidated Shore



Miles

0                      0.1                      0.2



 Mount Hope Bay Greenway Corridor





Fall River Heritage State Park (left)  
Charles M. Braga Jr. Memorial Bridge (right)

Other areas in the city are also well positioned to develop connections to the proposed MHBG including:

- Businesses along Bay Street
- The Tippy Toboggan Restaurant near Ponta Delgada Boulevard

## Topography

The profile of the main corridor is relatively flat from Battleship Cove to the Rhode Island State Line. The majority of the corridor is part of Massachusetts's coastal lowlands region and is relatively level across the width of the ROW. The profile of the study area appears relatively flat, though sections of the corridor are elevated on an embankment on either side of the abandoned rails.

## Vegetation

The ROW has varying levels of vegetation, including thick grasses which have established along the un-used rail line since the last trains operated. The existing vegetation on adjacent cut slopes provides some screening between adjacent properties and the corridor, particularly during the spring and summer months. Conversely, the portion of Atlantic Boulevard between Penn Street and the Gold Metal Bakery is relatively devoid of vegetation due to intermittent use in previous years.

## Railbed

Based on field reconnaissance, the tracks and rails appear intact along the entire corridor. There are some sections where it is difficult to determine the condition of these rails as they have become buried with low-lying vegetation and debris.

## Road and Rail Crossings

As proposed, there would be a total of five at-grade road crossings along the share-use path portion of the MHBG. Most are on narrow, low-volume, residential streets with only

Typical Vegetation Along ROW



Typical Railbed Condition



local traffic. Mount Hope Avenue connects the neighborhoods surrounding the proposed MHBG with the rest of Fall River and beyond, providing a direct connection through the city to Route 138/South Main Street. In the area of the proposed MHBG, Mount Hope Avenue is not identified by the Massachusetts Department of Transportation as a minor arterial. However, it is identified as a “major road” when it crosses nearby Bay Street. The five at-grade crossings are:

- Birch Street
- Penn Street
- Mount Hope Avenue
- Atlantic Boulevard
- State Avenue

There are a total of four bridge crossings along the proposed greenway. These crossings are:

- Ponta Delgada Boulevard (Above Grade Bridge)
- Almond Street (Above Grade Bridge)
- Club Street (Overhead Bridge)
- Shaw Street (Below Grade Bridge)

## Drainage and Stream Crossings

Along the ROW, several existing bridges and surrounding roads convey natural waterways and drainage to either side of the rail bed. The Val Maps were used as a guide for identifying the culverts and bridges along the corridor during the site visit.

The Val Maps and site visit indicated 11 separate drainage issues along the project corridor (Figures 7 and 8).

1. *Broadway Street, 21st Century Motors Parking Lot:* Runoff from paved used car lot discharges via concrete swale to MassDOT Railroad Right of Way and Track Bed.

*Washout Location at Slade Street (8)*



2. *Middle Street:* Surface runoff from the road has caused two washouts in the track just north of Middle Street.
3. *Matthew J. Kuss Middle School:* Runoff from school discharges on to trackbed through a concrete drainage structure.
4. *Matthew J. Kuss Middle School:* Storm overflow from school drainage pond being discharged onto MassDOT Railroad Right of Way and trackbed causing several washouts and washins.
5. *Draper Street:* Runoff from condos and homes overflows existing trench and culvert.
6. *Friendship Street:* Runoff from road directed into concrete drainage structure on MassDOT Railroad Right of Way which overflows onto track.
7. *Riverview Street:* Runoff from road discharges onto trackbed filling it with dirt and mud.
8. *Slade Street:* Runoff from road discharges onto trackbed filling it with dirt and mud.
9. *Birch Street:* Runoff from road discharges through existing granite arch culvert which is 95% clogged.
10. *Charles Street:* Runoff from road discharges onto trackbed filling it with dirt and mud.
11. *Woodman Street:* Runoff from road discharges onto trackbed filling it with dirt and mud.

Many of the surrounding culverts and swales have not been maintained over time and have become clogged with vegetative debris. Once cleaned, these structures should restore existing drainage patterns along the ROW. However,

*Existing Railbed at Gold Metal Bakery*














*Mount Hope Avenue At-Grade Crossing*



FIGURE 7: DRAINAGE ISSUES (SOUTH)



Legend

- |   |   |  |
|---|---|--|
|  Wooded Marsh          |  Hydrologic Connection     |  Mount Hope Bay Greenway Corridor |
|  Salt Marsh            |  Chapter 91 Jurisdiction   |  Park                             |
|  Beach / Dune          |  Contemporary High Water   |  City Owned Parcel                |
|  Potential Vernal Pool |  Identified Drainage Issue |  |

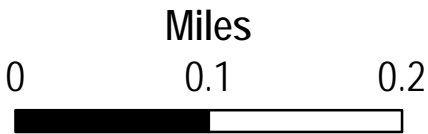
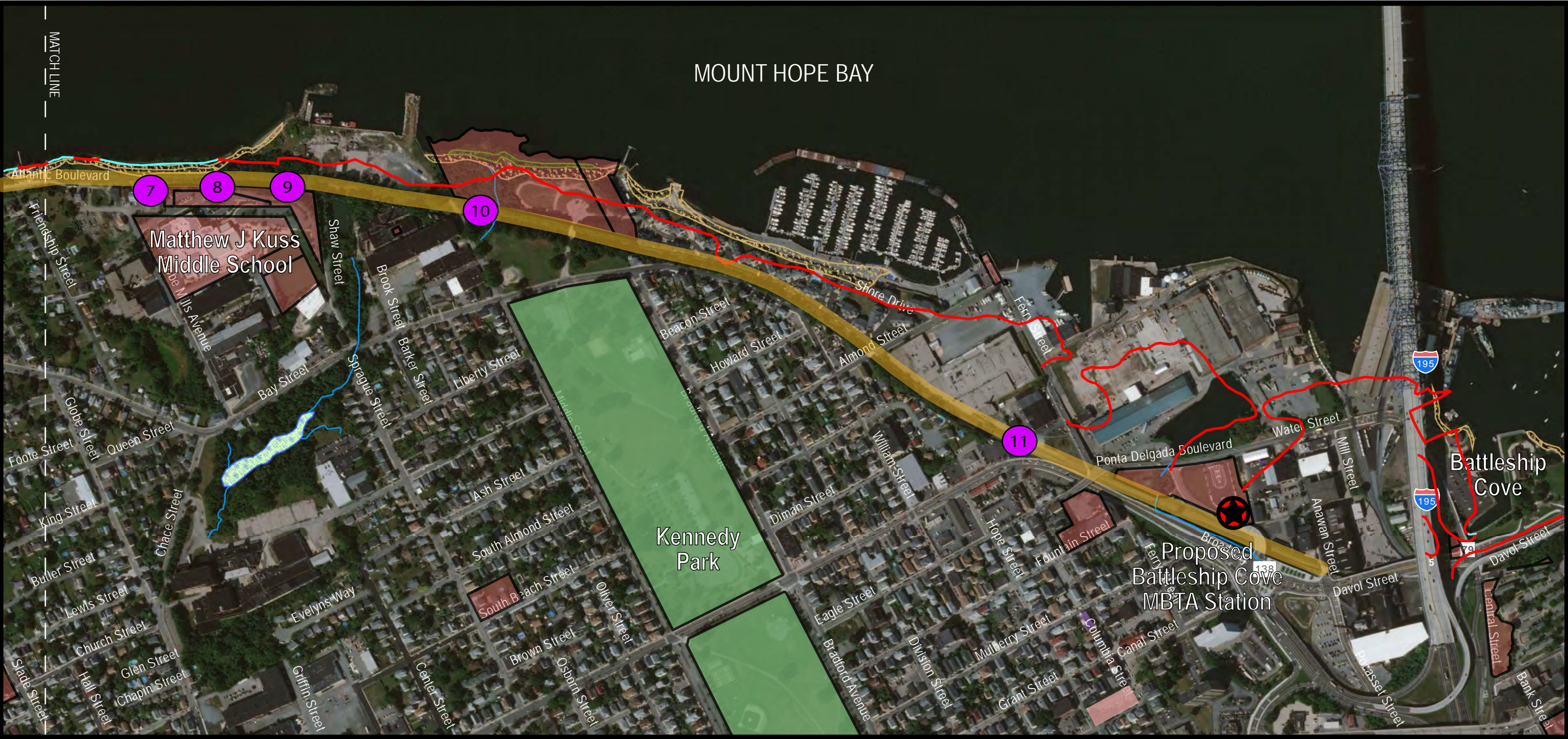










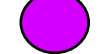
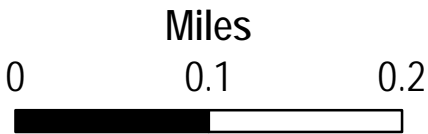


FIGURE 8: DRAINAGE ISSUES (NORTH)



Legend

- |   |   |  |
|---|---|--|
|  Wooded Marsh          |  Hydrologic Connection     |  Mount Hope Bay Greenway Corridor |
|  Salt Marsh            |  Chapter 91 Jurisdiction   |  Park                             |
|  Beach / Dune          |  Contemporary High Water   |  City Owned Parcel                |
|  Potential Vernal Pool |  Identified Drainage Issue |  |



further study should determine whether additional swale or culvert construction is necessary to reduce discharge along the trackbed. This effort should be coordinated with the Fall River Conservation Commission to determine if any existing swales are jurisdictional wetland resource areas.

### Utility Infrastructure

The Algonquin Transmission Gas Line runs within the railroad ROW from approximately State Avenue to the transmission station near Birch Street (photos below). There is also an Algonquin Gas Transmission Station located within in the ROW that will need to be relocated to create a safe, shared-use path. Additionally, overhead wires are located at portions along the study area, either within the ROW or in close proximity to the ROW.

### Landfills and Hazardous Waste Sites

The railroad lines originally served a heavy industrial area. Much of the route is within undeveloped and residential areas of Fall River, though also runs through a handful of industrial parcels along Atlantic Boulevard. The potential for encountering hazardous materials contamination during trail construction is low, except for the anticipated presence of residual contamination from railroad operations along the railroad ROW.

The MassGIS database maps currently display active regulated sites under the *Massachusetts Oil and Hazardous Material Release Prevention and Response Act* (MGL Chapter 21E) and the *Massachusetts Contingency Plan* (MCP, 310 CMR 40). Those active MassDEP Chapter 21E sites and Activity and Use Limitations (AUL) are identified on Figures 9 and 10. While

adjacent to the ROW, there do not appear to be any active sites within the ROW.

As mentioned in the conceptual cost estimates, the estimates do not include any costs associated with potential excavation and disposal of contaminated soil. A more comprehensive review of the relevant environmental issues should be considered to determine handling measures. Soil testing would be required to confirm the absence or presence of elevated levels of soil contamination. In light of this information, the project design should aim to follow the Massachusetts Department of Environmental Protection's (MassDEP) guidance for Best Management Practices for controlling Exposure to Soil During the Development of Rail Trails, which seeks to balance cut and fill volumes to minimize the need to transport materials off-site. Any excess soil that leaves the site first must be sampled for typical landfill reuse contaminants. Any encountered contaminated soils associated with the project area will require appropriate handling by implementation of a Health and Safety Plan; Monitoring, Handling, and Stockpiling of Contaminated Soils; and Disposal of Contaminated Soils under the construction contract.

### Environmental Resources

The following sections describe the existing natural and social environmental resources in the study area. This is an important step of the project development process that helps inform corridor planning and trail design. Knowing the location of particular resources will also facilitate the permitting process-es required by regulatory agencies prior to project construction.

*Algonquin Gas Transmission Valve Site, ROW behind Gold Metal Bakery on Atlantic Boulevard, and pipeline marker, follows ROW south of Valve Site (bottom)*



## Surface Water and Wetlands

The MHBG runs adjacent to Mount Hope Bay. In some areas, it is within 40 feet of the water body. Mount Hope Bay is the presumed discharge point for groundwater from the study area. The Massachusetts Surface Water Quality Standards (SWQS) designates Mount Hope Bay as a Class SB Water Body. These waters are designated as a habitat for fish, other aquatic life and wildlife, and for primary and secondary contact recreation. In approved areas, they shall be suitable for shellfish harvesting with depuration. These waters shall have consistently good aesthetic value.

Mount Hope Bay is listed as an impaired water body and does not meet its use classification for fish and wildlife habitat due to “fishes bioassessments” and does not meet its use classification for primary and secondary contact recreation due to the presence of fecal coliform bacteria.

The locations where the trail meets water and wetland resources may provide scenic viewpoints and educational opportunities. In addition to being valuable places of interest for trail users, special attention must be taken to protect these resources during trail construction and operation (Figures 11 & 12).

## Floodplain

Fall River is subject to high risk coastal flooding, particularly along the section along Atlantic Boulevard that runs closest to Mount Hope Bay. The Federal Emergency Management Agency (FEMA) identifies, assesses, and maps flood hazard and risk areas to guide development planning and insurance processes. Figures 13 and 1 illustrate where FEMA flood zones overlap with the study corridor. Special design considerations would be required for trail improvements in these zones.

## Groundwater

MassDEP regulations protect aquifers important to public groundwater supply sources. Based on the MassGIS database maps, there appear to be no MassDEP Approved Wellhead Protection Areas within the study area.

## Important Habitat Areas

A trail that encounters a variety of landscape types can provide good opportunities for wildlife viewing. This can create a unique experience for trail users, though special precautions must be taken during the design phase to protect wildlife during trail construction and from future bicycle and pedestrian traffic.

*Mount Hope Bay*



FIGURE 9: HAZARDOUS MATERIALS (SOUTH)



Legend

-  Activity/Use Limitation (AUL) Sites
-  Tier II Active Chapter 21E Classified Sites
-  Mount Hope Bay Greenway Corridor
-  Park
-  City Owned Parcel

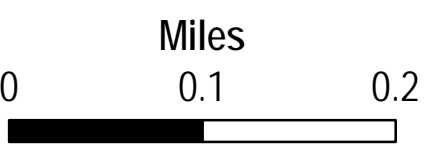







FIGURE 10: HAZARDOUS MATERIALS (NORTH)



Legend

-  Activity/Use Limitation (AUL) Sites
-  Tier 1D Active Chapter 21E Classified Sites
-  Mount Hope Bay Greenway Corridor
-  Park
-  City Owned Parcel

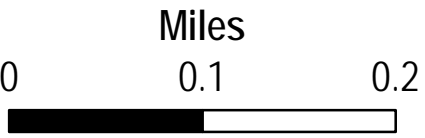



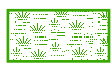


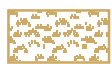





FIGURE 11: ENVIRONMENTAL RESOURCES (SOUTH)



Legend

- |   |   |  |
|---|---|--|
|  Wooded Marsh          |  Hydrologic Connection   |  Mount Hope Bay Greenway Corridor |
|  Salt Marsh            |  Chapter 91 Jurisdiction |  Park                             |
|  Beach / Dune          |  Contemporary High Water |  City Owned Parcel                |
|  Potential Vernal Pool |   |  |

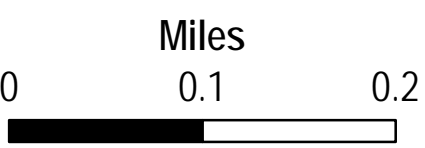












FIGURE 12: ENVIRONMENTAL RESOURCES (NORTH)



Legend

- |   |   |  |
|---|---|--|
|  Wooded Marsh          |  Hydrologic Connection   |  Mount Hope Bay Greenway Corridor |
|  Salt Marsh            |  Chapter 91 Jurisdiction |  Park                             |
|  Beach / Dune          |  Contemporary High Water |  City Owned Parcel                |
|  Potential Vernal Pool |   |  |

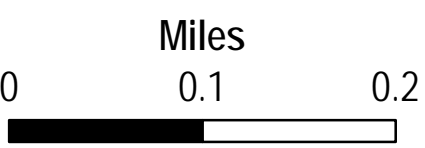








FIGURE 13: FEMA FLOODPLAIN (SOUTH)



Legend

- |   |   |
|---|---|
|  AE: 1% Annual Chance of Flooding (with BFE) |  Mount Hope Bay Greenway Corridor |
|  VE: High Risk Coastal Area                  |  Park                             |
|  X: 0.2% Annual Chance of Flooding           |  City Owned Parcel                |

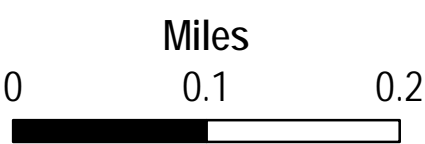








FIGURE 14: FEMA FLOODPLAIN (NORTH)



Legend

- |   |   |
|---|---|
|  AE: 1% Annual Chance of Flooding (with BFE) |  Mount Hope Bay Greenway Corridor |
|  VE: High Risk Coastal Area                  |  Park                             |
|  X: 0.2% Annual Chance of Flooding           |  City Owned Parcel                |



Two potential vernal pools were identified, but do not appear to be within the study area. These special waterbodies are extremely important to a variety of wildlife and are protected by state and federal regulations.

