



THE LAWRENCE & LILLIAN SOLOMON FOUNDATION

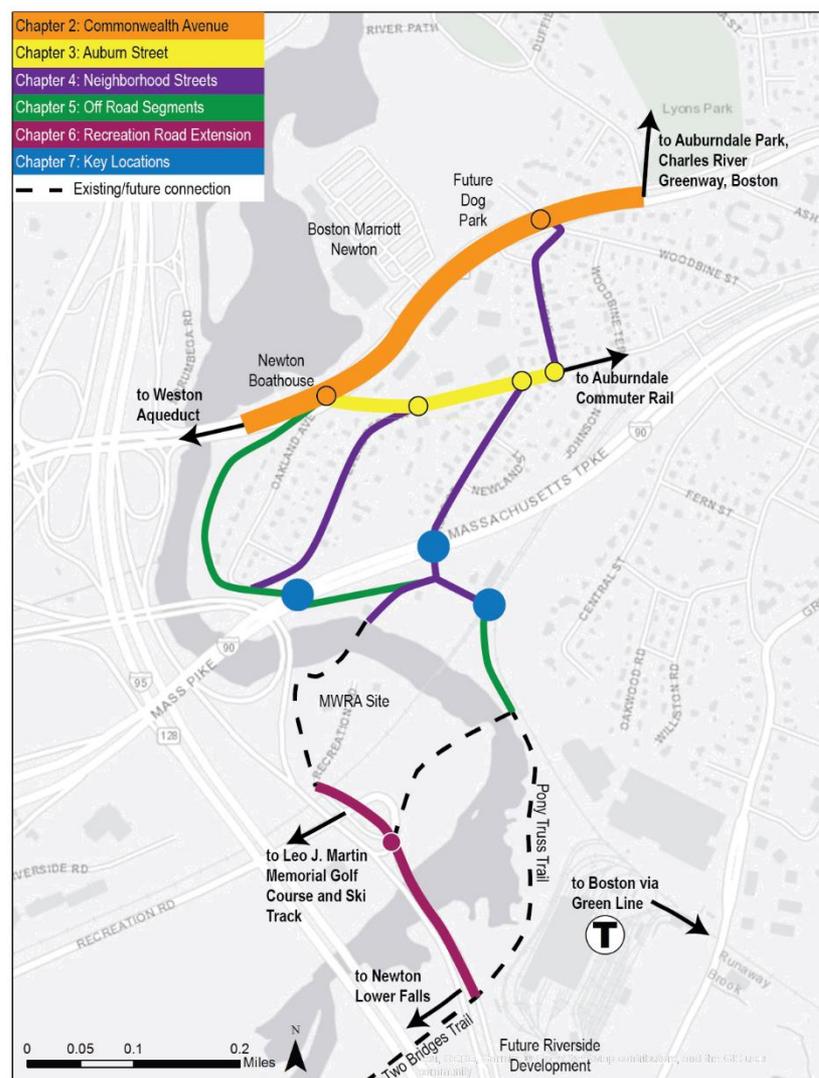
The Riverside Greenway Working Group Conceptual Plan February 18, 2019

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Chapter 1: Introduction

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Introduction

The idea of a connected park system along the Charles River was first put forward by Charles Eliot in the 1890s. Since then, various open spaces and parks have been established along the river, but gaps between them remain and some parklands are isolated and difficult to reach. One of the most notable gaps is between Norumbega Park, the Charles River Reservation, and Newton Lower Falls. The Riverside Greenway will make these connections while providing opportunities for recreation and a new active transportation corridor. The *Riverside Greenway Conceptual Plan* appraises options and design alternatives for constructing the Riverside Greenway.

The Riverside Greenway will provide a key link in the Boston regional trail network. It will connect numerous recreation areas and transportation nodes. It will link the Upper Charles River and Blue Herron paths in Auburndale with Newton Lower Falls and Riverside Park via a separated path that provides a low stress connection for people of all ages and abilities. It will extend the existing greenway network by providing a connection from the end of the Green Line D at Riverside station and overcoming the barriers of I-95, the MassPike/I-90, and Commonwealth Avenue. Numerous parks and recreation opportunities west of I-95 will be unlocked for people from Boston, while people west of I-95 will be able to reach the Riverside MBTA station on foot or by bike to travel into Boston. The Riverside Greenway is a key piece of realizing a Greener Greater Boston.

The Solomon Foundation, in partnership with state and local agencies, initiated the *Riverside Greenway Conceptual Plan*. The Plan is the next step in making the cohesive Riverside Greenway a reality. This Plan provides an assessment of the feasibility of the Riverside Greenway and outlines next steps to advance it.



Report Organization

Chapter 1: Introduction describes the Riverside Greenway Vision and Goals, provides an overview of the area, and discusses other concurrent projects and the process used to develop this report.

Chapters 2-7 describe each segment of the Greenway in detail: existing conditions and potential opportunities, alternatives considered, and recommendations for next steps.

Chapter 8: Implementation provides the Greenway Implementation Plan, describing project phasing, cost estimates, and next steps.

Note that the terms “walking” and “pedestrian” are used inclusively in this report to include anyone using a mobility assistance device. However, some of the off-road segments described in Chapter 5 will not be in compliance with the Americans with Disabilities Act (ADA).



Looking south towards the Newton Boathouse on Commonwealth Avenue and the Pigeon Hill neighborhood. I-95/Route 128 is on the right, and the MassPike/I-90 crosses at the top right corner.

Context

Approximately 180,000 people live within 5 miles of the Riverside Greenway study area. While there are no Environmental Justice communities within or adjacent to the study area, it is well-served by transit and thereby accessible to many more people beyond the immediate area: the D-Branch of the Green Line ends at Riverside, the Framingham/Worcester Commuter Rail stops at Auburndale, and there is bus service along Commonwealth Avenue and at the MBTA Riverside station.

While there is much open space throughout the area, these resources are not connected to each other. The Riverside Greenway seeks to connect these open spaces with walking and biking connections much like a 'linear park.' This would enable people enjoying the Blue Heron Paths in Lyons Park to walk or bike to the facilities at the Leo J. Martin Golf Course, to the Riverside T stop, or to Newton Lower Falls.

Summary of Existing Conditions

The Existing Conditions Memorandum is provided in Appendix A. Among the key findings from the memorandum are:

- There are historic resources in the area, but the Riverside Greenway is not anticipated to impact them.
- There are no Areas of Critical Environmental Concern, endangered species, or municipal conservation restrictions.
- The Charles River within the study area may be subject to the Wetlands Protection Act, the Clean Water Act and the Rivers Protection Act. Permitting requirements are taken into consideration in the Implementation Chapter.
- Most vehicular crashes occur on Commonwealth Avenue at the Marriott driveway, followed by the Commonwealth Avenue-Auburn Street intersection.



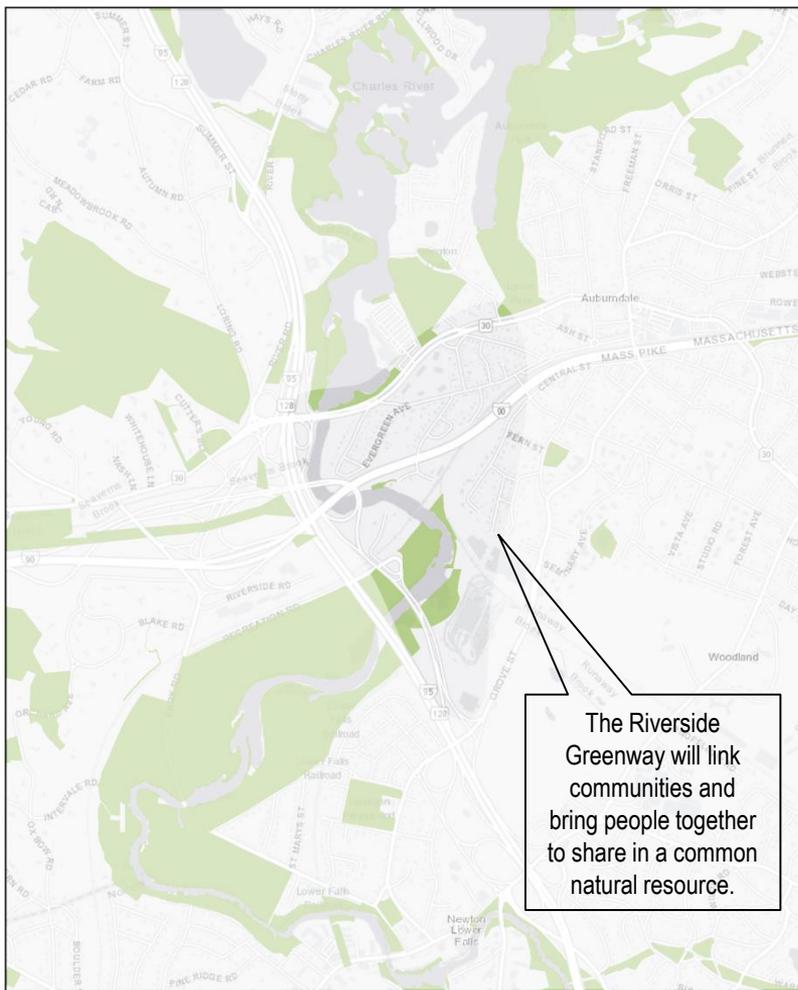
Vision & Goals

The 1998 Upper Charles River Reservation Master Plan set forth goals that still apply to this study area even 20 years later. The 1998 vision and goals were reviewed and revised to apply specifically to the Riverside Greenway project.

Vision: Link communities and bring people together to share in a common natural resource.

Goals

1. Improve access to the river and/or greenway for people walking, biking, or taking part in other activities.
2. Improve circulation and open space connections along the river corridor.
3. Protect and enhance the character of open space and the shoreline along the River.
4. Protect and improve visual/scenic quality.
5. Limit potential conflicts between activities.



MA Protected OpenSpace
Area in center of map is study area

Service Layer Credits: Esri, HERE, Garmin, ©
OpenStreetMap contributors, and the GIS user
community



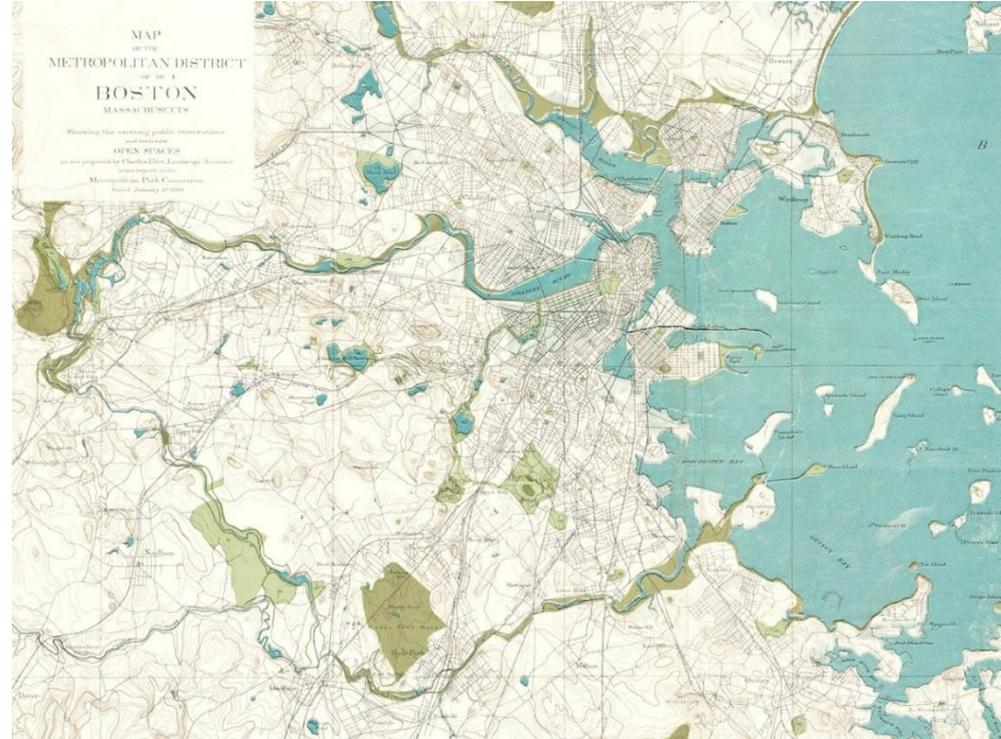
Area History

This area of Newton and the Upper Charles River is known as the Lakes District. Charles Eliot wrote a report to the Metropolitan Park Commission (predecessor to the Massachusetts Department of Conservation and Recreation (DCR)) in 1893 (see map, right) outlining the open spaces that the region should provide for its residents. In 2018, the Livable Streets Alliance notes that:

*Through the efforts of urban park pioneers Frederick Law Olmsted and Charles Eliot, **Boston has a rich legacy of linear parks and greenways, but they were never finished.** The Emerald Network builds on this portfolio of 100 miles of greenways to create a seamless 200-mile network across the urban core, from the Mystic River in the north to the Neponset River in the south.*

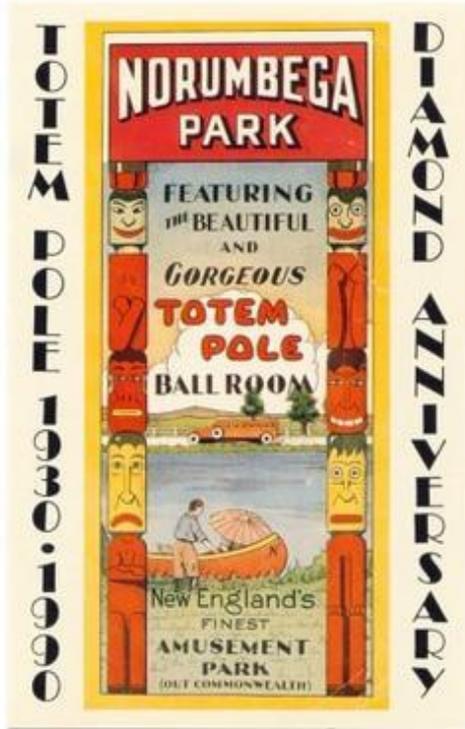
-Livable Streets Alliance Emerald Network:
<https://www.emeraldnetwork.info/vision>

Historic Newton, a partnership between the Newton Historical Society and the City of Newton, indicates that the Upper Charles River Lakes District was an immensely popular recreation area in the late 1800s, particularly for canoeing. The local railroads built an amusement park called Norumbega Park to entice people to take rail out to the Lakes District. After World War II when automobile ownership became more common, the Lakes District went into decline and the Charles River became too polluted to swim or boat. (https://en.wikipedia.org/wiki/Norumbega_Park) Norumbega Park closed in 1963 and eventually the Marriott Hotel was constructed on the site. Although the Charles River has been cleaned up, the area has been relatively unused since then, despite its natural beauty.



1893 Metropolitan Park Commission Open Space map showing a greenway through the Lakes District (source: Boston Public Library <https://collections.leventhalmap.org/search/commonwealth:wd376704k>)

Area History (continued)



Canoeing on the Charles:

<http://www.newtonma.gov/gov/historic/events/past/canoeing/default.asp>

https://en.wikipedia.org/wiki/Norumbega_Park

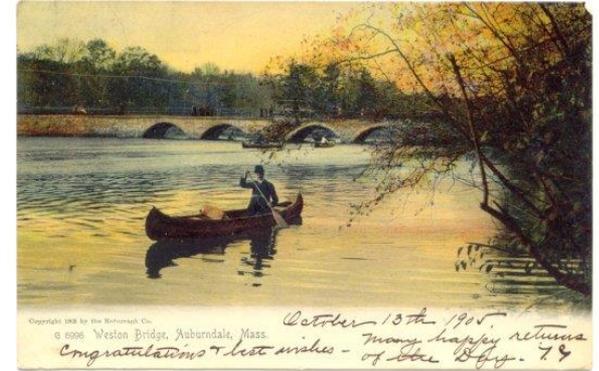


METROPOLITAN POLICE STATION, NEWTON, MASS.



Canoeing on the Charles.

Published by Metropolitan News Co., Boston.



Copyright 1928 by the Hutchinson Co.
© 1928 Weston Bridge, Auburndale, Mass.

October 13th 1905.
Many happy returns
Congratulations - Best wishes - of the City - 79



Public Boat Houses at Riverside, showing Riverside Station and R. R. Bridge.

Published by The Metropolitan News Co., Boston.

Photos from Historic Newton

<http://www.newtonma.gov/gov/historic/events/past/canoeing/default.asp>
and Wikipedia https://en.wikipedia.org/wiki/Norumbega_Park.

Site Assets, Barriers, & Opportunities

A primary purpose of the Riverside Greenway is to connect people to the Charles River and its tranquil shoreline. In addition, there are numerous other assets in the study area, as shown in the map to the right.

Commonwealth Avenue, although an important connection between the Upper Charles and the Charles River Reservation, is also a barrier to the Riverside Greenway. Commonwealth Avenue is an arterial roadway and provides access from I-95 and to Boston and Newton. There are no marked crossings on Commonwealth Avenue within the study area, and vehicle speeds are posted for 30-35 MPH. There are no bicycle facilities in the project area. There are missing sidewalks, and some sidewalks are in poor condition. Commonwealth Avenue's cross section varies considerably through this area, with a wide center median in the western portion and a parallel carriage road in the eastern portion.

I-90/MassPike is another barrier in the study area, but there are two underpasses under it. One at the end of Charles Street and another is at the top of Pigeon Hill where Evergreen Avenue and Oakland Avenue meet. The passage on Charles Street is dark and foreboding to people walking or biking, and the underpass at the top of Pigeon Hill is fenced off and closed to the public per MassDOT.

The MBTA Commuter Rail tracks also serve as a significant barrier. The historic Riverside Depot Pedestrian tunnel has been closed off. The nearest safe access across the rail tracks is Woodland Road. The tunnel is under consideration for improvement. A tunnel assessment was completed as part of this study (Appendix B) to understand the amount of work needed to reopen it for people.