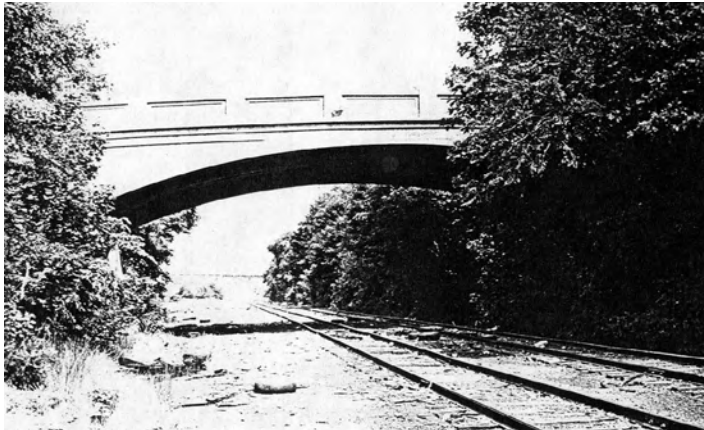
## Cultural and Historical Resources

Historical buildings and landscapes can be valuable community features along a rail-trail which help to tell the story of the town and create destination points for trail users. Fall River has a rich natural heritage worthy of recognition and pride and retains a substantial number of its historic buildings and landscapes.

The study area includes two of the five historic districts in Fall River, Downtown and Lower Highlands, both of which include the major historic and tourist attraction Battleship Cove. The City also contains three historic parks and one historic cemetery. Kennedy Park is the main open space connection of the study (Figures 15 & 16).

Upon completion of trail construction, trail users will have the opportunity to connect with several museums and open spaces near the northern terminus of Battleship Cove, including the Old Colony & Fall River Railroad Museum, Fall River Heritage State Park, and the Marine Museum at Fall River.

Fall River has rich cultural history of Portuguese, Cambodian, and Latino heritage. Its neighborhoods maintain a strong identity in these cultures and the city supports many cultural activities, including ethnic festivals, and has backed the development of artists' studios and performance spaces. The 'Gates of the City,' constructed in 2004 through a gift from Ponta Delgada, Azores, Portugal, is part of the Columbia Street cultural district and a key feature visible from the proposed on-road portion of the MHBG on Ponta Delgada Boulevard. The City has demonstrated its commitment to the value of its historic and cultural resources through efforts to inventory historic buildings and landscapes and nominate them to the National Register of Historic Places. Along the proposed MHBG, the Old Colony Braintree Highlands Railroad Bridge on Club Street is individually listed on the National Register of Historic Places.



Old Colony Braintree Highlands Railroad Bridge (left, historic photo and 2020) Ponta Delgada Boulevard (right, source: [https://www.fallriverma.org/wp-content/uploads/2017/12/Master\\_Plan\\_Entire-non\\_cover.pdf](https://www.fallriverma.org/wp-content/uploads/2017/12/Master_Plan_Entire-non_cover.pdf))

FIGURE 15: HISTORIC AND CULTURAL RESOURCES (SOUTH)



Legend

- National Register of Historic Places
- MA Historical Commission Inventory

- Mount Hope Bay Greenway Corridor
- Park
- City Owned Parcel



FIGURE 16: HISTORIC AND CULTURAL RESOURCES (NORTH)



Legend

- National Register of Historic Places
- MA Historical Commission Inventory
- National Register of Historic Places Historic District
- Mount Hope Bay Greenway Corridor
- Park
- City Owned Parcel





# CONCEPTUAL DESIGN & IMPLEMENTATION

A number of factors will influence the feasibility of the proposed MHBG. For many years, the City of Fall River has considered extending rail service south to its wastewater treatment plant and beyond into Rhode Island. This extended rail service to Rhode Island is a freight line, and it is a separate project from the South Coast Rail Project. The proposed South Coast Rail Project is anticipated to extend the Massachusetts Bay Transit Authority's (MBTA) Middleborough/Lakeville Commuter Rail Line to the northern terminus of the MHBG near Battleship Cove.

Since the extended rail service and MHBG would need to share the ROW, these two concepts are inextricably linked. While it may be possible to pursue both projects, the City should decide whether or not they want to extend rail service before progressing the MHBG.

As previously mentioned, developing the MHBG as a standalone rail-trail project would be a more straightforward project. While it might be possible to extend rail service and complete the MHBG, developing these two projects in conjunction with one another would significantly increase the timeline, complexity, and cost of each project.

Since the City has not yet made a decision to pursue the extended rail service or not, this report provides information on both rail-trail and rail-with-trail designs and project implementation.

## Rail-With-Trail or Rail To Trail

Whether or not an active rail line will be extended beyond Battleship Cove will have a significant impact on the MHBG. If rail service is proposed along the Greenway, the City of Fall River should anticipate that a minimum 25-foot clearance offset between the rail line and the greenway trail will be required by the agency to ensure user safety. In exceptional cases, a narrower offset may be permitted. There are areas along the preferred route of the MHBG that would require that the 25-foot clearance offset be reduced to accommodate a rail-with-trail design. A rail feasibility study should be conducted to inform recommendations for this planning effort as the type of rail service proposed would likely change rail-with-trail engineering requirements.

The City of Fall River should make a determination of whether rail service is feasible before further work occurs on the MHBG. It is likely that without this determination, any work conducted on the MHBG would need to be completely redone if rail service is advanced. Due to the additional land requirements, rail-with-trails projects are far more complicated than rail-trail projects, so if rail service is determined to be infeasible, the MHBG project could be simplified and more easily completed as a recreational rail-trail. While construction of the MHBG could occur prior to rail service being established, this would likely require the greenway to be reconstructed as rail service is established.

Rail-with-trails projects are similar to standalone shared-use paths, but have significantly more requirements related to ensuring the safety of both trail users and train operations.

A rail-trail project is more feasible along the entire corridor, but there is opportunity to develop a rail-with-trail project along portions of this ROW that aren't as constrained. The design requirements and facilities required will vary between the two options. A standalone rail-trail would be similar to a typical shared-use path or trail. A shared-use path is a facility for non-motorized uses that meets accessibility requirements and is independently aligned and can be used for a variety of purposes including recreation, commuting, and local travel.

It is anticipated that design, permitting, and construction funding for the MHBG would be sought from municipal sources, a variety of grant programs, and other public (federal, state, and local) sources. The Fall River Bicycle Committee has remained a frequent recipient of Community Preservation Act funding and the City will likely pursue state/federal project funding through the Massachusetts Department of Transportation (MassDOT).

## Trail Design Elements

This section addresses the following conceptual trail design elements:

- Design Criteria
- Trail Type
- Typical Trail Cross Section
- Trail Surface Material

- At-Grade Trail/Roadway Crossing Treatment

## Design Criteria

The design criteria for the options listed below are based on standard engineering practice and the successful application of regulatory standards and guidelines. The primary references for the project criteria include:

- The Americans with Disabilities Act Accessibility Guidelines (ADAAG)
- The MassDOT Project Development & Design Guide
- AASHTO Guide for the Planning, Design and Operation of Pedestrian Facilities
- AASHTO Guide for the Development of Bicycle Facilities
- The Rules & Regulations of the Massachusetts Architectural Access Board (521 CMR)
- The Manual on Uniform Traffic Control Devices (MUTCD)

## Trail Type

The proposed project will consist of the following trail types of shared-use path and on-road facilities:

- Rail-Trail (Rail to Trail Conversion)
- Rail-With-Trail
- Bicycle Route or Shared Roadway

### Rail-Trail or Rail to Trail Conversion

This option would consist of replacing the railway tracks with a shared-use path. This type of facility is attractive to all ages and skill levels because it provides separation from automobile traffic. In addition to bicycling, shared-use paths are used extensively for walking, running, and in-line skating. As it is a shared-use facility, stringent pedestrian accessibility requirements govern. Where these requirements cannot be

met, a variance must be requested from the Massachusetts Architectural Access Board (AAB).

Implementation of a rail-trail option does not necessarily preclude the re-introduction of rail traffic to the ROW in the future, however, it is very likely that implementing this design now would require the trail to be redesigned if rail traffic were to be introduced in the future. See Figure 18 for a typical cross section of a rail-trail configuration.

### Key Design Criteria

- 10' surface width (typical) / 8' surface width in environmentally sensitive areas (minimum)
- 2-foot shoulders (each side)
  - » The shoulder is typically graded to a 1' vertical to 12' horizontal (1:12) slope to enhance proper drainage to prevent erosion and provide a recovery zone for trail

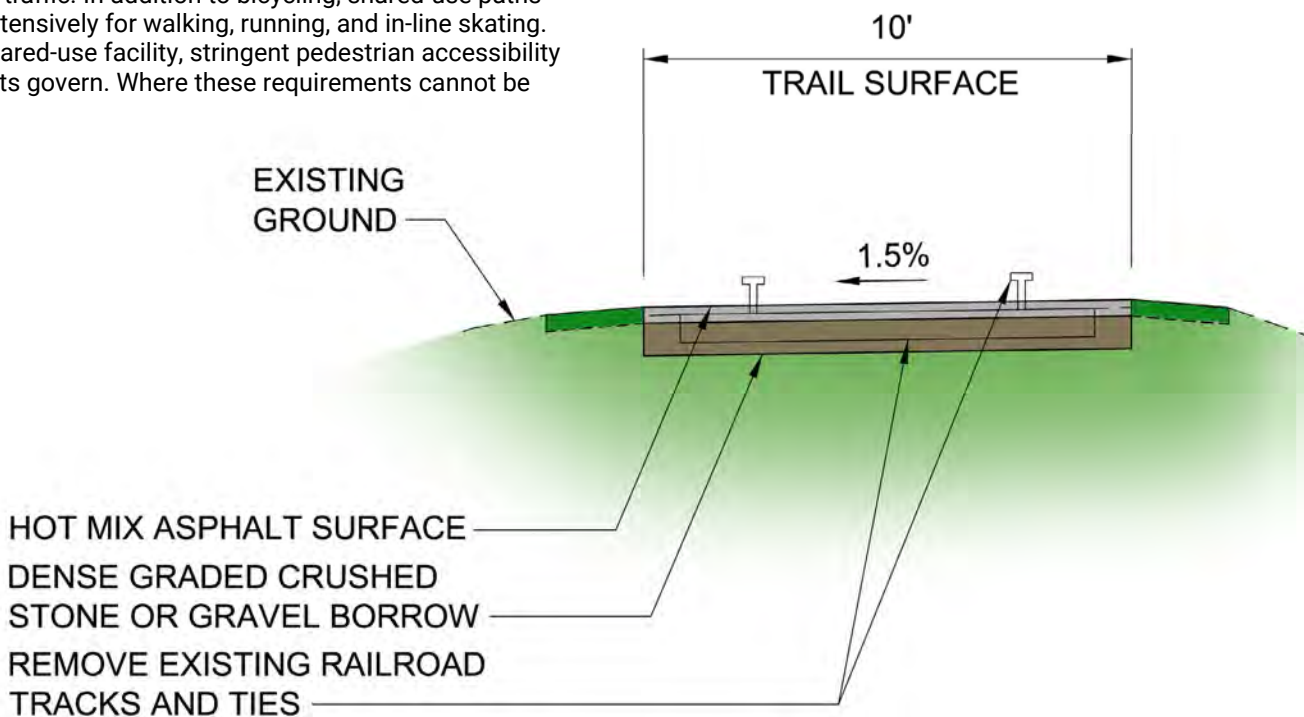
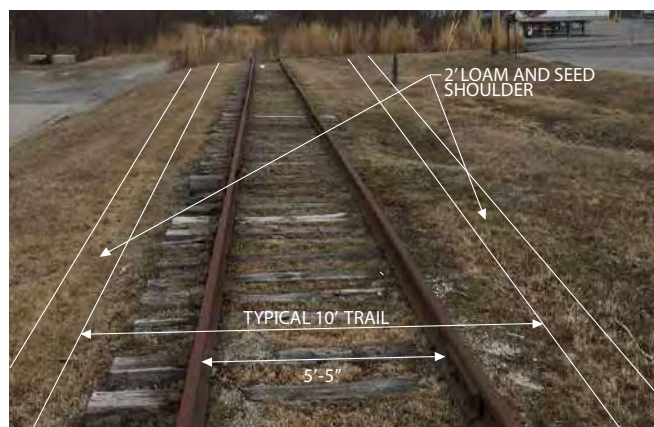
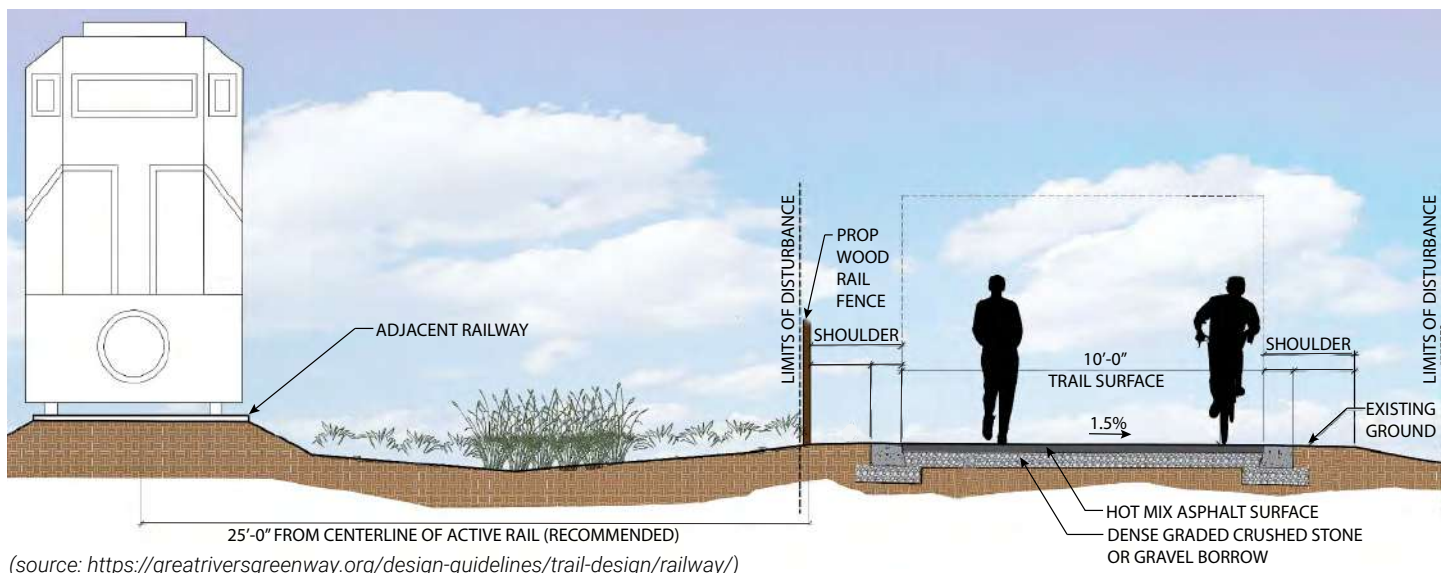


FIGURE 17: CONCEPTUAL MOUNT HOPE BAY RAIL-TRAIL SECTION (TOP RIGHT)

FIGURE 18: TYPICAL RAIL-TRAIL SECTION

FIGURE 19: CONCEPTUAL MOUNT HOPE BAY RAIL-WITH-TRAIL SECTION (BOTTOM LEFT)  
FIGURE 20: TYPICAL RAIL-WITH-TRAIL SECTION



users. Shoulder areas should be compacted, stabilized, and designed to discourage their use as informal tread ways.

- 2' minimum (3' ideal) clear offset from edge of trail to obstructions (i.e. tree, fence, sign, wall)
- 5' to 7' minimum separation from roadway or steep slopes
  - » If this offset cannot be achieved, then a physical barrier such as a wood rail fence or dense shrubbery should be installed along the top of slope to protect trail users. In general, the greater the height of the drop-off, the greater the need for protection.
- 4.5% maximum running slope or grade (construction tolerance +/- 0.5%)
- 1.5% maximum horizontal cross slope (construction tolerance +/- 0.5%)
  - » The trail will need to be raised slightly above the surrounding ground and have a 1.5% cross slope in one direction to ensure stormwater drains off the trail surface. The direction of the cross slope should be established based on the natural drainage patterns at the site. A 1.5% cross slope (construction tolerance +/- 0.5%) is the same as a typical sidewalk and meets Americans with Disabilities Act (ADA) accessibility guidelines.

### Rail-With-Trail

Portions of the alignment could be implemented as a rail-with-trail to provide both recreational non-motorized access and support freight or passenger train service south from Battleship Cove to the wastewater treatment plant and/or Rhode Island. However, there are several regions of corridor where it may not be possible to construct a rail-with-trail. Therefore, a rail feasibility study is necessary to



determine where ROW and/or topography limits a rail-with-trail design. This facility is a type of shared-use path that is constructed alongside active rail. The rail-with-trail concept provides even more opportunities for the creation of trail systems that enhance local transportation systems, offering safe and attractive community connections. Rail-with-trails can also provide a solution for rail companies and local governments concerned about safety risks posed by those who illegally cross rail lines. By providing a safe, attractive alternative for cyclists and pedestrians, often with fencing between the pathway and the railway, rail-with-trails can eliminate the previous incentive for pedestrians and cyclists to use the tracks as a shortcut. This option would extend from the proposed Mount Hope Bay's southern terminus to Kennedy Park.

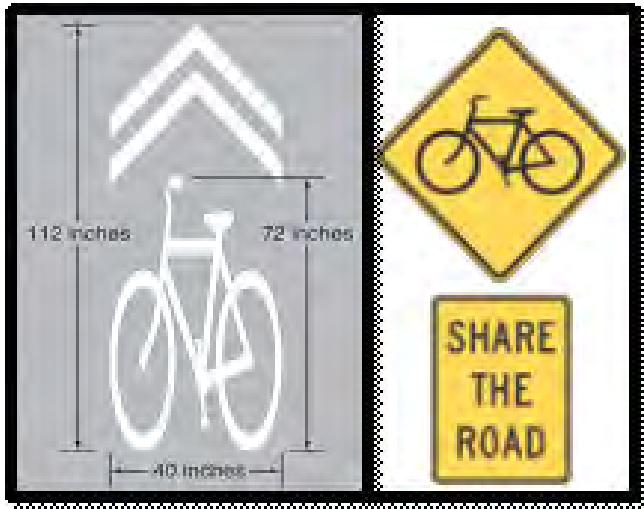
Rail-with-trails offer the same health, transportation, and environmental benefits as traditional rail-trails. Rails-with-trails

enhance local transportation networks by providing non-motorized connections that are sometimes preferable to on-road bike lanes or sidewalks located on congested, busy roadways. Rail-with-trails benefit railroads, too. In most cases, the trail manager purchases an activity use easement or license from the railroad, providing financial compensation and in some cases reducing liability responsibility and cost to the railroad. In some instances, a fully developed trail will also provide the railroad with improved access for maintenance vehicles.

See Figure 20 for a typical cross section of a rail-with-trail configuration.

### Key Design Criteria

- 10' surface width (typical)
- 8' surface width in environmentally sensitive areas (minimum)
- 2' shoulders (each side)
  - » The shoulder is typically graded to a 1' vertical to 12' horizontal (1:12) slope to enhance proper drainage to prevent erosion and provide a recovery zone for trail users. Shoulder areas should be compacted, stabilized, and designed to discourage their use as informal tread ways.
- 72" fence separating trail from track and any railroad appliances
- 25' clearance offset from centerline of tracks to fence (in exceptional situations, MBTA has allowed a narrower offset)



Example Pavement Markings and Signage for On-Road Segments

- 2' minimum (3' ideal) clear offset from edge of trail to obstructions (i.e. tree, fence, sign, wall)

## On-Road Bicycle Facilities

For portions of the MHBG that follow or connect to existing city streets, there are a variety of treatments that can improve bicycle and pedestrian access. These include:

### Separated Bicycle Lanes

A separated bike lane is an exclusive space for bicyclists along or within a roadway that is physically separated from motor vehicles and pedestrians by vertical and horizontal elements. Designers have flexibility in determining the type of separation, whether it be with flat or raised buffers.

### Key Design Criteria:

- Separated Bike Lanes at least 4' wide (for one-way separated bike lanes)
- 2' Street Buffer (minimum)
- Grades less than 5% are desirable
- Maximum grades can range from 5% to 11% for lengths of 800' to 50', respectively

### Bicycle Routes or Shared Roadways

A bicycle route refers to use of normal roadway travel lanes by both motor vehicles and bicyclists. These facilities are also referred to as shared lanes or a shared roadway. "Share the Road" warning signs or "Bike Route" directional signage is typically installed along these facility segments (see image at left). In addition, shared lane markings or "sharrows" can also be provided to identify the route and to indicate how far from the roadway edge bicyclists should ride. A detail of a shared lane marking is shown at left. Similar to bicycle lanes, this type of facility is also used mostly by bicyclists that are experienced in sharing roadways with motor vehicle traffic. They do not attract the variety of users and skill levels that a separated shared-use path normally attracts. Bicyclists traveling along these local roadways follow the same rules of the road as vehicles.

### Key Design Criteria:

- Travel lanes at least 14' to 15' wide (preferred)
- Recommended for roadways with low speeds and low to moderate traffic volumes
- Grades less than 5% are desirable
- Maximum grades can range from 5% to 11% for lengths of 800' to 50', respectively

As the design of the MHBG is advanced and on-road connections are finalized, the design team will be able to identify which of these treatments are suitable. These decisions will be made based on vehicle volume, roadway width, and other factors. It is likely that separated facilities may be feasible in some locations, but not possible in others.

## Trail Surface Material

### Trail Sub-Base

For either a rail-trail or rail-with-trail design, the existing sub-base material, including the railroad ballast (stone), will be graded to fill any voids then compacted and rolled. The next step is to install the base and top course materials, rolling and compacting between layers. Any wet or organic sub-base material should be removed to prevent uneven settlement of the base and top courses. Depending upon existing conditions, this may require installing additional depth of base course material to replace any unsuitable materials encountered during construction. The only way to confirm the suitability of the sub-base material prior to the start of construction would be to conduct a geotechnical sampling program.



Trail Construction  
(Topsfield Common)

### Trail Surface Design Requirements

According to the *Accessibility Guidelines for Pedestrian Facilities in the Public Right-of-Way; Shared-use Paths* issued by the Architectural and Transportation Barriers Compliance Board (Access Board), a trail surface must be firm, stable, and slip resistant to meet current ADA guidelines. Per the Access Board definitions "a stable surface remains unchanged by applied force so that when the force is removed, the surface returns to its original condition. A firm surface resists deformation by indentations." Based on this definition, a soft surface trail will not fully meet current ADA guidelines under all conditions. A soft surface trail is flexible when dry. When it becomes wet, the entire surface softens and is susceptible to deformation (i.e. rutting). The trail would need to be constructed with a stabilized granular surface or hot mix asphalt (pavement) to meet current ADA guidelines under all weather conditions. The following surface materials are commonly used in trail construction:

### Types of Trail Surfaces

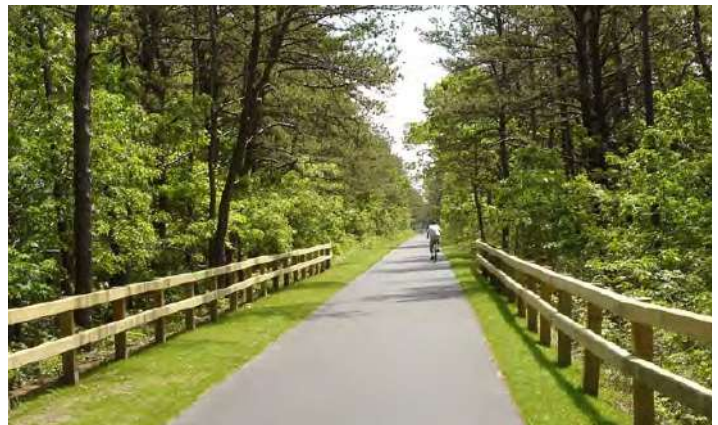
#### Paved Surface

Pavement or hot mix asphalt is the most commonly used trail surface. A paved surface is the same surface material used on roadways and other rail-trails such as the Alfred J. Lima

Quequechan River Rail Trail and Cape Cod Rail Trail. Asphalt is a durable material which, when properly constructed, requires minimal maintenance and has a long service life. For example, the Cape Cod Trail was recently resurfaced after more than 25 years of use. Surface and crack sealing can further extend service life. By its nature, asphalt meets ADA requirements for firmness, stability and skid resistance. Asphalt accommodates the widest variety of users and is suitable for all levels and abilities. The photo below shows an example of a paved trail surface. Paved surfaces are preferred wherever possible and are considered best practice in shared-use trail design.

The Fall River Bicycle Committee have indicated that their preference is to construct a paved surface trail along shared-use trail portions and a soft surface along any environmentally constrained portions of the corridor. These recommendations are used for the conceptual cost estimates included in this Study.

Paved Trail Surface  
(Cape Cod Rail Trail)



#### Stabilized Granular Surface

In very sensitive environmental areas or other small areas, stabilized granular surface may be utilized. A stabilized granular surface consists of a natural stone dust surface combined with a stabilizing agent. Stabilizing agents can be in the form of a spray application or a material admixture. This agent, when added or applied to native soils, granite or crushed aggregate screenings, binds the aggregate to provide



Stabilized Granular Trail Surface  
(Lizzy's Trail, DCR Bradley Palmer State Park)

a firm natural surface that meets ADA guidelines (but is not as accessible as paved trails). As the water evaporates from the mixture, the surface becomes hard and will resemble an asphalt surface. When dry, a stabilized granular surface is firm and when it becomes wet, the top ¼" of the surface softens. Stabilized granular surfaces can provide increased durability and erosion resistance over conventional granular surfaces. Stabilized granular surfaces require costly annual maintenance. Repairs can be accomplished with a small mixer. The color, texture and appearance of the finished surface depend on the selected aggregate (e.g. tan, gray, red). There are many different products available including, for example, Stabilizer Solutions, PolyPavement, DirtGlue and Road Oyl. The Minuteman National Park Battle Road Trail and Massachusetts Department of Conservation and Recreation's (DCR) Charles River Reservation trails were constructed using a stabilized granular surface. The photo shows an example of a stabilized granular trail surface.

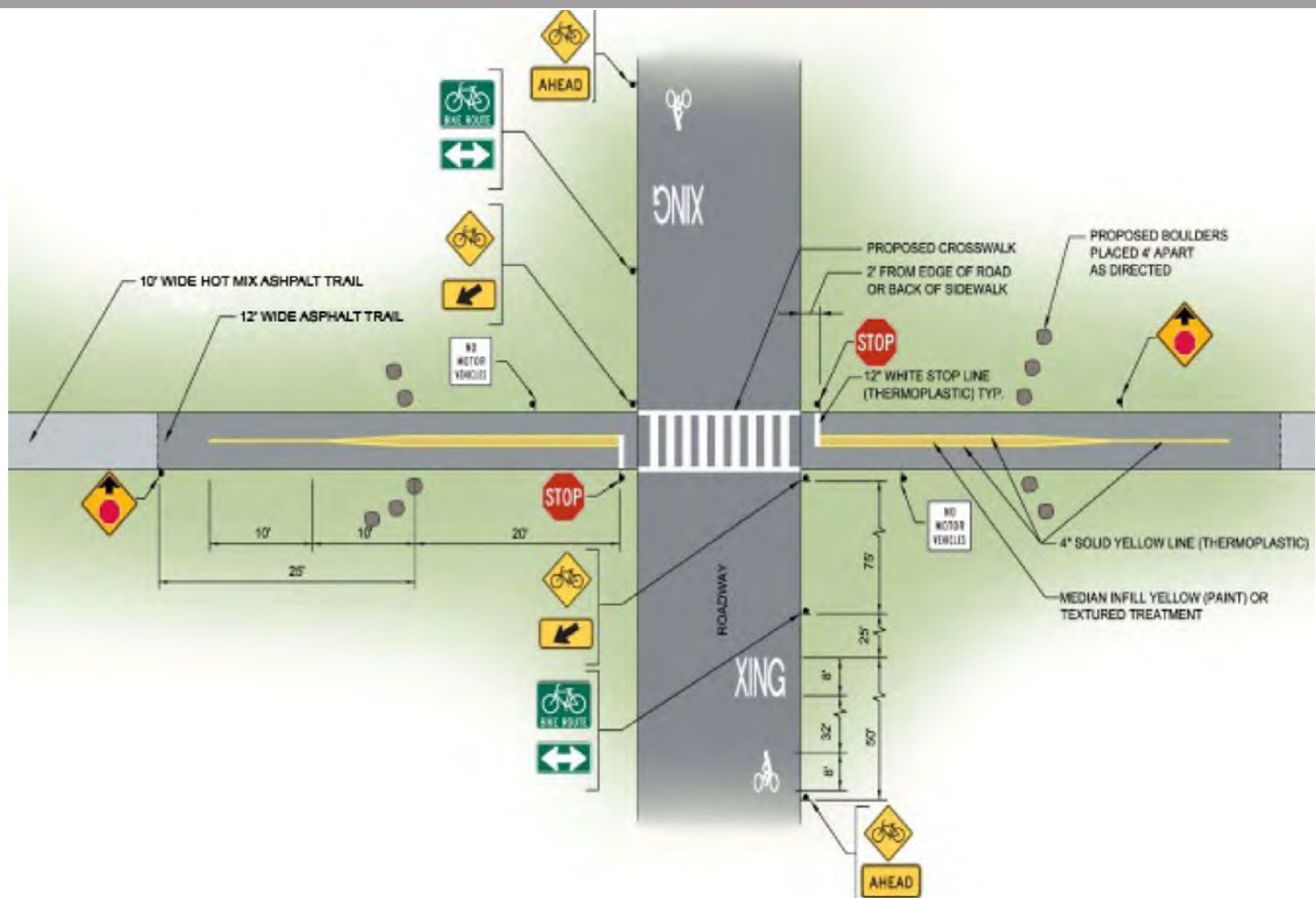
## At-Grade Trail/Roadway Crossing Treatment

The former rail corridor crosses several local roadways at-grade. At each trail approach, the following safety improvements are recommended:

- Construct trail median treatment of a split entry into two sections separated by low landscaping or a curbed median.
- Install signs along the trail to warn trail users of the approaching intersection
- Install signs and pavement markings along the roadway to warn motorists of the approaching trail crossing.
- Install "ladder" crosswalk consisting of two parallel horizontal white lines with spaced white vertical bars to improve crosswalk visibility by motorists.
- Mount street name signs above stop signs at each crossing for user orientation.