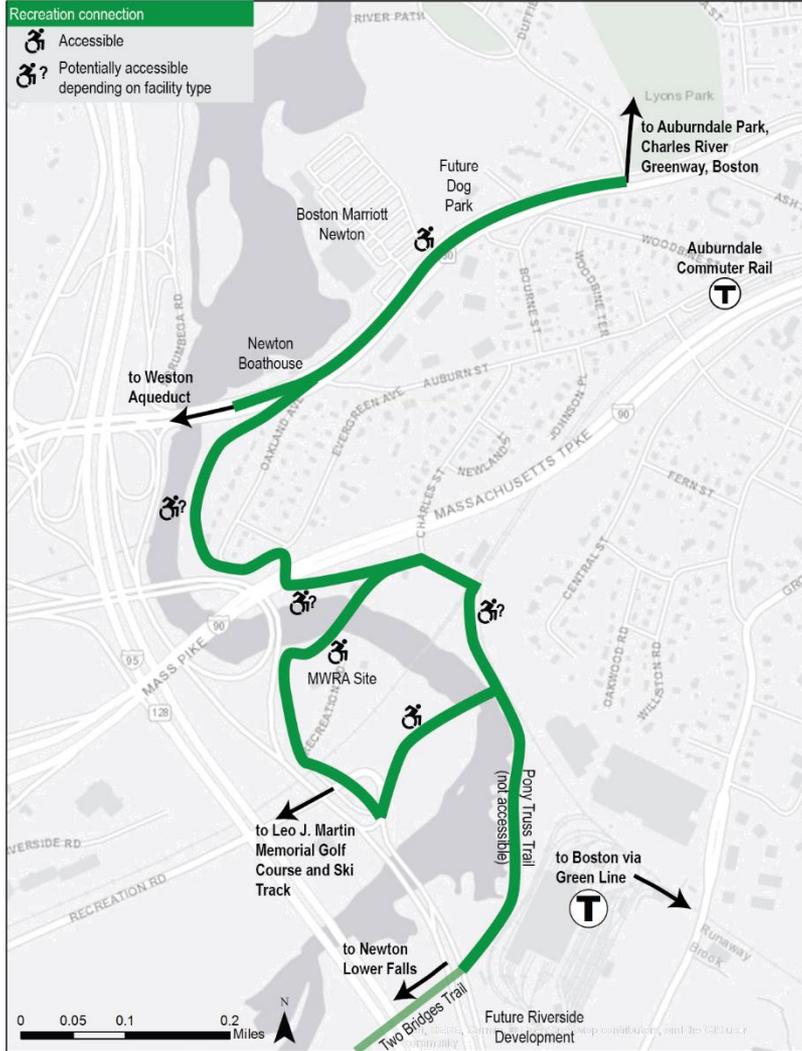
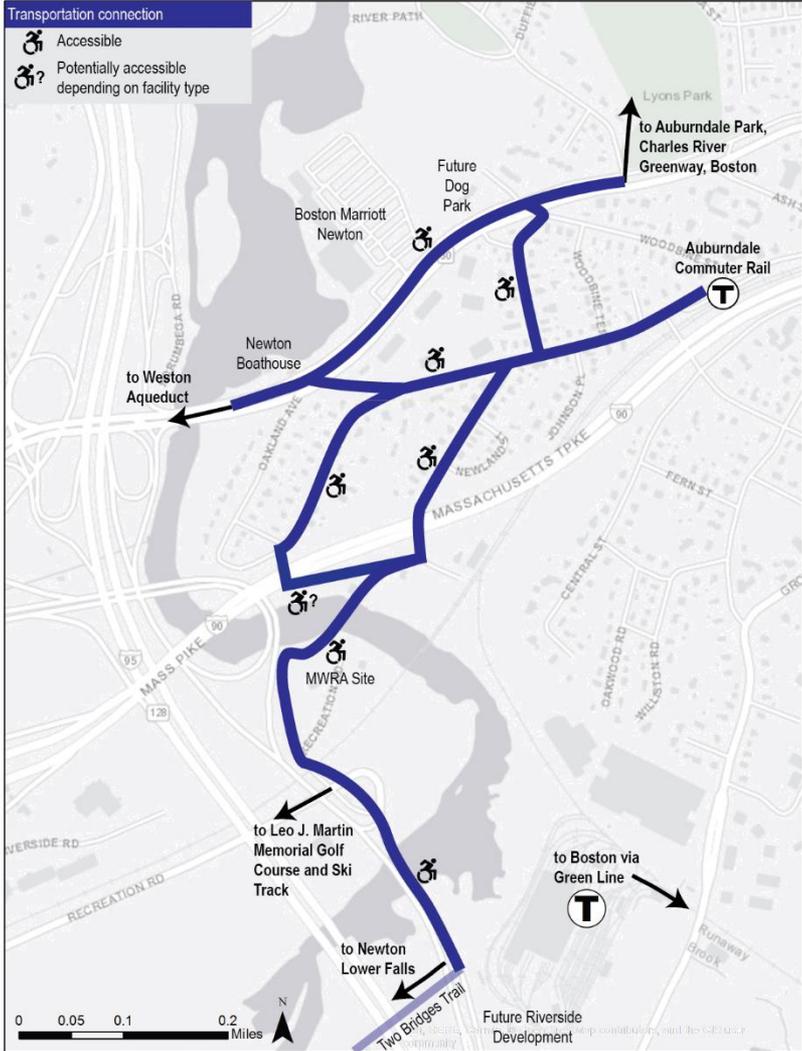
Transportation and Recreation



Looking west towards Riverside Park (center). The MBTA Riverside T Station is just off to the left and the Commuter Rail Tracks are shown on the right.

Some of the goals described on page 1-7 are aimed more at recreation purposes, while others are more transportation-oriented in nature. Therefore, some segments of the Riverside Greenway accomplish both transportation and recreation goals, while others are more singular. For example, the maps on the following page show that on-street segments (such as those along Charles Street and Auburn Street) provide more direct routes to regional destinations, and the recommended facility type (in this case, a bicycle boulevard, as described in Chapter 4) reflects this. In contrast, off-road segments such as the footpath between the Charles River and the Oakland Avenue are more about putting people in touch with the natural context of the River and offering opportunities for peace and solitude.

The maps on the following page suggest which segments are more transportation-oriented and which are more recreation-oriented. Note that several segments serve both purposes.

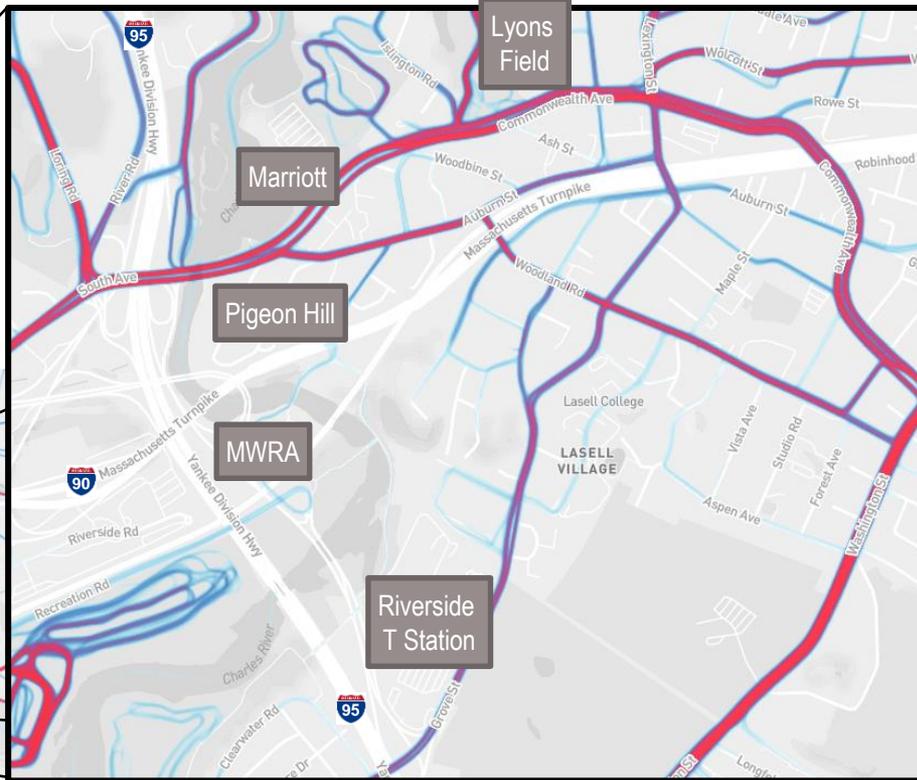
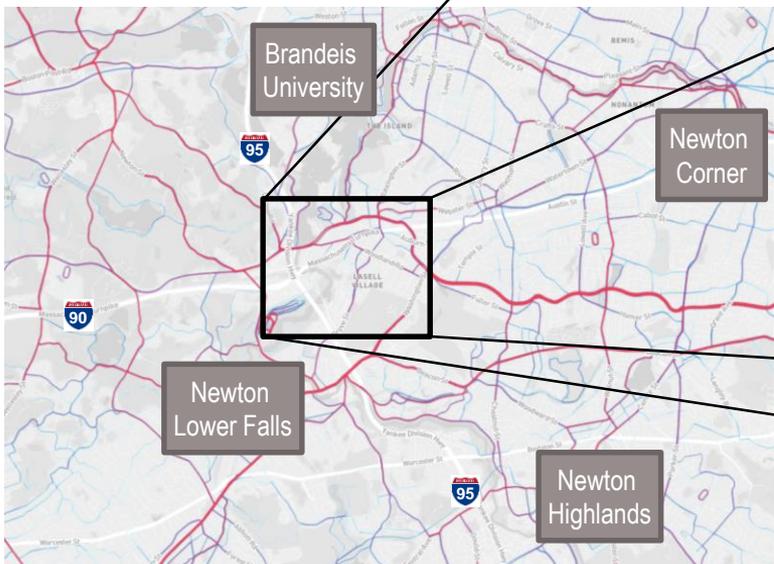


Origins/Destinations and Potential Users

These maps indicate the origins and destinations that the Greenway would connect, as well as the relative use that the existing corridors currently experience.

Anticipated users include:

- Residents
- Recreation/naturalists
- Marriott employees
- Through commuters
- MBTA commuters accessing Green Line at Riverside or Commuter Rail at Auburndale



Source: STRAVA Global Heat Map

Concurrent Projects and Related Work

Concurrent Projects

Two Bridges Trail Project

There will be a 25% design assessment of the two railroad bridges over the connector road and I-95 between the Riverside Station and Newton Lower Falls.

Pony Truss Path Restoration

The Appalachian Mountain Club in coordination with DCR is planning to restore the path on the eastern shore of the Charles River north of the Riverside MBTA Station.

MassDOT I-90 Bridge Rehabilitation, MassDOT Project #606783

The 2014 City of Newton Open Space and Recreation Plan notes that “when the Massachusetts Turnpike opened through Newton in 1964, it created a north/south divide in the City while also making portions of Newton more accessible by automobile.” Overcoming this obstacle is critical for the success of the Riverside Greenway. There is currently a project underway by MassDOT to widen and replace the deck of I-90 in the study area near Pigeon Hill. The project is in preliminary design.

Reconstruction of Pedestrian Bridge at Lasell Boathouse, MassDOT Project #609066

MassDOT is advancing the reconstruction of the bridge over the Charles River near the Lasell Boat House. (DCR owns the bridge.) This will facilitate crossing from Charles Street to the trail through the MWRA site that connects to Recreation Road. This project is in preliminary design.

Riverside Development

According to a 4/21/2018 *Boston Globe* article (link below), a 1.5 million square foot transit oriented development is being considered on the MBTA-owned land adjacent to the MBTA Riverside station and the hotel property directly to the west at the corner of Grove Street/Connector Road. The development would consist of housing, offices, shops, and hotel rooms. There is potential for the site to have its own access to I-95. Finding a way for the Riverside Greenway to connect to this site will be critical.

<https://www.bostonglobe.com/business/2018/04/21/developer-making-dramatic-changes-main-newton-corridor-one-property-time/BzHz211wyHe6Xi4J7k21IK/story.html>

Related Work

Several plans are relevant to the study area and were reviewed to ensure that the Riverside Greenway is consistent with local and regional planning initiatives. A summary of relevant aspects of each plan and project is provided in Section 2.3 of the Existing Conditions Memorandum in Appendix A. They include:

- 1998 Metropolitan District Commission’s Upper Charles River Reservation Master Plan
- 2007 Newton Comprehensive Plan
- 2014 City of Newton Open Space and Recreation Plan 2014-2020
- 2016 City of Newton Complete Streets Policy
- 2017 Newton Bicycle Plan (part of the 2017 Capital Improvement Plan FY2019-2023)
- 2017 Newton in Motion
- 2018 Newton Street Design Guide

Methodology

The Riverside Greenway Working Group led this study and provided direction for the study team. The Working Group is comprised of representatives from Bike Newton, Newton Conservators, the Newton neighborhoods local to the study area (Auburndale and Lower Falls), and the Solomon Foundation. The Working Group ensured that the study stays true to the project goals and reflects the spirit of Newton and the regional greenway network.

The first step in developing the Plan was to assess existing conditions to establish an understanding of the context in which the Riverside Greenway will be constructed. The existing conditions assessment documents cultural and natural resources, street operations, transit in the area, and bridges and underpasses, and is provided in Appendix A. Concurrently, the Historic Depot Tunnel was assessed to determine the repairs and cost necessary to reopen the tunnel to the public. This assessment is provided in Appendix B.

Next, possible routes for the Greenway were overlaid on the existing conditions to estimate any impacts that the Greenway would have on the area. The Working Group selected facility types for each segment and evaluated them against the Greenway goals to prioritize the segments and help develop a phasing plan for future projects.

On September 17, 2018, the study team held a public meeting to gather input and feedback on the Riverside Greenway. The meeting was a success and public response to the Greenway was overwhelmingly positive. The meeting notes are included in Appendix C.

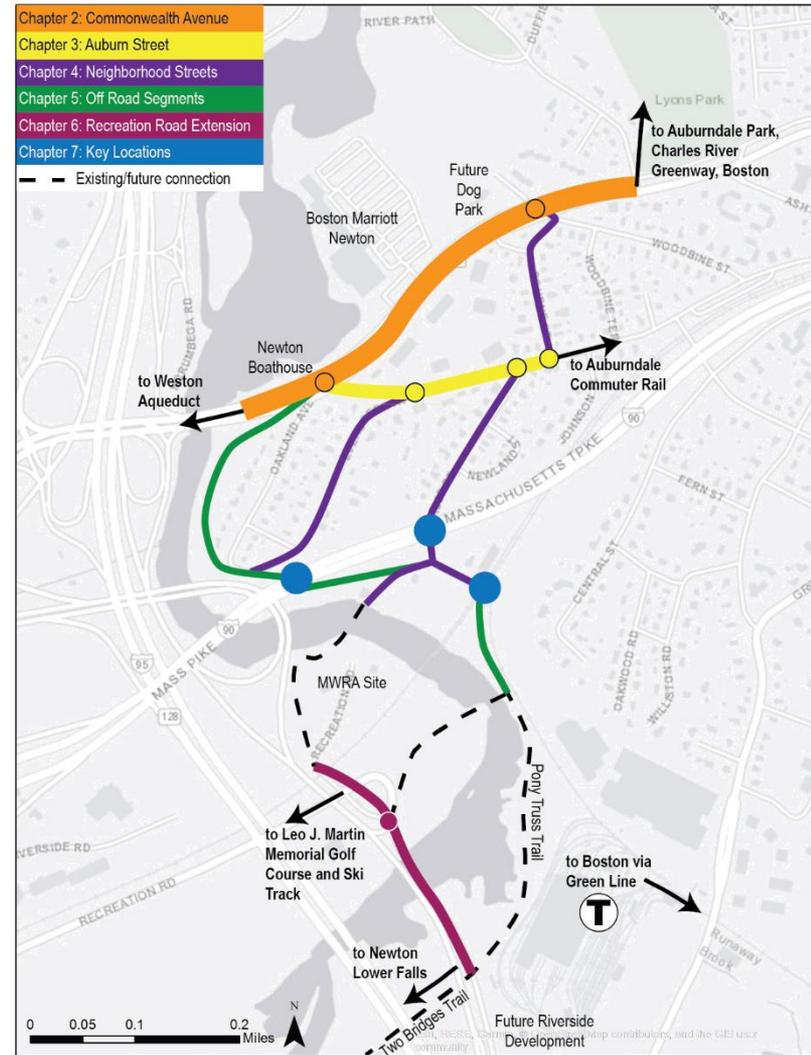
Resources

The *Newton Street Design Guide* and the *Newton Complete Streets Policy* provided the basis for recommendations for the on-street segments of the Riverside Greenway.



Chapter 2: Commonwealth Avenue

- A. Overview
- B. Cross-sections: Existing and Opportunities
- C. Key Intersections
 - Commonwealth Avenue at Woodbine Street
 - Commonwealth Avenue at Auburn Street
- D. Recommendations and Next Steps



Commonwealth Avenue Overview

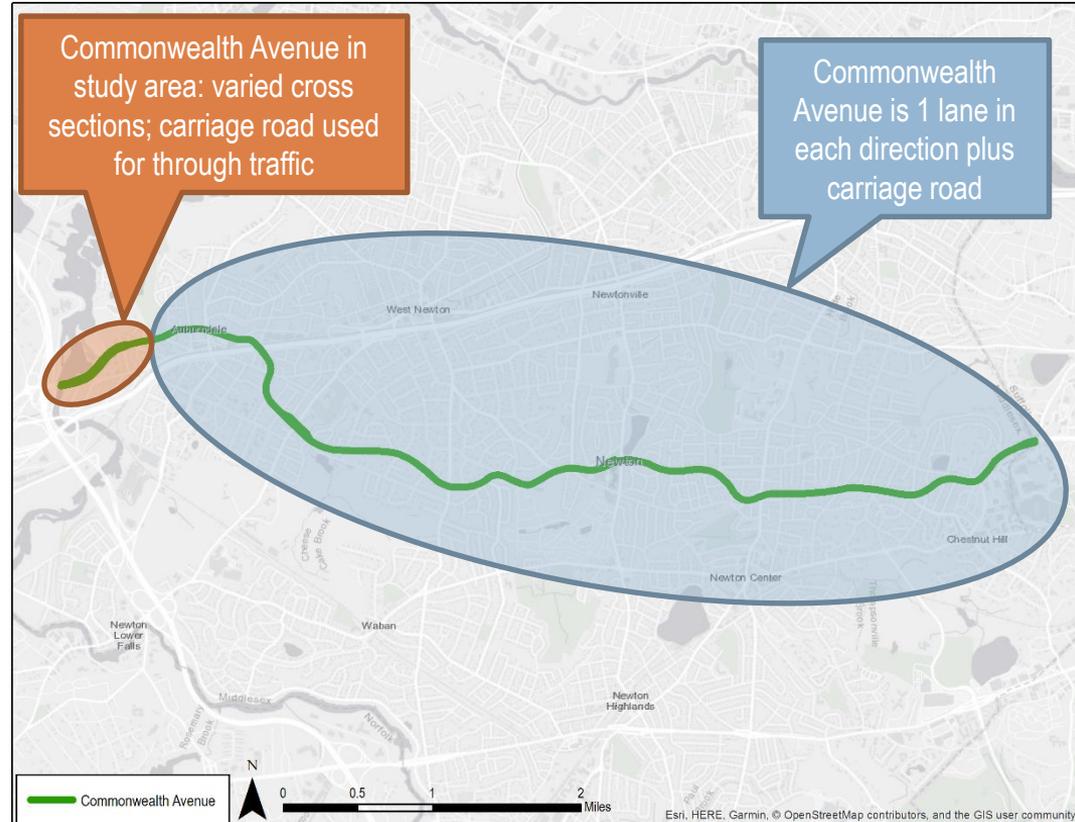
Commonwealth Avenue (also known as Route 30) is an arterial roadway under the City of Newton's jurisdiction. In the rest of Newton (east of the study area), Commonwealth Avenue is typically one through lane in each direction with a parallel "carriage road" that provides access to adjacent land uses and is much more welcoming to people walking or riding bikes.