For the benefit of vision-impaired trail users, the City should also consider installing detectable warning surfaces (tactile warning strips) at each crossing. Detectable warning surfaces consist of small, truncated domes that are integrated into a walking surface and are detectable underfoot. This surface panel extends at least 2 feet in the direction of pedestrian travel and the full width of the shared-use path. The recommended intersection treatment is shown in Figure 21.

FIGURE 21: TYPICAL AT-GRADE TRAIL CROSSING LAYOUT



## Conceptual Trail Design

As part of the Study effort, approximately 3 miles of former rail corridor were evaluated to determine which sections were achievable for development of a shared-use rail-trail or rail-with-trail. The conceptual design has been organized into several routes. Each lead to the proposed Greenway's northern terminus at Battleship Cove (Figures 22 and 23). However, the proposed Battleship Cove MBTA Station (Southcoast Rail Phase 1) will be south of Battleship Cove and will be utilizing the same ROW as the proposed MHBG. In this area of the ROW, there is not sufficient width to have a rail-with-trail design, so the northernmost portion of the MHBG will be an on road connection to Battleship Cove and Fall River Heritage State Park. Depending on the City's decision to pursue extending rail service beyond the new Battleship Cove MBTA Station or not, the MHBG could continue along the railroad ROW to the MBTA station using a rail-trail or rail-with-trail design where space permits or transition to an on road alignment. Each segment will be examined further by the design team when selecting a final route. These options are discussed in more detail in the following sections.

### Segment 1

In order to connect with the Tiverton portion of the MHBG, the City could explore three potential routes (Figure 22, Page 34).

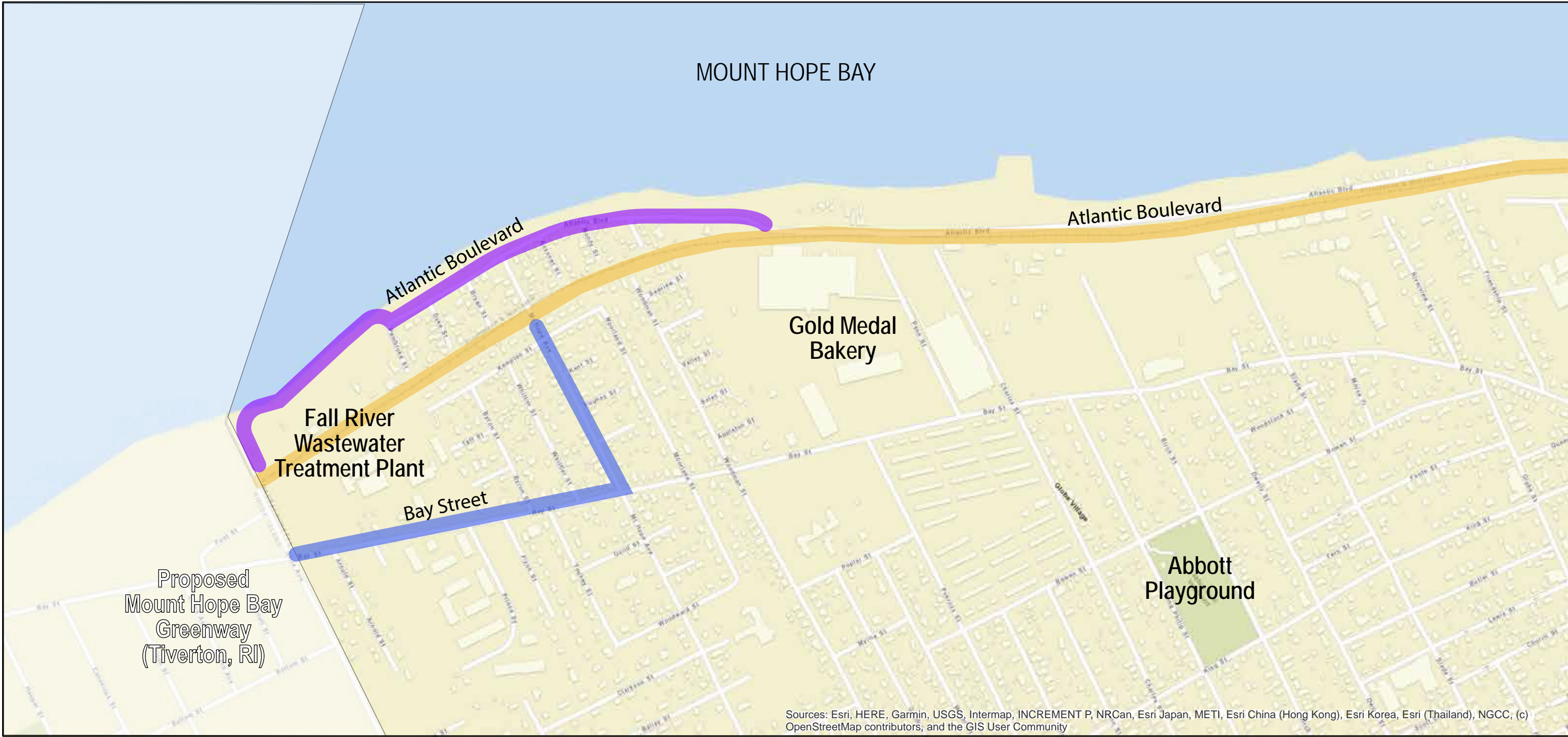
*Almond Street Bridge*



*Railroad Corridor between Mount Hope Avenue and Penn Street (top left)  
State Avenue Bridge to wastewater treatment plant (bottom left)  
Overgrown Rail Crossing Signal at Mount Hope Avenue (right)*



FIGURE 22: MOUNT HOPE BAY GREENWAY PROPOSED SEGMENTS (SOUTH)



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Legend

- Segment 1A (Rhode Island State Line to Kennedy Park): Follows Rail Corridor
- Segment 1B (Rhode Island State Line to Kennedy Park): Follows Atlantic Boulevard
- Segment 1C (Rhode Island State Line to Kennedy Park): Travels On-Road via Bay Street



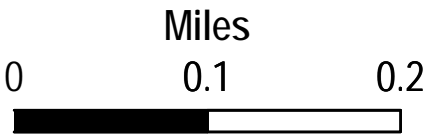
FIGURE 23: MOUNT HOPE BAY GREENWAY PROPOSED SEGMENTS (NORTH)



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Legend

- Segment 1A (Rhode Island State Line to Kennedy Park): Follows Rail Corridor
- Segment 2 (Middle Street to Bay Street, includes spur at Kennedy Park)
- Segment 3 (Continued Along Railroad ROW, from Segment 1)
- Segment 4 (Continued Along Railroad ROW, from Segment 3)
- Segment 5 (Almond Street to Ponta Delgada Boulevard, from Segment 2 or 3)



Segment 1A extends from State Avenue at the Tiverton, RI line to Kennedy Park, a distance of approximately 1.8 miles. The majority of the segment follows the railroad corridor and runs along Atlantic Boulevard. This segment offers the best opportunity to provide a rail-with-trail design as it is owned by the same owners as the rest of the corridor and is a direct connection to Kennedy Park. Should the City choose not to select the alignment that follows the ROW through the Wastewater Treatment Plant, Segments 1B and 1C offer two alternatives. Segment 1B follows Atlantic Boulevard and then the Mount Hope Bay Shoreline at the Wastewater Treatment Plant. A boardwalk would significantly increase the per-mile construction costs and may present environmental permitting challenges. Segment 1C travels on-road via Bay Street. This segment avoids the Wastewater Treatment Plant entirely, but would require traffic studies and private partnerships with adjacent landowners to fit the trail safely along the roadway.

Once back on the rail corridor, there are several sections along

Segment 1A where there may not be suitable space within the ROW to accommodate a rail-with-trail. Due to the proximity to the rail, encroachments, issues with slope stabilization along embankments, and utility adjustments, it may not be feasible to construct a rail-with-trail design through this whole section. If further study shows that a rail-with-trail design is not feasible, a traditional rail-trail design is recommended. In these heavily constrained areas, it is recommended that a traditional rail-trail design is used.

This segment includes the following proposed features and opportunities:

*Location of proposed "Aroma Overlook" at Gold Metal Bakery, Atlantic Boulevard and Penn Street (top left)*

*Location of proposed scenic overlook at Matthew J. Kuss Middle School (top right)*

*Algonquin Gas Transmission Valve Site, ROW behind Gold Metal Bakery on Atlantic Boulevard, and pipeline marker, follows ROW south of Valve Site (bottom)*



- Demolition of bridge at State Avenue to provide necessary clearance for wastewater treatment plant vehicles (bottom left photo on page 13). Potential alternatives include the reconstruction of this bridge that provides greater clearance or design the trail to meet State Avenue at-grade.
- Proposed Scenic Overlook at Matthew J. Kuss Middle School.
- “Aroma Overlook” stop near the Gold Medal Bakery (top left photo on previous page). Ideas for this location include an informational kiosk depicting the history of the Gold Medal Bakery and highlighting various components of Portuguese and other cultural history integral to Fall River’s identity.

This segment presents the following challenges:

- Algonquin Gas Line: the City would be responsible for engaging in an agreement with Algonquin Gas to utilize the corridor for recreational trail use.
- The slopes and encroachments on either side of the ROW may increase the cost of a rail-with-trail design significantly due to increased “cut” sections necessary to provide enough space for the trail. Alternatively, the trail could be raised above grade of the existing tracks as a way to limit “cutting.”

At Kennedy Park, the MHBG could follow one (or more) of several routes to Battleship Cove / Fall River Heritage State Park (Figure 23, Page 35).

## Segment 2

Segment 2 is an optional on-road connection to Kennedy Park and the surrounding neighborhoods. This option would begin at the northern end of Segment 1 at Kennedy Park and travel on-road along Middle Street to Bay Street and follow Bay Street until it becomes William Street and make a left onto Almond Street and connecting to Segment 4 and/or 5. This segment includes a spur at Club Street that connects trail users to the scenic waterfront portion of Kennedy Park and would provide direct access to the MHBG from The Landing at South Park condominium community. This route stretches a distance of approximately 0.5 miles and is proposed to be entirely on-road. Design considerations will need to evaluate the roadway width to incorporate a separated bike lane, improved sidewalks, and MHBG directional signage. On-road routes should incorporate “Share the Road” warning signs or “Bike Route” directional signage in addition to pavement markings and shared lane markings/“sharrows.”

This segment includes the following proposed features and opportunities:

- Avoids limited ROW under Almond Street Bridge.
- Connects trail users to surrounding neighborhoods.

This segment presents the following challenges:

- The on-road segment would require further traffic study.
- This section of Bay Street is narrow and would provide trail users with a limited sight distance.
- Construction of this segment would potentially require public parking to be eliminated.

## Segment 3

Segment 3 would continue along the railroad corridor at the northern end of Segment 1 and extends approximately 0.4 miles. A rail-with-trail design is preferred here, however this segment may present similar dimensional challenges as mentioned in Segment 1. There are also grade changes in this area that may make connecting to adjacent neighborhoods challenging. A lack of neighborhood connections could decrease users’ perception of safety and impact usage of the greenway. In this segment, there also may be opportunities for private property owners to partner with the City to bring the MHBG closer to the waters edge. If so, additional trail alignments could be explored. Depending on how it is engineered, Segment 3 also has the possibility to connect with Bay Street and continue on-road and/or continue along the railroad ROW to connect with Segment 4 and/or 5.

This segment includes the following proposed features and opportunities:

- This section would continue along the rail corridor unconstrained.
- Construction of this segment has potential to connect on-road to Bay Street if needed.

*Entrance to Kennedy Park Waterfront Area*



*Railroad Corridor Looking North at the Almond Street Bridge*



This segment presents the following challenges:

- Limited neighborhood connections due to grade separation along the corridor.
- The available ROW is limited along portions of this segment.

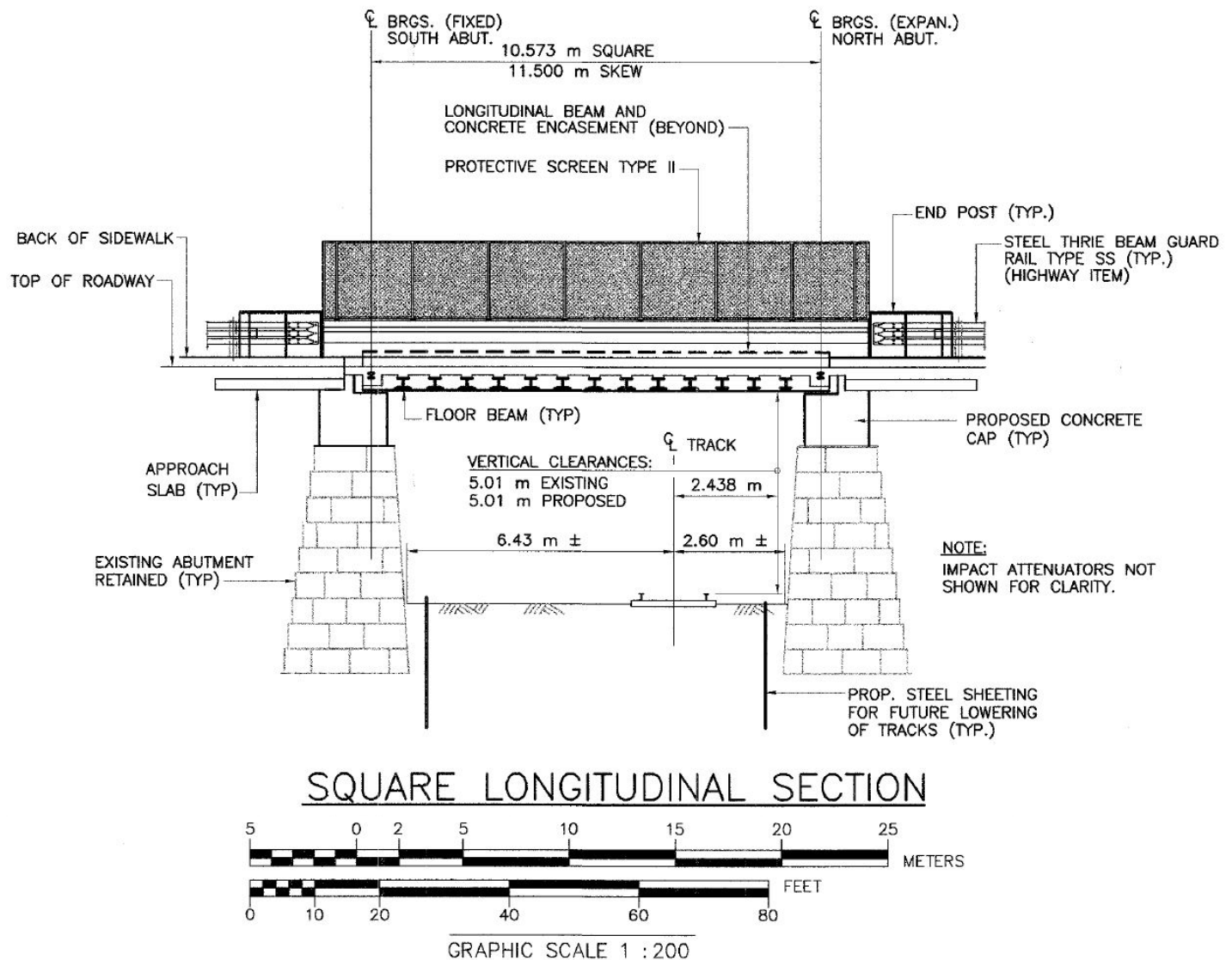
#### Segment 4

Segment 4 continues along the railroad corridor to the proposed Battleship Cove MBTA Station and is approximately 0.75 miles long. This segment passes under the Almond Street Bridge. A rail-with-trail design would only be possible at this location if the MBTA and future railroad operator agree to reduce the typical 25-foot offset between the track's centerline and trail fencing. While the MBTA has allowed reductions in this offset in exceptional situations, it is handled on a

Railroad Corridor Passing Under the Almond Street Overpass



FIGURE 24: ALMOND STREET BRIDGE CROSS SECTION PLAN



case-by-case basis, and reductions are not commonly granted. All aspects of the corridor and rail usage will need to be reviewed. If a rail-with-trail design cannot be accommodated under the Almond Street Bridge, it may be possible to create an on-road connection between the trail in the ROW and Bay Street just south of the Almond Street Bridge. An additional consideration is that if this route is pursued, one of the tracks that splits off at the Topsy Toboggan Restaurant would have to be removed to provide the necessary clearance for a rail-with-trail. If the space does not permit a rail-with-trail design, a traditional rail-trail could be used. Since the proposed Battleship Cove MBTA Station is south of Battleship Cove and Fall River Heritage State Park, the MHBG will not be able to connect directly via the railroad ROW to its northern terminus at the park. If Segment 4 is pursued, the MHBG will need to transition to an on-road alignment at the new MBTA station. If possible, this transition could be incorporated into the station design to allow for easy access to Ponta Delgada Boulevard/ Water Street and Battleship Cove/the Fall River Heritage State Park.