In the study area between the Weston town line and Lyons Field, the Commonwealth Avenue cross section varies considerably as shown on the next page. The cross section bounces from two eastbound through lanes and one westbound through lane to one eastbound and two westbound, and departing from the "carriage road" treatment common throughout the rest of Newton. However, there are no major land uses or changes in travel patterns that would warrant such a departure from the typical cross section used on Commonwealth Avenue throughout the rest of Newton.

Moreover, the varied cross sections lead to confusing intersections, such as that at Auburn Street. There are no marked crosswalks across Commonwealth Avenue in the study area, sidewalks are intermittent, and there are no bicycle facilities.

Within study area:

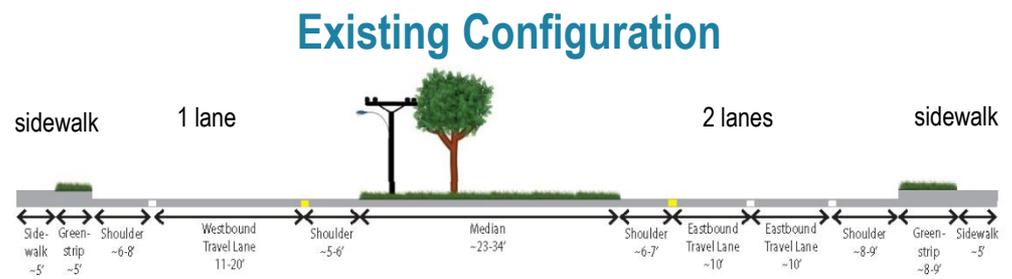
- Average Daily Traffic Volume (within study area): 18,653 vehicles
- Speed limit: 30-35 MPH
- Right-of-Way: ~120'



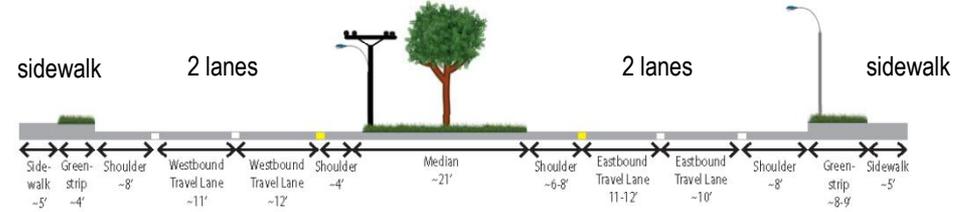
Commonwealth Avenue in Newton

Commonwealth Avenue Cross Sections within the Study Area (west to east)

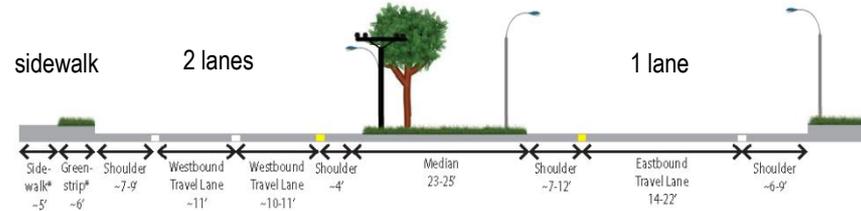
Auburn Street to Marriott



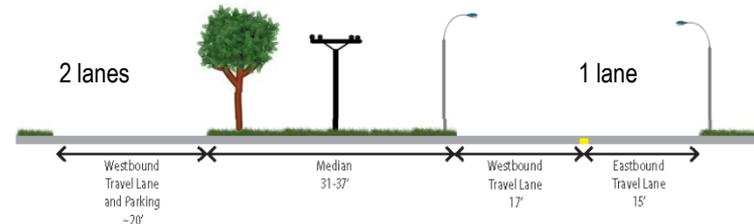
Marriott to conservation area



Conservation area to Woodbine Street



Woodbine Street to Islington Road



Commonwealth Avenue: Opportunities

The vision for Commonwealth Avenue put forth by the *Riverside Greenway Conceptual Plan* is one with a consistent cross section throughout the 2,000' study area segment. Given the existing traffic volumes, it is likely that a road diet could be applied and that one travel lane in each direction will suffice as it does on Commonwealth Avenue in the rest of Newton, but traffic modeling should be completed to confirm this concept.

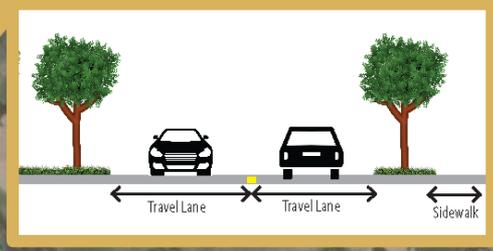
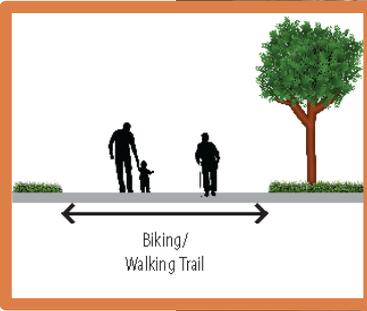
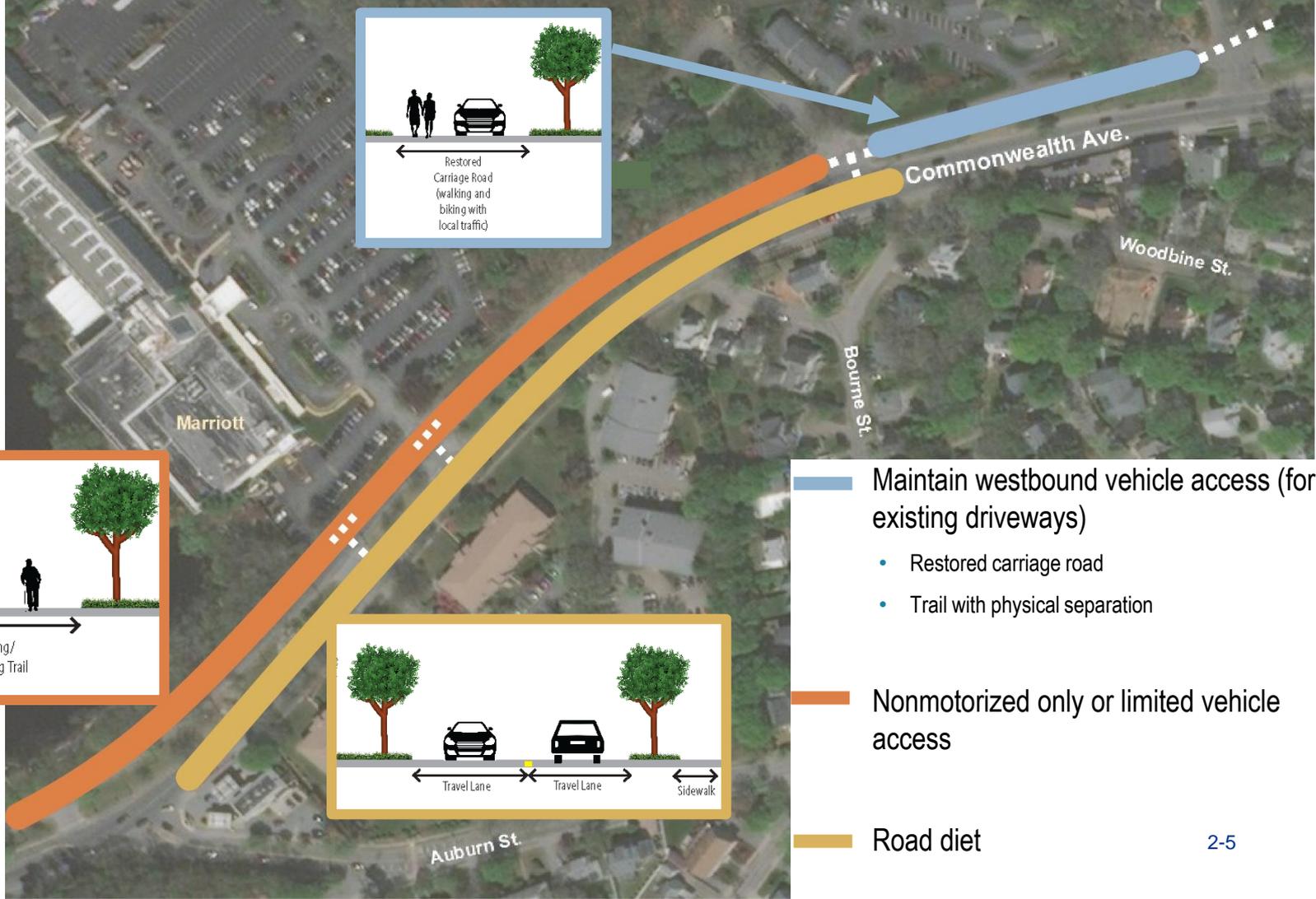
The concept for this cross section, described in greater detail on the following pages, eliminates having through traffic switch sides of the median and preserves the parallel carriage road for active transportation and the occasional low speed vehicle.