This segment includes the following proposed features and opportunities:

- This section would continue along the rail corridor unconstrained and would avoid traveling on-road.

This segment presents the following challenges:

- At least one, if not both, tracks would need to be removed to provide space for the trail.
- Available space under the Almond Street Bridge is not sufficient for a rail-with-trail design.

## Segment 5

Segment 5 is an alternative to Segment 4 and extends from the intersection of Almond Street and Shore Drive, connecting with Segments 2 and/or 3 and stretches for approximately 0.75 miles to Battleship Cove and Fall River Heritage State Park via Almond Street, Ferry Street, Ponta Delgada Boulevard, and Water Street. This route would be entirely on-road and would be employed if the necessary clearance under the Almond Street Bridge is not available. This route would need to incorporate the same design considerations identified for Segment 2. This area is predominantly industrial, so requirements to provide safe pedestrian and cyclist access where truck traffic is present would need to be incorporated. These requirements include increased signage, visibility markings, and warnings to both nonmotorized and vehicle traffic.

This segment includes the following proposed features and opportunities:

- Provides direct access for employees of surrounding businesses.
- Provides a direct connection to Battleship Cove.

This segment presents the following challenges:

- Alignment along this segment would potentially conflict with industrial vehicles and activities in the surrounding area.
- Would be difficult to construct trail up to grade on Ponta Delgada Boulevard.

*Railroad ROW parallel to the Western Fall River Expressway*



*Mount Hope Bay Greenway Northern Terminus at Battleship Cove*

## Conclusion

To determine the overall feasibility of the MHBG, it is critical to evaluate which sections successfully meet the project goals and are consistent with the community needs. Design and construction costs, discussed in the next section, are also a factor. As mentioned previously, the City's decision about pursuing extending rail service beyond the proposed Battleship Cove MBTA Station will greatly impact the next steps in the design of the MHBG. Some segments of the Greenway could be constructed prior to a decision about extended rail service but would likely need to be reconstructed if the railroad is extended. The ability to implement the various sections of this project will require commitment from key project partners as well as securing the various necessary design and construction funding.

Based on a review of existing conditions, future development plans, and infrastructure improvement projects along and adjacent to the former rail corridor, developing the entire 3 miles of former railroad corridor as a rail-with-trail may not be feasible without substantial financial investment. However, there are opportunities to develop the corridor utilizing the types of facilities discussed in the **Trail Type** section of this report. Each type of greenway would attract a variety of users and provide the desired recreational amenity.

## Project Development Costs

A preliminary construction cost estimate was developed for each major project component based on the conceptual design presented in this study. The conceptual project development costs also include the design costs for specific project elements, such as the proposed overlook at Matthew J. Kuss Middle School, the removal of the bridge along State Avenue, and ongoing trail operation and maintenance costs. The overall cost will largely depend on the City's decision to maintain the rail for future use, or to remove the rail tracks and ties in certain areas.

## Property Agreements

In order to pursue plans to convert the former rail corridor to a trail, the City will need to perform property research and negotiate agreements with various public and private entities. The cost to perform this reconnaissance effort and the cost to acquire the necessary property rights should be included in the project development cost estimate but are not included in the conceptual construction cost estimate provided in this study.

Given the cost of shared-use trail construction, most municipalities seek to obtain a permanent easement or deed transfer of property. These forms of property agreements run with the land and are recorded with the Registry of Deeds. The written agreement language needs to be accompanied by a plan prepared by a Professional Land Surveyor (PLS). Temporary easements may also be needed for access during construction. Temporary easements are limited to a specific period of time and automatically extinguish at the end of the period. Unless a property owner donates the land to the City, there will be a cost associated with the land transfer. The City will need to have an appraisal performed to determine a fair value on which to base negotiations.

To keep project development costs down, municipalities often seek land donations from property owners along the corridor. Property owners have the right to forgo negotiations and donate their property or a portion of their land to the city or town for development of the proposed project. The donation of land for conservation or recreational purposes may be eligible for a tax credit through the Commonwealth of Massachusetts Executive Office of Energy & Environmental Affairs (EOEEA). The program involves an application process and the land must meet the selection criteria for the owner to be eligible for the tax credit.

Prior to acquiring any land interests, the City should hire an attorney to undertake a title review of each parcel on which a permanent easement or deed transfer is proposed. Performing a title review of a former rail corridor requires extensive research dating back to when the railroad originally acquired the ROW and then tracing the land transfers forward to the current time.

Leases or licenses for use of a property generally have shorter terms and are not considered an interest in real property. These forms of property agreements may be appropriate for informal greenway trails where there is not a significant level of investment required for trail construction. With a lease or license, the cost to the City will be based on the duration of the agreement (i.e. 1 year, 5 years, etc.).

The terms of each property agreement will need to allow for the design, construction, and maintenance of the trail.

## Construction Cost Estimate

The unit costs associated with the major items of work are listed in Table 1. The estimated construction costs by segment are listed in Table 2. The estimated construction costs include material and installation costs and assume that the project will be publicly bid and constructed by an independent contractor. A potential means to reduce construction costs would be for the City to perform certain activities, such as trail clearing, instead of including it in the construction contract. This work could be performed entirely by the City's Department of Public Works.

In providing estimates of probable cost, it is recognized that neither the City of Fall River nor Stantec have control over the costs of labor, equipment or materials, or over the Contractor's methods of determining process or bidding. The opinion of probable costs is based on Stantec's reasonable professional judgment and experience and does not constitute a warranty, express or implied, that the Contractor's bids or the negotiated price of the Work will not vary from the Client's budget or from any opinion of probable cost prepared by Stantec.

A 30% contingency has been applied to the estimated cost per segment in Table 2 to account for details yet to be determined. These details include, for example, landscaping, other site amenities (retaining walls, environmental mitigation, benches, picnic tables, bike racks), and abutter mitigation. Fencing and vegetative screening can be installed to retain the privacy of abutting properties.

For the purposes of this study, the cost estimate does not include the cost of:

- Land acquisition (permanent or temporary easements or takings)
- Utility relocations
- Hazardous materials handling, excavation, or disposal

Any estimated construction costs included in funding applications should be escalated using a flat inflation rate (4%) and compounded annually to account for expected increases in the cost of construction.

## Design Cost Estimate

The design cost is typically between 10% and 20% of the construction cost with the variation being attributed to the complexity of the design and extent of required permitting. It is recommended to include topographic survey for the entire design study area in the preliminary and final design.

As the MHBG will be a public facility, the City and/or another party will be responsible for maintenance to keep the trail in a safe, usable condition. There may be an opportunity to engage local volunteers in the maintenance and oversight of the path. The use of volunteer labor and/or resources could help reduce the operation and maintenance costs to the City.

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

The Rails-to-Trails Conservancy (RTC) Northeast Regional Office completed a study of various path/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 is available on RTC's website [<http://www.railtrails.org/>] and applicable sections in Appendix A of this Study. The City can consult this publication for valuable information on budgetary issues, staffing, equipment, and various other needs related to the operation and maintenance of a shared-use trail.

TABLE 1: UNIT COSTS FOR MAJOR WORK ITEMS

ITEM DESCRIPTION	UNIT COST
Sediment Control Barriers	\$5.50/linear foot
Clearing and grubbing	\$35,000/acre
4" Hot Mix Asphalt (HMA)	\$6.50/square foot
8" Gravel Borrow	\$150/cubic yard
2" compacted stone dust over 4" dense graded crushed stone for trail surface	\$2.50/square foot
8" dense graded crushed stone for parking areas	\$2.5/square foot
4" seeding	\$2.00/square yard
4" loam borrow	\$60.00/cubic yard
At-grade trail / roadway crossing treatments	\$12,500/crossing
Wood rail fence	\$50/linear foot
Wood rail fence / guardrail	\$75/linear foot
Chain Link Fencing	\$25-\$35/linear foot
White Pine or Norway Spruce (8'-10' tall)	\$500/each
Kiosk	\$2,000/each
Bike route sign on steel post	\$250/each
"Sharrow" pavement marking	\$60/each
Rectangular Rapid Flashing Beacon (RRFB)	\$20,000/crossing including both sides
Scenic Overlook at Matthew J. Kuss Middle School	\$50,000
Demolition of State Avenue Bridge	\$45,000

## TABLE 2: ESTIMATED CONSTRUCTION COST BY SEGMENT

	ACTIVITY / TASK	ESTIMATED CONSTRUCTION COST*
Segment 1A	<p>Construct 10-foot wide shared-use trail between State Avenue and Kennedy Park using hot mix asphalt (approximately 9,500 feet).</p> <p>Includes:</p> <ul style="list-style-type: none"> <li>• Sediment control barriers to wetland resource areas</li> <li>• 4" HMA surface over 8" gravel borrow for trail surface</li> <li>• Wood rail fence</li> <li>• Two (2) At-grade trail / roadway crossing treatments</li> <li>• Install Rectangular Rapid Flashing Beacon at Mount Hope Avenue</li> <li>• Clearing and grubbing</li> <li>• State Avenue bridge demolition</li> </ul> <p><u>Note:</u> Track and tie removal and reset and site preparation are not included in the estimated conceptual construction cost. In some areas, the width of the ROW, encroachments, and grade changes make a rail-with-trail design impractical and infeasible. In sections where a rail-with-trail design is feasible, it is presumed that the track and ties will still need to be removed and reset to provide necessary clearance for the trail.</p>	\$2,900,000
Segment 2	<p>Construct an on-road separated bike lane from Kennedy Park to Almond Street via Middle Street, Bay Street, William Street, and Almond Street (approximately 2,700 feet).</p> <p>Includes:</p> <ul style="list-style-type: none"> <li>• Directional signage and pavement markings for on-road bike route</li> </ul> <p><u>Note:</u> Sidewalk improvements are not included in the estimated conceptual construction cost. These improvements could be made as part of standard roadway maintenance.</p>	\$9,000
Segment 3	<p>Construct a 10-foot wide shared-use trail between Kennedy Park and Bay Street (approximately 2,100 feet).</p> <p>Includes:</p> <ul style="list-style-type: none"> <li>• 4" HMA surface over 8" gravel borrow for trail surface</li> <li>• Wood rail fence</li> <li>• Clearing and grubbing</li> </ul> <p><u>Note:</u> A potential intersection/at-grade crossing with Bay Street is not included. Track and tie removal and reset and site preparation are not included in the estimated conceptual construction cost. In some areas, the width of the ROW, encroachments, and grade changes make a rail-with-trail design impractical and infeasible. In sections where a rail-with-trail design is feasible, it is presumed that the track and ties will still need to be removed and reset to provide necessary clearance for the trail.</p>	\$650,000

**Note: All costs listed in Table 2 include a 30% contingency to account for details yet to be determined including, for example, landscaping, site amenities, and abutter mitigation.**

*\*In providing estimates of probable cost, it is recognized that the neither the City of Fall River nor Stantec have control over the costs of labor, equipment or materials, or over the Contractor's methods of determining process or bidding. The opinion of probable costs is based on Stantec's reasonable professional judgment and experience and does not constitute a warranty, express or implied, that the Contractor's bids or the negotiated price of the Work will not vary from the Client's budget or from any opinion of probable cost prepared by Stantec.*

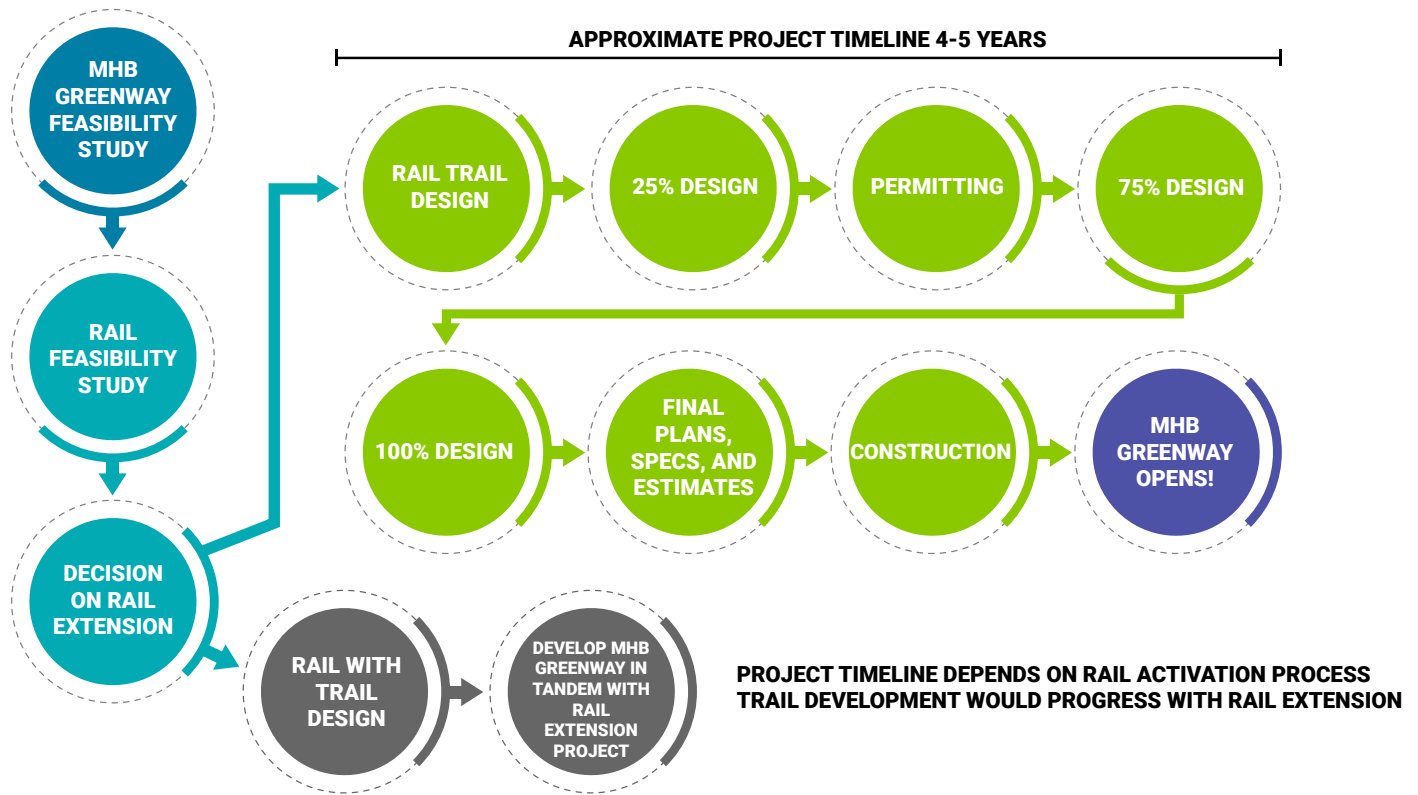
TABLE 2: ESTIMATED CONSTRUCTION COST BY SEGMENT (CONT.)

ACTIVITY / TASK		ESTIMATED CONSTRUCTION COST *
Segment 4	Construct a 10-foot wide shared-use trail between Bay Street and the proposed Battleship Cove MBTA Station (approximately 2,100 feet).  Includes: <ul style="list-style-type: none"> <li>• 4" HMA surface over 8" gravel borrow for trail surface</li> <li>• Wood rail fence</li> <li>• Clearing and grubbing</li> </ul> <p><u>Note:</u> Track and tie removal and reset and site preparation are not included in the estimated conceptual construction cost. In some areas, the width of the ROW, encroachments, and grade changes make a rail-with-trail design impractical and infeasible. In sections where a rail-with-trail design is feasible, it is presumed that the track and ties will still need to be removed and reset to provide necessary clearance for the trail.</p>	\$650,000
Segment 5	Construct an on-road separated bike lane from Almond Street to Ferry Street and would end at the northern terminus at Battleship Cove (approximately 4,000 feet).  Includes: <ul style="list-style-type: none"> <li>• Directional signage and pavement markings for on-road bike route</li> </ul> <p><u>Note:</u> Sidewalk improvements are not included in the estimated conceptual construction cost. These improvements could be made as part of standard roadway maintenance.</p>	\$13,000
<b>Preferred Route</b>	<b>Segments 1, 3, 4</b> (Including optional on-road connection to surrounding neighborhood)	<b>\$4,191,000</b> \$4,200,000

***Note:*** All costs listed in Table 2 include a 30% contingency to account for details yet to be determined including, for example, landscaping, site amenities, and abutter mitigation.

*\*In providing estimates of probable cost, it is recognized that the neither the City of Fall River nor Stantec have control over the costs of labor, equipment or materials, or over the Contractor's methods of determining process or bidding. The opinion of probable costs is based on Stantec's reasonable professional judgment and experience and does not constitute a warranty, express or implied, that the Contractor's bids or the negotiated price of the Work will not vary from the Client's budget or from any opinion of probable cost prepared by Stantec.*

FIGURE 25: POTENTIAL PROJECT TIMELINE FLOWCHART



## Project Funding

Prior to securing funding for the MHBG, the City of Fall River should make a decision about working to extend rail beyond the proposed Battleship Cove MBTA Station. Whether or not there will be rail service may make the project eligible for other funding sources and/or change the project's eligibility for the funding sources listed below. The project goal is to secure design and construction funding through public (federal, state, local) sources, grant programs, and private donors. This approach will help offset some of the project development costs to the City. In addition to the public funding sources available, there are a number of potential private and non-profit sources that could help advance the project from the study phase through construction. Potential funding sources include, but are not limited to, those listed in Table 3. Each of these potential funding programs is highly competitive.

**The following two programs – Transportation Enhancement Program and Congestion Mitigation and Air Quality Improvement Program – are administered by MassDOT and fund infrastructure projects of varying scope. These programs are typically used for multi-use path design and construction.**

If the Fall River Bicycle Committee and City were to pursue state and/or federal project funding, the two most commonly used funding programs for bicycle and pedestrian projects are the Transportation Enhancement (TE) Program and Congestion Mitigation and Air Quality (CMAQ) Improvement

Program. Both programs were originally funded through the Federal Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and continued via the Transportation Equity Act for the 21st Century (TEA-21). These programs are included in the current reauthorization of the Act, entitled The Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2003 (SAFETEA). The availability of State and Federal funding will dictate whether a multi-use path project will proceed through the TE or CMAQ Program.

Under both programs, the City or project proponent must demonstrate the project's feasibility to MassDOT. The City should consider initiating coordination with the Southeastern Regional Planning & Economic Development District (SRPEDD) about the potential future of the corridor so it may be included in regional planning documents. The first step of securing Transportation Improvement Program (TIP) funding would be to complete a Project Need (PN) form and submit it to (in Fall River's case) the MassDOT District 5 Office in Taunton through the Massachusetts Project Intake Tool (MaPIT). This form should also be forwarded to the SRPEDD for their files. This study and future work should be attached to the PN to provide additional information. The PN can be prepared with or without the help of a consultant. MassDOT will review the PN and evaluate the merits and readiness of the project. They will also provide the City or project proponent, with advice on how to proceed, both in terms of the design process and available funding sources. Pending approval of the PN, the next step is to prepare a Project Scope (PS) form.

## Transportation Enhancement (TE) Program

In order for a project to be considered for the TE Program, Fall River needs to submit a funding application to SRPEDD, which is responsible for selecting which regional projects are eligible for consideration as TE Program funded projects. Selected projects are reviewed for eligibility and preparedness for implementation before a project is forwarded to MassDOT and the State Transportation Enhancement Steering Committee. Under this program, the City or project proponent (applicant) is responsible for 10% of the project cost. Municipalities typically do one of the following to meet this requirement:

- Fund 10% of the design cost plus 10% of the construction cost; or
- Fund the entire design (which is typically between 10-20% of the construction cost depending upon project complexity)

With the first option, the applicant is responsible for 10% of the design cost and then the State reimburses the applicant the difference to complete the design. The applicant's 10% match for the construction is included in the final construction cost estimate as a list of "non-participating" items (which are items not funded by MassDOT under the specific contract). The applicant will be responsible for paying for the "non-participating" items in order to achieve their 10% requirement.

With the second option, the applicant funds the entire design which is often slightly more than the required 10% match. This option seems to be more widely used and demonstrates the applicant's commitment to advance the project through the

design phase. The applicant is responsible for administering the design contract through a MassDOT design and review process. The applicant does not provide any funding toward the construction phase of the project under this option. MassDOT would be responsible for project construction.

## Congestion Mitigation and Air Quality (CMAQ) Improvement Program

A shared-use path project often fits the eligibility requirements for both the TE Program and the Congestion Mitigation and Air Quality (CMAQ) Improvement Program of SAFETEA. CMAQ is a transportation air quality improvement program that provides funding for both bike and pedestrian facilities that serve to reduce automobile travel. The City or project proponent (applicant) must complete a CMAQ Air Quality Analysis Worksheet for Bicycle and Pedestrian Projects to document a quantifiable reduction in auto emissions and/or congestion to be eligible under this program. Under this program, the project cost is funded 80% Federal and 20% State or local match. The applicant must be prepared to provide a local funding commitment comprised of a cash match in the amount of 10% under the same scenarios described for the TE Program.

**The following program - Gateway City Parks Program - is a competitive program administered by the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) and has been widely used for shared-use path feasibility studies, design, and construction.**

### TABLE 3: POTENTIAL FUNDING SOURCES

FUNDING PROGRAM	ADMINISTERING AGENCY	FUNDING RANGE
Transportation Enhancement (TE) Program	MassDOT	Varies
Congestion Mitigation and Air Quality (CMAQ) Improvement Program	MassDOT	Varies
The Gateway Cities Parks Program	Massachusetts EOEEA	Average award is \$500,000
Community Preservation Act (CPA)	Fall River Community Preservation Committee (CPC)	Varies
Recreational Trails Program (RTP)	Massachusetts DCR	\$2,000 to \$50,000
MassTrails Grant Program	MassDOT	\$5,000 to \$300,000
Parkland Acquisitions and Renovations for Communities (PARC)	Massachusetts EOEEA	\$50,000 to \$400,000
People for Bikes	People for Bikes	Up to \$10,000
WalkBoston	WalkBoston	Varies
Safe Routes to School (SRTS) Program	MassDOT / MassRIDES	Less than \$500,000
Fields Pond Foundation	Fields Pond Foundation	\$2,000 to \$10,000
New England Grassroots Environment Fund (NEGEF)	NEGEF	\$500 to \$10,000
Kodak American Pathways Grant Program	Kodak	\$500 to \$10,000
Private Sources	Varies	Varies

## Gateway City Parks Program

The Gateway City Parks Program funds the creation and restoration of parks and recreational facilities in under served urban neighborhoods. The Gateway City Parks Program was established by the 2009 Energy and Environment Bond Bill and is administered by EOEEA. Fall River is one of 26 eligible Gateway Cities to apply for this program. The average grant size is \$500,000. Multiple Gateway Cities have been using this program to fund greenway, rail-trail, and riverwalk project design and construction. More information is available at <https://www.mass.gov/service-details/gateway-city-parks-program>

**The following program - Community Preservation Act - is administered by the City and funds local projects of varying scope.**

### Community Preservation Act

CPA gives communities an opportunity to create a Community Preservation Fund for open space protection, historic preservation, affordable housing and outdoor recreation. CPA is adopted by a community ballot vote, resulting in locally raised funds through a surcharge of not more than 3% of the tax imposed against real property. In addition, the Department of Revenue annually provides each community with distributions from the statewide Community Preservation Trust Fund, which serves as an incentive for communities. Upon adoption of the Act, each community creates a Community Preservation Committee (CPC) which is responsible for the recommendations of CPA projects. Dozens of communities have used CPA funds to develop recreational facilities by purchasing rights of way, funding design and construction and adding amenities to enhance the space for the community.

In 2012, Fall River residents voted to adopt the CPA which allowed a 1.5% surcharge on Property Tax bills to fund affordable housing, open space, and historic preservation projects. The Community Preservation Act requires that at least 10% of each year's Community Preservation revenues be spent or set aside for each of the three Community Preservation categories. The remaining 70% is available for spending on any one or more of the categories as the Committee and Town Meeting see fit.

**The following two programs – Recreational Trails Program and Parkland Acquisitions and Renovations for Communities – are also competitive programs administered by agencies under the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) that fund infrastructure projects of varying scope. These programs would be ideal funding sources for multi-use trail construction along the former railroad ROW.**

### Recreational Trails Program (RTP)

The Recreational Trails Program (RTP) provides federal funding support for a variety of trail development and maintenance projects and is administered on a reimbursement basis by the Massachusetts Department of Conservation and Recreation (DCR).

The RTP funds up to 80% of each trail project, with at least 20% of the total project cost funded by other sources. The match can consist of money from other sources such as non-Federal grants, donations, or municipal funds. A "soft match" in the form of materials, labor, and in-kind services is permitted. "Soft match" contributions include paid labor, volunteer/donated labor, purchased materials and services, and donated labor and materials. Grant amounts, not including the match, may range from \$2,000 to \$50,000. Requests greater than \$50,000 may be considered for regional or statewide projects.

Unlike the projects programmed for inclusion on the TIP or through TE or CMAQ, the RTP requires that projects be primarily recreational in nature, rather than transportation oriented. Priority will be given to projects that create or facilitate physical improvements that seek to protect or enhance the site's natural and cultural resource values while also satisfying a recreational demand. Historically, grant applications seeking funds for trail planning and design activities have not been received favorably. More information is available at: <https://www.mass.gov/guides/recreational-trails-program>

### MassTrails Grant Program

MassTrails provides matching grants to communities, public entities, and non-profit organizations to design, create, and maintain the diverse network of trails, trail systems, and trail experiences used and enjoyed by Massachusetts residents and visitors. Applications are accepted annually for a variety of well-planned trail projects benefiting communities across the state. Grant amounts are dependent on the project and its needs, but generally range from \$5,000 to \$100,000 with grants of up to \$300,000 awarded to projects demonstrating critical network connections of regional significance. More information is available at: <https://www.mass.gov/guides/masstrails-grants>

### Parkland Acquisitions and Renovations for Communities (PARC)

The Parkland Acquisitions and Renovations for Communities (PARC) Program is administered by EOEEA. The PARC program provides grant assistance to cities and towns to acquire parkland, develop new parks, or renovate existing outdoor public recreation facilities (formerly the Urban Self-Help Program). Municipalities must have a current open space and recreation plan to apply. The City of Fall River's current open space and recreation plan expires in August 2025. All properties for which grant assistance is provided must be open to the general public for appropriate active recreational use. Additionally, as the property will become protected open space under Article 97 of the Amendments to the Constitution of the Commonwealth of Massachusetts, the applicant must own the property in fee. Grants range from \$50,000 to \$400,000. More information is available at: <https://www.mass.gov/service-details/parkland-acquisitions-and-renovations-for-communities-parc-grant-program>

**The following three programs – People for Bikes, WalkBoston, and Safe Routes to School – support planning and small-scale infrastructure improvement projects. These programs are typically used for installing bike route signage and pavement markings, conducting bikeability or walkability audits, performing necessary ADA upgrades, and outreach and educational programs to encourage biking and walking in the community.**

### **People for Bikes**

People for Bikes (formerly Bikes Belong Coalition) is a nonprofit organization sponsored by partners in the bicycle industry. People for Bikes provides competitive national grants for projects that will “put more people on bicycles more often.” They will not consider projects in which People for Bikes is the sole funder but will consider proposals where they are the initial funder and the project sponsor is looking to leverage the money for other funding programs. In 2011, People for Bikes also launched a Community Grant Program which will primarily fund the construction or expansion of bicycle facilities such as bike lanes, trails, and paths. The grants committee will also consider advocacy projects that promote bicycling as a safe and accessible mode of transportation. Eligible applicants for this program include nonprofit organizations or a local government entity. Grants range from \$5,000 to \$10,000. More information is available at: <http://www.peopleforbikes.org>

### **WalkBoston**

WalkBoston is a nonprofit membership organization dedicated to improving walking conditions in cities and towns across Massachusetts. The organization’s mission is to create and preserve safe walking environments that build vital communities. They promote walking for transportation, health, and recreation through education and advocacy. More information is available at: <http://www.walkboston.org/>

### **Safe Routes to School (SRTS) Program**

The Massachusetts Safe Routes to School (SRTS) program helps to reduce congestion, air pollution, and traffic congestion near schools, while increasing the health, safety, and physical activity of elementary and middle school students. The program is managed by MassDOT with assistance from MassRIDES. The program is typically initiated by the school administration, parents’ association or municipality. In order to be eligible for infrastructure projects targeted to enhancing safe access to schools, a school must partner with MassRIDES on education, encouragement, enforcement, and evaluation activities and take part in safety training for 1 full year. Grants typically fund projects less than \$500,000. More information is available at: <https://www.mass.gov/safe-routes-to-school>

**The following three programs – Fields Pond Foundation, New England Grassroots Environmental Fund, and Kodak American Pathway Grant Awards Program – are smaller grant programs which focus on enhancing partnerships and building project support in the community. These programs are typically used for newsletters, visioning workshops, and educational programs to encourage biking and walking in the community.**

### **Fields Pond Foundation**

The primary mission of the Fields Pond Foundation is to provide financial assistance to nature and land conservation organizations that are community-based and serve to increase environmental awareness by involving local residents in conservation issues. Proposals from municipal government agencies are encouraged. The foundation accepts project grants for trail-making and other enhancement of public access to conservation lands, rivers, coastlines and other natural resources. They look for opportunities where a modest investment of grant funds can help in a significant way to improve public access to, and enjoyment of, natural areas while maintaining the health and integrity of the environment. Projects in which volunteerism is a significant component are more likely to be funded. The expected range of grants is \$500 to \$25,000, with most grant awards falling within the range of \$2,000 to \$10,000. The Foundation is willing to consider multiple-year grants. Proposals may be submitted at any time since the Directors meet regularly throughout the year. It is recommended that applicants contact the organization informally before preparing a formal application. More information is available at: <http://www.fieldspond.org/>