The proposed cross section also includes a continuous sidewalk on both sides of the Commonwealth Avenue right-of-way.



Carriage road along Commonwealth Avenue near Higgins and Lexington

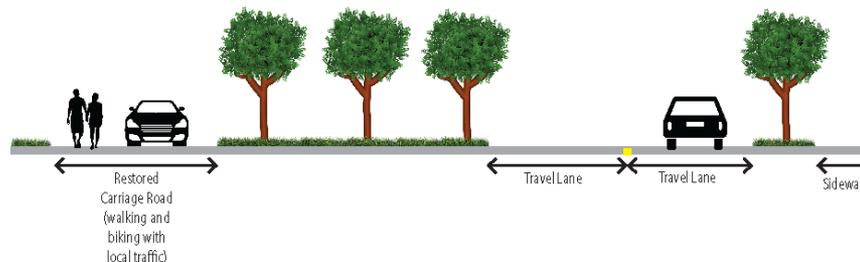
Commonwealth Avenue Opportunities



- Maintain westbound vehicle access (for existing driveways)
 - Restored carriage road
 - Trail with physical separation
- Nonmotorized only or limited vehicle access
- Road diet

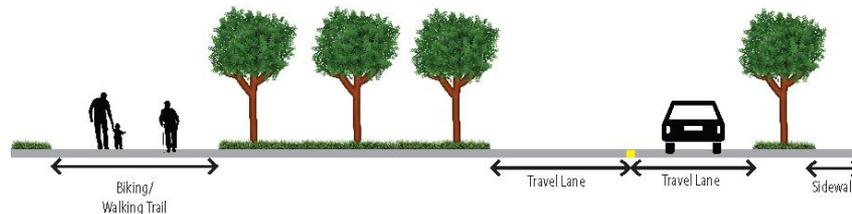
Commonwealth Avenue: Opportunities

Restore carriage road to a bike boulevard but for foot travelers as well as bikes



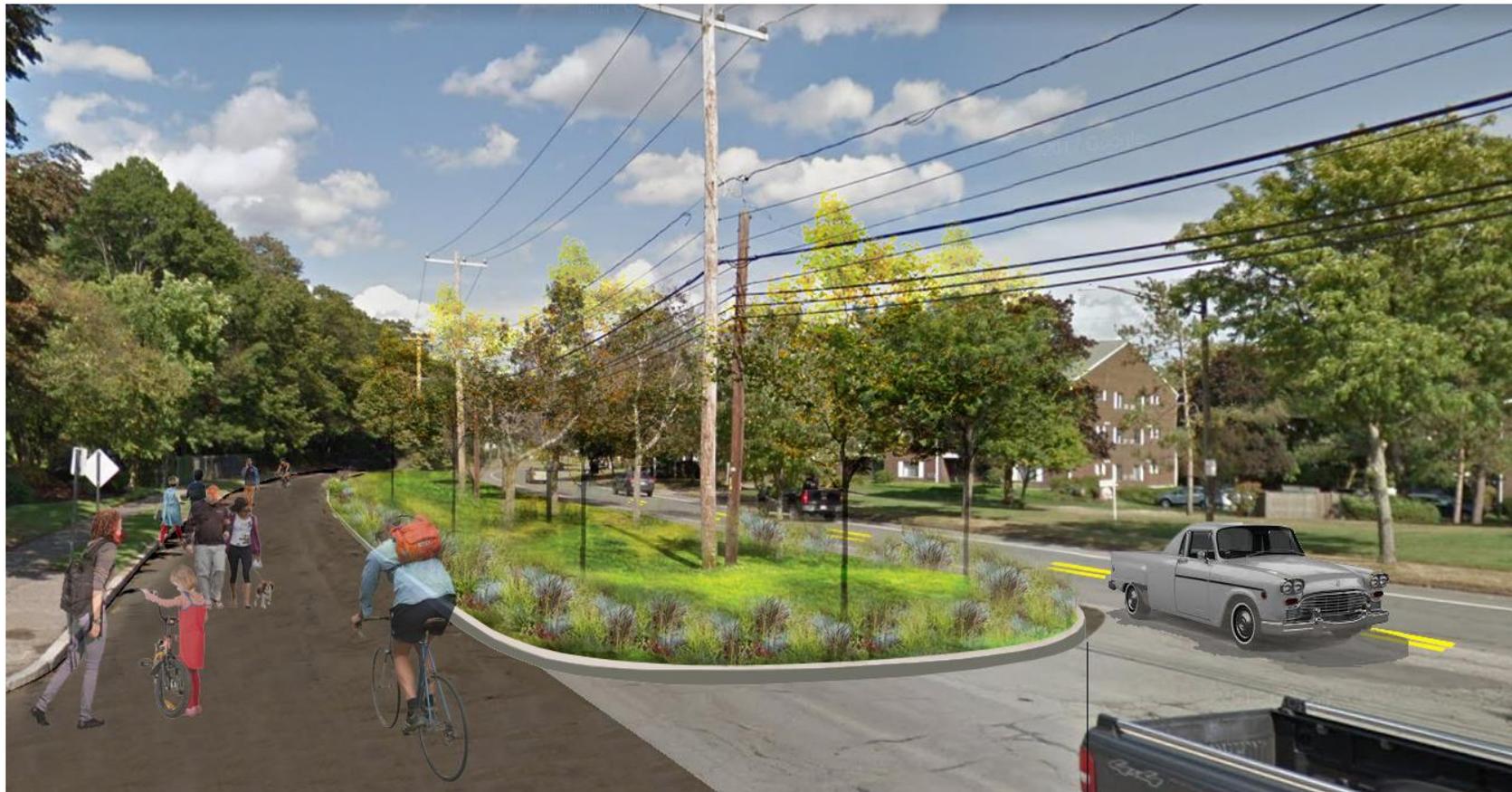
Non-motorized traffic only/
biking/walking trail

(Bike and foot traffic could be separated by pavement markings if desired)



A third alternative cross section for Commonwealth Avenue was considered but dismissed as described in Appendix C.

Commonwealth Avenue: Opportunities



14' Wide Biking / Walking Trail

Median: Variable Width, (~45')

11' Travel Lanes, 2' Buffer, 6' Sidewalk

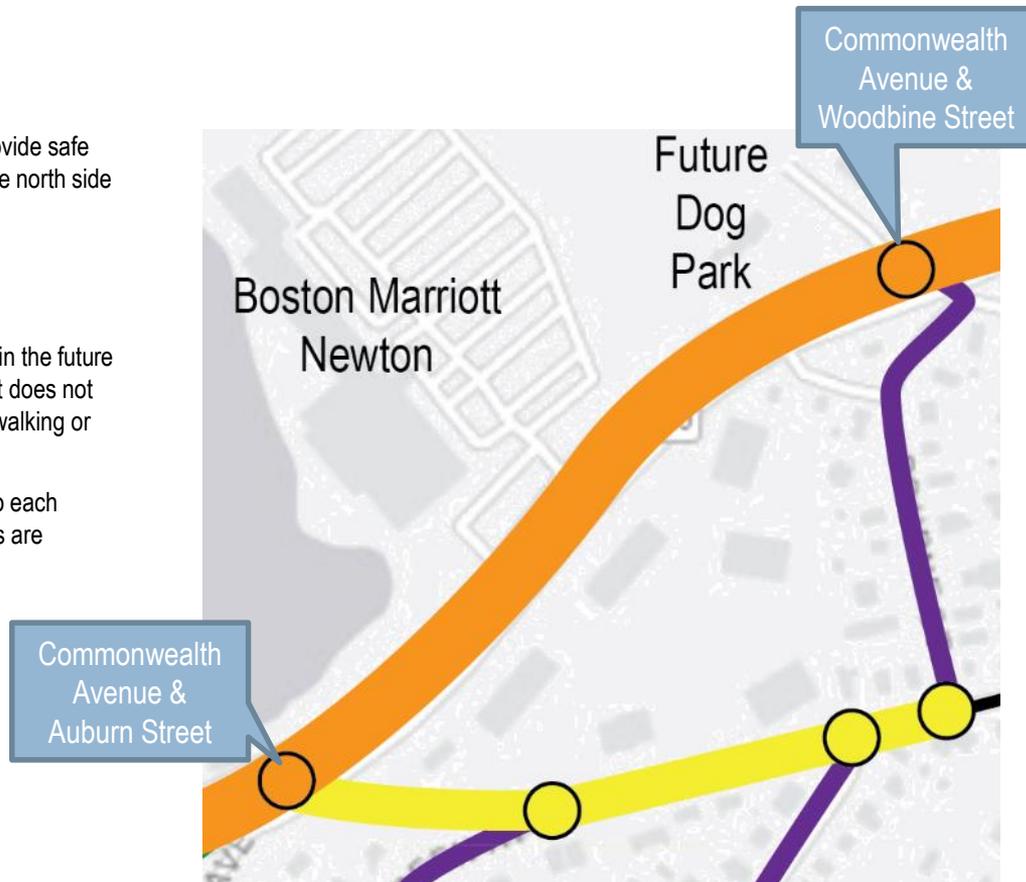
Intersections

Two intersections on Commonwealth Avenue will need to be improved to provide safe crossings for people walking and biking and to allow them to connect from the north side of the roadway to the rest of the Riverside Greenway on the south:

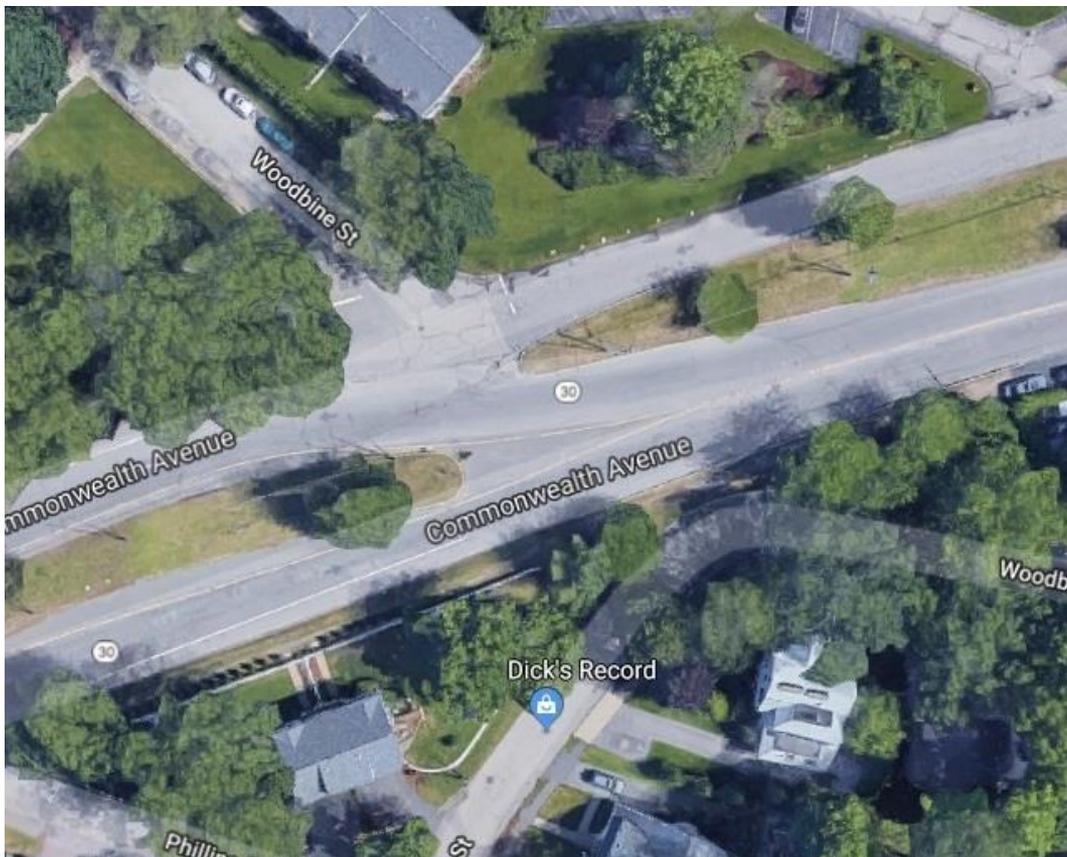
- Commonwealth Avenue & Woodbine Street
- Commonwealth Avenue & Auburn Street

In addition, the intersection at the Boston Marriott Newton should be studied in the future to identify potential improvements to safety and operations. However, since it does not involve a north-south connection across Commonwealth Avenue for people walking or biking, it is not considered in this study.

The following pages detail existing conditions and proposed improvements to each intersection, and assume that the recommended road diet and cross sections are applied to Commonwealth Avenue.



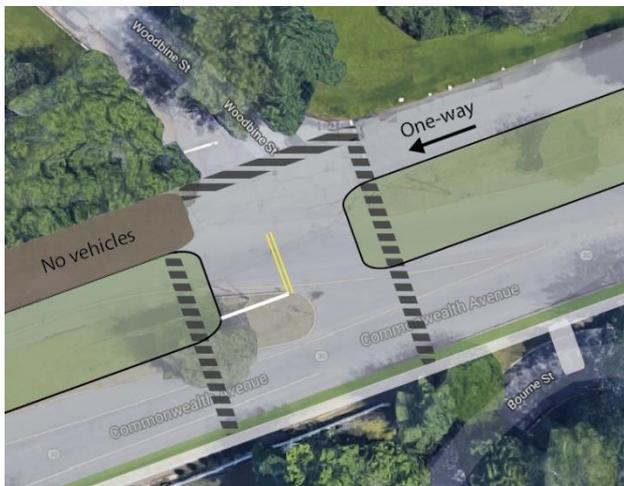
Commonwealth Avenue & Woodbine Street



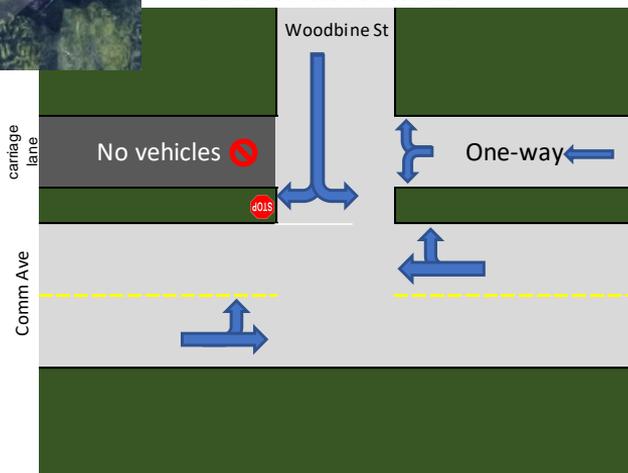
Existing Conditions

- Woodbine Street/minor approach is stop-controlled
- No marked crossings
- Southbound left turns are prohibited out of Woodbine Street
- Eastbound left turns onto Woodbine Street from Commonwealth Avenue are prohibited
- Carriage road is one-way westbound for through traffic
- Commonwealth Avenue is a framework street in the *Newton Street Design Guide*
- Woodbine Street is a non-framework street in the *Newton Street Design Guide*

Commonwealth Avenue & Woodbine Street



Vehicle Movements



Recommendations

- Reconfigure Commonwealth Avenue as recommended (road diet and carriage road)
 - East of intersection, restore carriage road for walking and biking and one-way local traffic
 - West of intersection, close carriage road to vehicular traffic and transform for walking/biking only
 - Through traffic to travel on south side of median: one-way in each direction
- Install crossing with enhancements (signage, high visibility markings, rectangular rapid flashing beacons (RRFBs))
- Traffic calming on Commonwealth Avenue on approach to crossing (if still needed after reconfiguration)
- Maintain existing one-way restriction on carriage road
- Consider permitting southbound and eastbound left-turns
- Include a sidewalk segment to directly connect to the future bike boulevard on Bourne Street (described in Chapter 5)

Commonwealth Avenue & Auburn Street



Existing Conditions

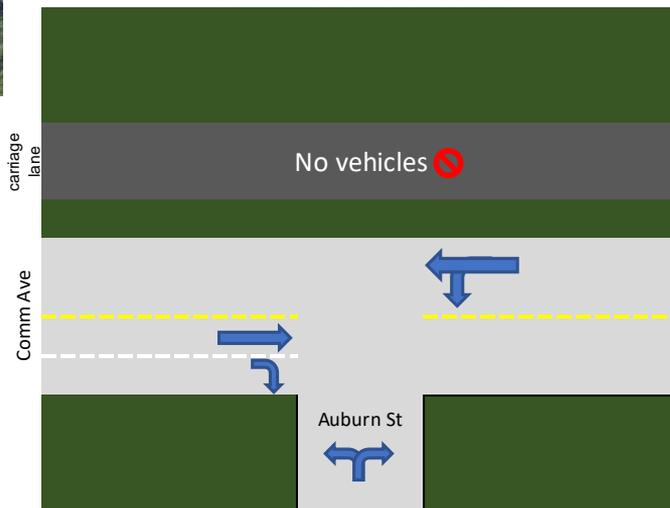
- Signalized, offset intersection
- No marked crossings
- Between 2013-2015 there were 5 crashes at this intersection*
 - 2 involved injuries (one of these was a pedestrian/bicyclist)
 - 2 were Property Damage Only
 - 1 was not reported
- Both Commonwealth Avenue and Auburn Street are framework streets

*Data source: MassDOT Crash Portal

Commonwealth Avenue & Auburn Street



Vehicle Movements



Recommendations

- Reconfigure Commonwealth Avenue as recommended (road diet and carriage lane)
 - Close carriage road to vehicular traffic and transform for walking/biking only
 - Through traffic to travel on south side of median: one-way in each direction, with an eastbound right-turn lane onto Auburn Street
- Realign intersection and reduce southwest corner radius
- Close opening in Commonwealth Avenue median
- Remove island on Auburn Street approach
- Install marked crossings
- Incorporate pedestrian phase into signal
- Maintain existing accesses to Oakland Ave and Boathouse

Recommendation and Next Steps

In the evaluation process (shown in Appendix E), applying a combination of the limited vehicle and no vehicle cross sections as shown on page 2-5 scored higher than allowing vehicles on the length of the carriage lane. This option includes making the improvements to the intersections at Woodbine Street and Auburn Street. A pre-requisite for this project is a study to confirm that a road diet is feasible to reduce Commonwealth Avenue from three lanes to two in this segment.