### **New England Grassroots Environment Fund (NEGEF)**

The New England Grassroots Environment Fund (NEGEF) supports volunteer-driven groups undertaking community-based environmental work in the New England region. They offer seed grants to support community groups launching new project and/or evolving the scale of an existing project. As examples, a prior grant was awarded to the Great Barrington Trails and Greenways Project to develop a public outreach program that included a monthly e-newsletter, a vision map, community walks, and meetings with community groups to promote broader participation. The Squannacook River Trail Committee in Townsend also received a grant to mail informational flyers to share news about the committee’s progress and urging residents to continue their support. Grants range from \$500 to \$10,000. More information is available at: <http://www.grassrootsfund.org/>

### **Kodak American Pathways Grant Awards Program**

The Kodak American Pathways Grant Awards Program is a partnership project of the Eastman Kodak Company, the Conservation Fund, and the National Geographic Society. The program provides small grants to stimulate the planning and design of pathways in communities throughout America. Grants may be used for activities such as: mapping, ecological studies, surveying, conferences, and design activities; developing brochures, interpretative displays, audio-visual productions or public opinion surveys; hiring consultants, incorporating land trusts, building a foot bridge, planning a bike trail, or other creative projects. In general, grants can be used for all appropriate expenses required to complete a pathway project including planning, technical assistance, legal and other costs. Letters of support from associated agencies, public officials, citizen groups, or nonprofit organizations must

be included with the application. Eligible applicants include local, regional, or Statewide nonprofit organizations. Although public agencies may also apply, community organizations receive preference. The maximum grant is \$2,500, however most awards range from \$500 to \$1,000. More information is available at: <http://www.conservationfund.org/>

**The Fall River Bicycle Committee and City could reach out to potential private donors both locally and statewide to seek project support and funding. Such donors could include local corporations, developers, or public health service providers (hospitals) as well as other nonprofit organizations such as the Trustees of Reservations or Trust for Public Land.**

## Private Sources

Many private companies and nonprofits have financial resources that they contribute as part of community outreach programs. For example, Intel Corporation of Hudson, Massachusetts donated funds and assistance, in the form of volunteers, to the Assabet River Trail project through their "Intel in the Community" program. In Salisbury, the Timberland Company, local contractors, town workers and volunteers sponsored a cooperative Earth Day work event to help construct an extension of the Salisbury Point Ghost Trail.





# REGULATORY REQUIREMENTS

This chapter discusses potential federal and state permit requirements for trail construction based on the environmental resources identified in the Physical Inventory & Assessment of the Right-of-way Chapter.

## Potential State Environmental Permits and Approvals

The following state environmental permits or approvals are likely required prior to construction of the MHBG for the protection of wetland areas:

### Massachusetts Wetlands Protection Act (310 CMR 10.00) Notice of Intent

A Wetlands Protection Act review is required when a project will impact wetland and water resources or their buffer zones. A Notice of Intent (NOI) will be required to be filed with the Fall River Conservation Commission. The NOI will be required because segments are within jurisdictional wetland areas or their 100-foot Buffer Zone to Wetland Resource Areas. The Riverfront Area boundary extends 25-feet from the Mean High Water Line associated with Mount Hope Bay. Segments can be combined for permitting or permitted separately.

NOI preparation and permit issuance period is approximately 2-3 months.

### Massachusetts Chapter 91 Authorization

Segments of the MHBG will require Chapter 91 Authorization from the MA Department of Environmental Protection (MassDEP) because they are within Chapter 91 jurisdictional areas. Review of existing licenses must occur prior to permitting and project segments can be combined for licensing.

The license application and issuance period is 9-12 months. Additionally, a Chapter 91 Authorization would trigger the Massachusetts Environmental Policy Act

### Massachusetts Environmental Policy Act – Environmental Notification Form (MEPA ENF)

In compliance with MEPA's anti-segmentation regulations, all segments of the MHBG must be reviewed as a single project. The project would exceed the MEPA wetlands threshold and require filing for an ENF. Additionally, a MEPA Certificate is required when a project meets or exceeds review thresholds identified for impacts to resources such as wetlands, endangered species habitat, and historical resources. ENF preparation and MEPA Certificate issuance period is approximately 3-6 months.

A Special Review Procedure for MEPA review may be an option and could offer a way to start the process earlier and enable the design team to change/add aspects of the project as it progresses.

## Potential Federal Environmental Permits and Approvals

The following federal environmental permits or approvals are likely required prior to construction of the MHBG for the protection of wetland areas:

### U.S. Army Corps of Engineers (USACE) - Section 404 Permit

Required for direct impact to wetland resources under federal jurisdiction or any work below ordinary high water (OHW). The planning-level goal would be to avoid direct impact to wetland resources. The preparation and permit issuance period for is 3-5 months.

### Coastal Zone Management Federal Consistency Review

The MHBG is located within jurisdictional area of the Massachusetts Coastal Zone Management (MCZM) Program. Assuming that there is a 'federal action' (i.e., federal funding or permit), the project will require a 'federal consistency review'

to ensure the project's reasonably foreseeable effects on any land or water use or natural resources of the Massachusetts coastal zone consistent with the MCZM program. MCZM Federal Consistency Review is generally completed as part of the MEPA review process.

A final determination of required permits will be made once wetland resources are delineated along the corridor and a preferred alternative is drafted on survey base mapping. The appropriate permit applications will need to be prepared and filed for agency review and approval before the start of project construction.

## Summary

Because the study corridor has the potential to impact wetland resource areas regulated by the Massachusetts Wetlands Protection Act (M.G.L. Chapter 131, §40) and its regulations (310 CMR 10.00) within the boundaries of Fall River, it is recommended that the project team consult with the City's Conservation Agent and Conservation Commission early in the design process. This discussion is intended to address concerns the Conservation Commission may have regarding potential adverse environmental impacts due to installation and operation of a shared-use trail prior to filing a Notice of Intent for construction. Coordination with state and/or federal agencies is also recommended.

During the permitting process, environmental regulatory agencies will require comprehensive alternatives analyses to demonstrate that environmental impacts have been avoided and minimized in the design. When impacts are not avoidable, agencies will review the design to see how environmental impacts have been mitigated.

## Archaeological and Historical Sites and Districts

If the project requires state or federal funding, licenses, or permits, it must be reviewed by the Massachusetts Historical Commission (MHC) in compliance with Federal Section 106 Review, under the National Historic Preservation Act of 1966 (16 USC 470), and/or State Chapter 254 Review (MGL Chapter 9 §26-27C). In this case, a Project Notification Form (PNF) would be prepared for MHC review to determine whether the project is likely to have an adverse effect on significant historic or archaeological resources. The PNF should be submitted as early as possible in the project planning process.

## National Environmental Policy Act (NEPA)

If federal funding is used for the MHBG, it will require a Programmatic Categorical Exclusion (CE) Determination to comply with the National Environmental Policy Act (NEPA). CEs are actions which individually or cumulatively do not involve significant social, economic or environmental impacts, and are therefore, categorically excluded from the requirement to prepare an Environmental Assessment (EA) or Environmental Impact Statement (EIS).

# APPENDIX

---

**APPENDIX A      SELECTED PAGES FROM RAIL-TRAIL MAINTENANCE & OPERATION: ENSURING THE FUTURE OF  
YOUR TRAIL - A SURVEY OF 100 RAIL-TRAILS**

## **APPENDIX A**

# **SELECTED PAGES FROM *RAIL-TRAIL MAINTENANCE & OPERATION: ENSURING THE FUTURE OF YOUR TRAIL - A SURVEY OF 100 RAIL-TRAILS***

---

**RAILS-TO-TRAILS CONSERVANCY (RTC) NORTHEAST  
REGIONAL OFFICE**

# Getting It Done

## VOLUNTEERS

Volunteers are at the heart of almost every trail maintenance effort. Even trails fortunate enough to have some paid maintenance staff will use volunteers whenever possible. This is the best way to stretch scarce trail maintenance dollars as far as possible. Here are some tips for using and finding volunteers:

- Volunteers should always work under the direction and supervision of a responsible adult. This person should preferably represent the entity that will be liable if any mishaps occur.
- Volunteers should not do anything that runs contrary to your insurance coverage, private property rights, laws, ordinances, regulations, etc.
- Power tools and equipment should not be operated by minors or in the presence of unattended children.
- Volunteers should not engage in any police or medical functions unless they are properly certified to do so.

If a trail is owned or managed by a nonprofit group, the most likely source of volunteers is the group's members. These individuals can get stretched thin, however, so it's a good idea to tap other sources of labor. Some of these include:

- Boy or Girl Scout troops and individual Eagle Scout candidates.
- School and church groups (youth and adult).
- Adult service clubs (Rotary, Kiwanis, Lions, etc.).
- The county court system or corrections department can often provide individuals who are incarcerated or have mandatory community service sentences.
- Alternative education programs for at-risk youth.
- United Way Day of Caring.

The more voluntary a person's participation is, the more he will want his time put to good use with a tangible result, such as planting a garden or building a picnic area, rather than picking up trash.

Another way to spread the maintenance load is through an adopt-a-trail program. This follows the adopt-a-highway model that many departments of transportation have. A business, community group, or even a single individual or family, agrees to take on certain routine maintenance functions for a section of the trail. Much like the highway program, "adopters" aren't going to fix the trail surface. But they can cut the grass, keep the trail clean and attractive, and inform the



Armstrong Trail, Pa. (Allegheny Valley Land Trust)



Baltimore & Annapolis Rail-Trail, Md. (Dave Dionne)



All: Capital Area Greenbelt, Pa. (Courtesy of Rails-to-Trails Conservancy)

regular trail maintenance organization of problems and hazards before they get out of hand. With existing skills or a modicum of instruction, volunteers can do almost everything associated with the maintenance and operation of a trail. Table 15 below lists some common maintenance tasks that volunteers may or may not be able to perform, and suggests some sources of assistance for more difficult tasks.

**Table 15:** Common Maintenance Tasks for Volunteers

VOLUNTEERS CAN MOST LIKELY...	VOLUNTEERS MAY NOT BE ABLE TO...	TO GET HELP WITH THIS TASK...
Keep the trail clear of trash and debris.	Haul material to a disposal facility.	Contact your local government or waste hauler.
Clear brush and trees.	Dispose of the material.	Borrow or rent a chipper.
Plant and maintain trees, shrubs and flowers and do most gardening and landscaping tasks.	Provide the items to be planted.	Get donated or discounted plant materials from a local nursery or home center. Establish an inventory of donated hand tools.
Operate mowers, trimmers and chain saws.	Supply their own tools.	Establish an inventory of donated power tools.
Operate a tractor, loader or bobcat.	Operate specialized heavy equipment like a dozer, grader or roller.	Ask your local road crew or hire a paid contractor.
Make minor repairs to non-asphalt trails.	Lay asphalt or operate a paving machine.	
Keep drainage structures clear.	Dig a trench and install pipes or culverts.	
Perform surface cleaning of restrooms.	Remove waste from portable toilets and restrooms.	Hire a paid contractor.
Install signs, gates, bollards and fences.	Manufacture same.	Purchase using donated funds, or get donated or discounted materials from a lumber yard or home center.
Build and install picnic tables, benches, kiosks and other wood structures.	Provide materials.	
Bridge decking and minor bridge and tunnel maintenance.	Structural inspection and maintenance of bridges and tunnels.	Hire a professional engineer and paid contractor.

## GETTING THE MOST FROM YOUTH VOLUNTEERS

- Have a goal for each outing.
- Youth want to feel that their tasks have a purpose.
- Emphasis the goal—accomplishing the goal is very important.
- Explain the tasks required to achieve the goal.
- Keep tasks short and simple, 2–3 hours at most, before losing attention.
- Change the goals and tasks from month to month to hold interest.
- Include hands on training for all tasks, no matter how simple.
- Stress safety. Be over-cautious and lead by example in using protective gear and proper techniques.
- Keep everyone involved.
- Include a short (one minute) educational talk.
- Include a new tool or skill as part of each project.
- Do not be afraid to discipline, which means “teach,” not “punish.”
- Thank them for improving the community and society.
- Many just want to be attached to something or someone positive.
- Emphasis that the trail is for public use and they are the public.
- Give them the sense that they benefit from their accomplished goals.
- Be ready for surprises.
- Look for and praise the positive.

## EQUIPMENT

Aside from major surfacing and resurfacing projects, most of the equipment needed for trail maintenance is within easy reach of trail maintenance organizations. If a county or municipality maintains the trail, there is a good chance that the park or road department will already own everything needed. Even volunteer groups have a good head start, as many of the tools are the same as what the average home owner uses for yard maintenance. Tools can be owned outright as a result of donation or purchase, or they can be borrowed or rented as needed. Tools and equipment that the average trail maintenance organization should have access to include the list at the right.

## HAND TOOLS

- Shovel—flat and round
- Rake—garden and leaf
- Hoe
- Cultivator
- Broom
- Digging bar
- Tamper
- Axe
- Hand saw
- Pruners and loppers
- Buckets and trash bags
- Rope or chain
- Carpentry tools (hammer, saw, screw drivers, etc.) can usually be brought by volunteers when required for a project.

## POWER TOOLS

- Walk-behind mower
- String trimmer
- Chain saw
- DR Trimmer or sickle-bar mower

## POWER EQUIPMENT

- Lawn tractor (mower)
- Garden tractor with attachments (mower, blade, loader, sickle-bar)

## LARGER POWER EQUIPMENT

(most likely rent or have contractor provide)

- Bobcat
- Chipper
- Loader/backhoe
- Dump truck
- Grader
- Bulldozer
- Paving machine
- Roller

# Appendix 1 – Resources for Trail Managers

There's a vast amount of information available for trail managers. This isn't intended to replace, supersede or duplicate any of those efforts, but merely to suggest a good direction in which to start.

Rails-to-Trails Conservancy (RTC) maintains four Web sites and a listserv:

- [www.railtrails.org](http://www.railtrails.org) — General information about RTC.
- [www.trailsandgreenways.org](http://www.trailsandgreenways.org) — Information for trail planners, builders and maintainers.
- [www.ntec.org](http://www.ntec.org) — National Transportation Enhancements Clearinghouse.
- [www.traillink.com](http://www.traillink.com) — Trail-finder service.

In addition, RTC maintains the Trails and Greenways listserv. This is an e-mail forum for the discussion of trails and greenways issues. You can ask a question and have it instantly distributed to hundreds of your colleagues across the country. It's a quick and easy way to get assistance, advice and a variety of perspectives.

You can subscribe to the listserv by sending an e-mail to [trailsandgreenways-subscribe@yahoogroups.com](mailto:trailsandgreenways-subscribe@yahoogroups.com). You will receive a welcome message with instructions on how to access listserv archives and other advanced features by registering with Yahoo, if you choose to do so.

- American Trails — [www.americantrails.org](http://www.americantrails.org)
- National Trails Training Partnership — [www.nttp.net](http://www.nttp.net)
- American Hiking Society — [www.americanhiking.org](http://www.americanhiking.org)
- National Trails Day — [www.nationaltrailsday.org](http://www.nationaltrailsday.org)

RTC, American Trails (which also hosts National Trails Training Partnership), and American Hiking Society (which also facilitates National Trails Day and the National Trails Directory) all provide numerous additional resource links.

For resources more specifically related to the region covered by this study, please visit RTC's Northeast Regional Office at [www.railtrails.org/field/northeast/default.asp](http://www.railtrails.org/field/northeast/default.asp).

## Appendix 2 – Maintenance Schedules

Twenty-five trails responded with more detailed information about when various maintenance tasks are done. Topping the list of daily tasks were patrols by police and non-police agencies, followed by cleaning of restrooms. On a weekly basis, trails often do light clean-up work on the trail and trailheads, empty trash cans, do additional restroom cleaning, and cut the grass. Trails that don't have the resources to get to these things on a weekly basis do them monthly. It is quite common, especially for all-volunteer operations, to have monthly work days. Once a year seems to be a good frequency for applying herbicides, cleaning culverts, inspecting bridges, and catching up on non-critical repairs. Hands down, "as needed" is the most common frequency for all maintenance tasks except for trash and toilets. Here is the table of responses:

**Table 16: Frequency of Common Maintenance Tasks**

Maintenance Activity	How often is it done?						
	Day	Week	Month	Quarter	Year	As Needed	Other
Repaving of asphalt trail						5	
Coating or sealing of asphalt trail						5	5 years
Pothole repair on asphalt trail						5	
Snow removal from asphalt trail						6	
Surface cleaning of asphalt trail		1	2	1		4	
Pavement markings maintenance and replacement					2	3	
Resurface non-asphalt trail						12	
Grade non-asphalt trail					2	8	
Pothole repair and other patches on non-asphalt trail				1		13	
Snow removal from non-asphalt trail						2	
Surface cleaning of non-asphalt trail				1		5	
Keep trail-side land clear of trash and debris	1	4	5		3	9	
Mowing		7	5	1	2	6	
Leaf removal			2		3	8	
Tree pruning		1	1		3	17	
Tree removal			1		1	17	
Invasive species removal			1			12	
Planting new vegetation					1	7	
Application of herbicides or pesticides					5	6	
Clearing of drainage channels and culverts					4	18	
Surface maintenance of parking areas		2		1	3	12	
General maintenance of trailheads (litter clean-up, etc.)	1	6	1		1	9	
Landscaping/gardening at trailheads		4	2	1	2	4	
Empty trash cans at trailheads		2	3	1			2

Maintenance Activity	How often is it done?						
	Day	Week	Month	Quarter	Year	As Needed	Other
Maintenance of stationary toilets at trailheads (clean, empty, etc.)	4	2				1	
Maintenance of portable toilets at trailheads (clean, empty, etc.)		6				2	
Empty trash cans along trail		4				1	
Maintenance of stationary toilets along trail (clean, empty, etc.)	1	2					
Maintenance of portable toilets along trail (clean, empty, etc.)		2					
Maintenance of informational kiosks (repairs, etc.)		1	3		1	8	
Maintenance of picnic tables, benches, etc.				1		10	
Updating information in informational kiosks		2	1	2	1	8	
Installation of signs					1	19	
Repair/maintenance of signs					3	17	
Installation of pavement markings						4	1
Maintenance of pavement markings						3	
Patrols by police agency	7	1				5	random
Patrols by non-police agency (e.g. trail watch)	5	3				1	ongoing
Recovery from illegal acts such as dumping and vandalism	3		1		1	11	
Installation of lighting						1	
Maintenance of lighting						2	
Installation of emergency call boxes							—
Maintenance of emergency call boxes							—
Installation of gates, bollards and fencing						11	
Maintenance of gates, bollards and fencing			1			16	
Bridge, tunnel, underpass and crossing inspection	1	1		1	3	6	2-3 years
Bridge redecking						14	
Paint/stain/treat bridge deck or structure					1	6	
General bridge maintenance					2	14	
Tunnel lighting maintenance							—
Tunnel open/closed status							—
Paint tunnel/underpass walls and ceiling						2	
General tunnel/underpass maintenance						4	
Railroad grade crossing maintenance					1	4	
Road grade crossing maintenance		1			1	11	

The Chester County (Pennsylvania) Parks and Recreation Department submitted this detailed maintenance schedule for the Struble Trail:

Activity	January					February					March					Total Hours
	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	
Mowing													5			5
Trimming													5			5
Trash	2	2	2	2		2	2	2	2		2	2	2	2		26
Weeding														2		2
Invasive spraying																0
Bush hog																0
Signage																0
Fence repair												10				10
Pruning																0
Invasive pruning												20				20
Designated projects																0
Culverts																0
Gates																0
Bridge inspection									0.5							0.5
Grade ditches																0
Crosswalks																0
Trail surface																0
Flower bed planting																0
Storm damage																0
Vandalism																0

Activity	April					May					June					Total Hours
	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	
Mowing	5		5	5		5	5	5	5	5	5	5	5	5		60
Trimming	5		5	5		5	5	5	5	5		5	5	5	5	60
Trash	2	2	2	2		2	2	2	2	2	2	2	2			26
Weeding				2				2						2		6
Invasive spraying						10					10					20
Bush hog				16												16
Signage								20								20
Fence repair												10				10
Pruning			40													40
Invasive pruning																0
Designated projects											120					120
Culverts																0
Gates	6					6										12
Bridge inspection																0
Grade ditches																0
Crosswalks	6															6
Trail surface									16							16
Flower bed planting		10														10
Storm damage																0
Vandalism																0

Activity	July					August					September					Total Hours
	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	
Mowing	5		5		5	5		5	5			5	5		5	45
Trimming	5		5		5	5		5	5			5	5		5	45
Trash	2	2	2	2	2	2	2	2	2		2	2	2	2	2	28
Weeding				2					2				2			6
Invasive spraying	10					10					10					30
Bush hog											16					16
Signage								20								20
Fence repair							10									10
Pruning												40				40
Invasive pruning																0
Designated projects								120								120
Culverts																0
Gates																0
Bridge inspection																0
Grade ditches																0
Crosswalks																0
Trail surface																0
Flower bed planting																0
Storm damage																0
Vandalism																0

Activity	October					November					December					Total Hours
	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	W1	W2	W3	W4	W5	
Mowing		5		5												10
Trimming		5		5												10
Trash	2	2	2	2		2	2	2	2	2	2	2	2	2		26
Weeding																0
Invasive spraying			10													10
Bush hog																0
Signage																0
Fence repair				10												10
Pruning																0
Invasive pruning							20									20
Designated projects																0
Culverts							8									8
Gates																0
Bridge inspection																0
Grade ditches						16										16
Crosswalks																0
Flower bed planting																0
Trail surface																0
Storm damage																0
Vandalism																0

## Appendix 3 — Budgets

As discussed in the narrative and demonstrated in the maintenance schedules in Appendix 2, trail maintenance is very much an ad-hoc business. Maintenance is done “as needed” and as funds present themselves — an approach that does not lend itself to meticulous budgeting. A couple of trails were kind enough to submit detailed budgets, and those follow.

The Chester County (Pennsylvania) Parks and Recreation Department submitted this detailed budget for the Struble Trail:

Activity	Times	Man Hours	Wages	Equipment Hours	Equipment Costs	Materials Costs	Transportation Costs	Total
Mowing	24	120	\$1,957	96	\$499	\$0	\$408	\$2,864
Trimming	24	120	\$1,380	96	\$86	\$0	\$0	\$1,466
Trash	52	110	\$743	0	\$0	\$30	\$884	\$1,657
Weeding	7	14	\$133	0	\$48	\$30	\$0	\$211
Invasive Spraying	6	60	\$682	0	\$40	\$60	\$102	\$884
Bush Hog	2	32	\$431	30	\$252	\$0	\$36	\$719
Signage	2	40	\$540	0	\$20	\$200	\$34	\$794
Fence Repair	4	40	\$454	0	\$20	\$300	\$68	\$842
Pruning	2	80	\$1,271	40	\$80	\$0	\$34	\$1,385
Invasive Pruning	2	40	\$540	20	\$40	\$0	\$34	\$614
Designated Projects	2	240	\$3,814	80	\$672	\$1,400	\$136	\$6,022
Gates	2	12	\$162	0	\$10	\$10	\$0	\$182
Culverts	1	8	\$91	0	\$10	\$20	\$17	\$138
Bridge Inspection	1	0.5	\$10	0	\$0	\$0	\$0	\$10
Grade ditches	1	16	\$182	0	\$10	\$10	\$17	\$219
Crosswalks	1	6	\$69	0	\$4	\$10	\$17	\$100
Trail Surface	1	16	\$182	0	\$5	\$30	\$17	\$234
Flower Bed Planting	1	10	\$95	0	\$5	\$120	\$17	\$237
Storm Damage	4	30	\$341	10	\$21	\$50	\$68	\$480
Vandalism	3	20	\$318	0	\$10	\$240	\$51	\$619
<b>Grand Total</b>								<b>\$19,677</b>

The following was submitted for the Heritage Rail Trail County Park in York, Pennsylvania. The trail was developed by the York County Rail-Trail Authority, the only entity of its kind devoted exclusively to rail-trail development. The trail is now maintained by the York County Parks and Recreation Department.

Maintenance Activity	Approximate annual labor cost	Approximate value of donated services	Approximate annual equipment & material cost	Total annual cost
Resurface non-asphalt trail	\$70,000			\$70,000
Grade non-asphalt trail				\$0
Pothole repair and other patches on non-asphalt trail	\$1,000			\$1,000
Snow removal from non-asphalt trail				\$0
Surface cleaning of non-asphalt trail				\$0
Keep trail-side land clear of trash and debris	\$5,200	\$5,200		\$10,400
Mowing	\$25,000		\$9,320	\$34,320
Leaf removal	\$1,000			\$1,000
Tree pruning	\$3,200		\$1,800	\$5,000
Tree removal				\$0
Invasive species removal				\$0
Planting new vegetation				\$0
Application of herbicides or pesticides	\$4,000			\$4,000
Clearing of drainage channels and culverts	\$3,000			\$3,000
Surface maintenance of parking areas				\$0
General maintenance of trailheads (litter clean-up, etc.)	\$1,500	\$1,500		\$3,000
Landscaping / gardening at trailheads	\$4,000		\$4,000	
Empty trash cans at trailheads	\$1,500			\$1,500
Maintenance of stationary toilets at trailheads (clean, empty, etc.)	\$9,000		\$1,000	\$10,000
Maintenance of portable toilets at trailheads (clean, empty, etc.)	\$2,400			\$2,400
Empty trash cans along trail				\$0
Maintenance of stationary toilets along trail (clean, empty, etc.)				\$0
Maintenance of portable toilets along trail (clean, empty, etc.)				\$0
Maintenance of informational kiosks (repairs, etc.)	\$1,000			\$1,000

Maintenance Activity	Approximate annual labor cost	Approximate value of donated services	Approximate annual equipment & material cost	Total annual cost
Maintenance of picnic tables, benches, etc.	\$250		\$250	\$500
Updating information in informational kiosks	\$500			\$500
Installation of signs	\$3,000		\$1,200	\$4,200
Repair/maintenance of signs	\$1,000			\$1,000
Installation of pavement markings	\$3,300		\$4,500	\$7,800
Maintenance of pavement markings	\$700		\$700	\$1,400
Patrols by police agency	\$20,000		\$12,000	\$32,000
Patrols by non-police agency (e.g. trail watch)		\$3,000		\$3,000
Recovery from illegal acts such as dumping and vandalism				\$0
Installation of lighting				\$0
Maintenance of lighting				\$0
Installation of emergency call boxes				\$0
Maintenance of emergency call boxes				\$0
Installation of gates, bollards and fencing				\$0
Maintenance of gates, bollards and fencing	\$3,500		\$1,400	\$4,900
Bridge, tunnel, underpass and crossing inspection	\$2,500			\$2,500
Bridge redecking				\$0
Paint/stain/treat bridge deck or structure				\$0
General bridge maintenance	\$50,000			\$50,000
Tunnel lighting maintenance				\$0
Tunnel open/closed status				\$0
Paint tunnel/underpass walls and ceiling				\$0
General tunnel/underpass maintenance				\$0
Railroad grade crossing maintenance	\$3,000			\$3,000
Road grade crossing maintenance	\$2,200			\$2,200
<b>Totals</b>	<b>\$146,750</b>	<b>\$13,700</b>	<b>\$32,170</b>	<b>\$192,620</b>

The following budget was submitted for the Capital Area Greenbelt in Harrisburg, Pennsylvania.

Maintenance Activity	Labor cost	Donated services	Equipment & material cost materials	Donated equipment & cost for activity	Approximate total annual
Resurface non-asphalt trail		\$2,000	\$2,000	\$3,500	\$7,500
Grade non-asphalt trail					\$0
Pothole repair and other patches on non-asphalt trail		\$1,000	\$500	\$1,500	\$3,000
Snow removal from non-asphalt trail					\$0
Surface cleaning of non-asphalt trail					\$0
Keep trailside land clear of trash and debris		\$1,000	\$1,000		\$2,000
Mowing		\$2,000	\$1,000	\$2,000	\$5,000
Leaf removal					\$0
Tree pruning					\$0
Tree removal	\$500	\$800	\$200	\$1,000	\$2,500
Invasive species removal		\$1,000	\$500	\$800	\$2,300
Planting new vegetation		\$3,000	\$2,000	\$3,000	\$8,000
Application of herbicides or pesticides		\$1,000	\$300	\$1,000	\$2,300
Clearing of drainage channels and culverts		\$500	\$200	\$500	\$1,200
Surface maintenance of parking areas	\$2,000	\$1,000	\$300	\$1,000	\$4,300
General maintenance of trailheads (litter clean-up, etc.)		\$200	\$100	\$500	\$800
Landscaping / gardening at trailheads		\$3,000	\$2,000	\$3,000	\$8,000
Empty trash cans at trailheads	\$1,500		\$2,000	\$2,000	\$5,500
Maintenance of stationary toilets at trailheads (clean, empty, etc.)					\$0
Maintenance of portable toilets at trailheads (clean, empty, etc.)					\$0
Empty trash cans along trail					\$0
Maintenance of stationary toilets along trail (clean, empty, etc.)					\$0
Maintenance of portable toilets along trail (clean, empty, etc.)					\$0
Maintenance of informational kiosks (repairs, etc.)					\$0

Maintenance Activity	Labor cost	Donated services	Equipment & material cost materials	Donated equipment & cost for activity	Approximate total annual
Maintenance of picnic tables, benches, etc.					\$0
Updating information in informational kiosks		\$300	\$100	\$200	\$600
Installation of signs		\$200	\$300	\$500	\$1,000
Repair/maintenance of signs		\$200	\$300	\$500	\$1,000
Installation of pavement markings					\$0
Maintenance of pavement markings					\$0
Patrols by police agency	\$30,000				\$30,000
Patrols by non-police agency (e.g. trail watch)					\$0
Recovery from illegal acts such as dumping and vandalism					\$0
Installation of lighting	\$100		\$100		\$200
Maintenance of lighting	\$200		\$500		\$700
Installation of emergency call boxes					\$0
Maintenance of emergency call boxes					\$0
Installation of gates, bollards and fencing	\$1,000	\$200	\$100	\$20,000	\$21,300
Maintenance of gates, bollards and fencing	\$300	\$10,000	\$200	\$15,000	\$25,500
Bridge, tunnel, underpass and crossing inspection	\$50	\$50	\$50	\$50	\$200
Bridge redecking					\$0
Paint/stain/treat bridge deck or structure	\$300	\$600	\$300	\$1,000	\$2,200
General bridge maintenance	\$100	\$500	\$1,000	\$1,000	\$2,600
Tunnel lighting maintenance					\$0
Tunnel open/closed status					\$0
Paint tunnel/underpass walls and ceiling					\$0
General tunnel/underpass maintenance					\$0
Railroad grade crossing maintenance					\$0
Road grade crossing maintenance					\$0
<b>Totals</b>	<b>\$36,550</b>	<b>\$28,550</b>	<b>\$16,050</b>	<b>\$58,050</b>	<b>\$139,200</b>