The next steps to implement this project are

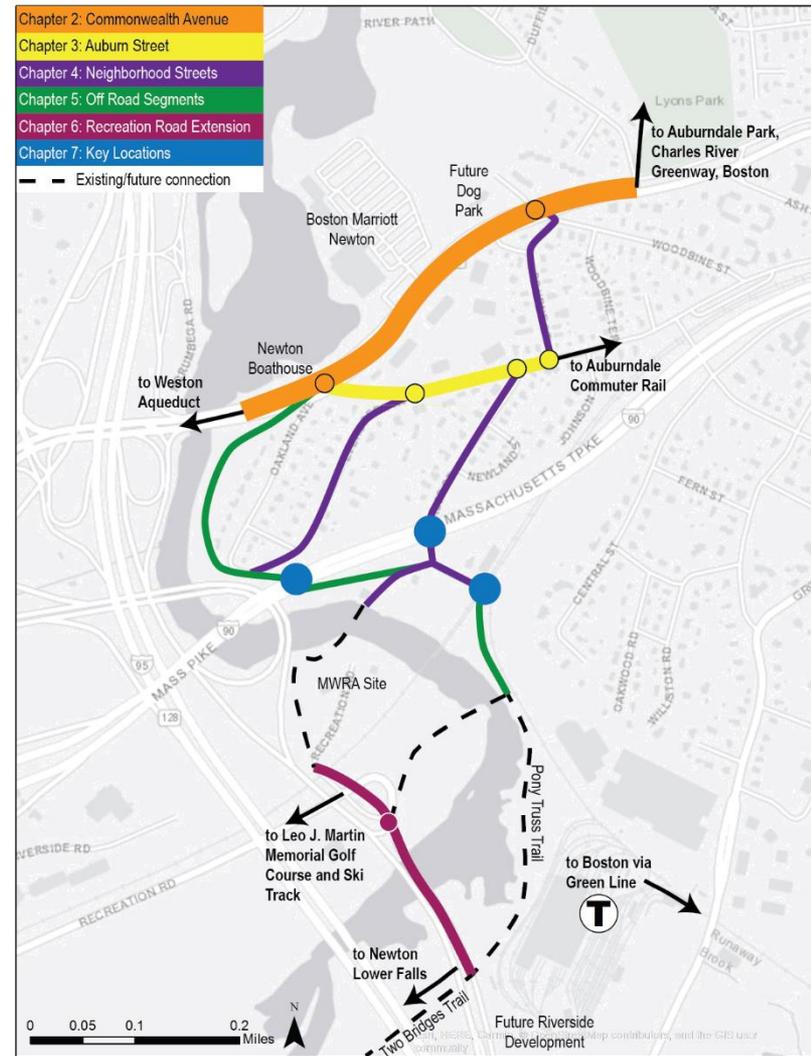
- Work with the City of Newton to initiate this project (starting with a road diet analysis) and to coordinate with other projects in the area (specifically, the Dog Park)
- Coordinate with the Boston Marriott Newton as an abutter
- While some access permits may be necessary, no other permits are anticipated at this time

Potential Funding Sources

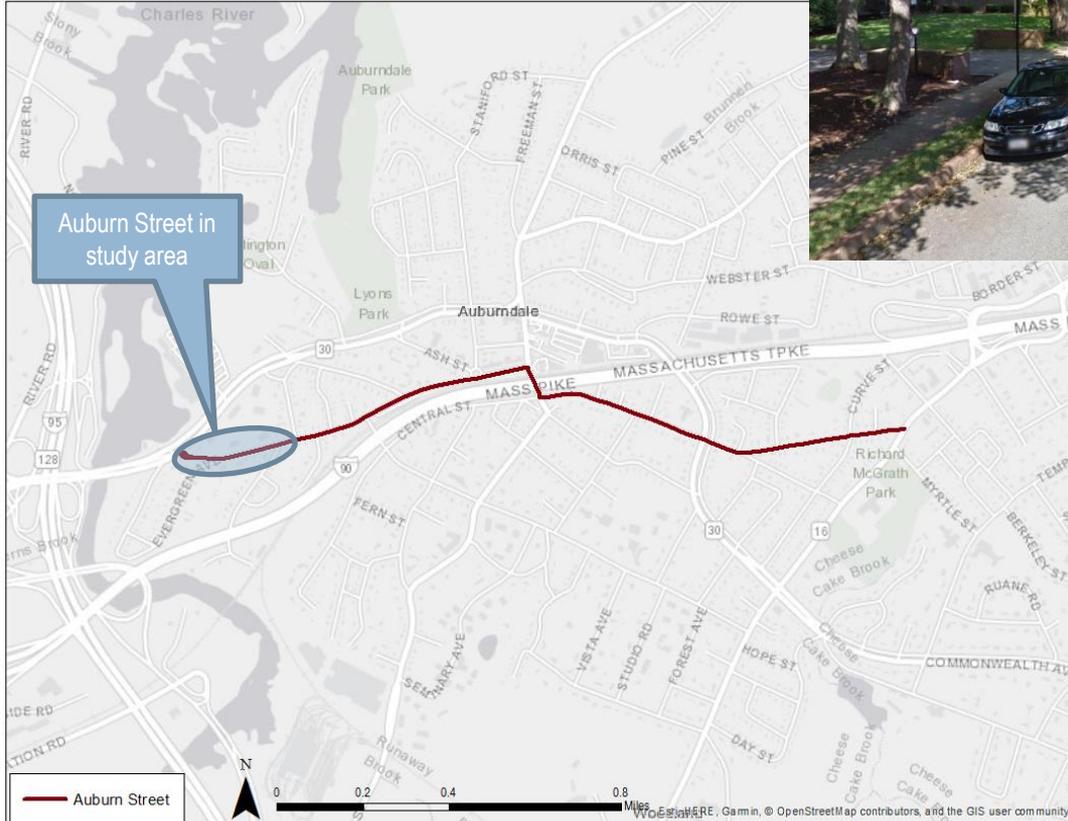
- TIP
- Newton Capital Budget
- MassTrails

Chapter 3: Auburn Street

- A. Overview
- B. Cross-sections: Opportunities
- C. Key Intersections
 - Auburn Street at Bourne Street
 - Auburn Street at Charles Street
 - Auburn Street at Evergreen Avenue
- D. Recommendations and Next Steps



Auburn Street Overview



Auburn Street is a collector road under the City of Newton's jurisdiction. Within the study area (between Commonwealth Avenue and Bourne Street), its cross section consists of approximately 32' curb-to-curb width with two travel lanes and intermittent on-street parking. The right-of-way width is approximately 50'. Traffic volume data were unavailable for this study. The posted speed limit is 30 MPH.

Between Commonwealth Avenue and Evergreen Avenue, there is a sidewalk on the north side of the street, and on-street parking is prohibited.

Between Evergreen Avenue and Bourne Street, there are sidewalks on both sides of the street, buffered from the roadway with a narrow green strip. In this section, on-street parking is permitted on the north side of the street, but not on the south side.

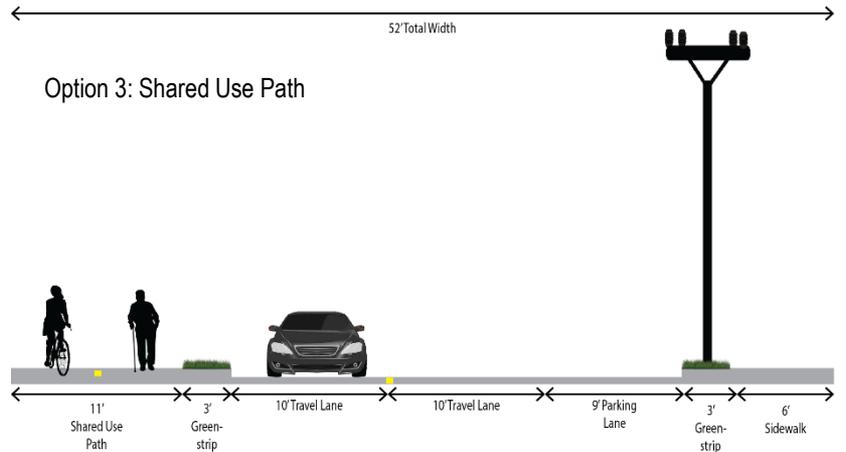
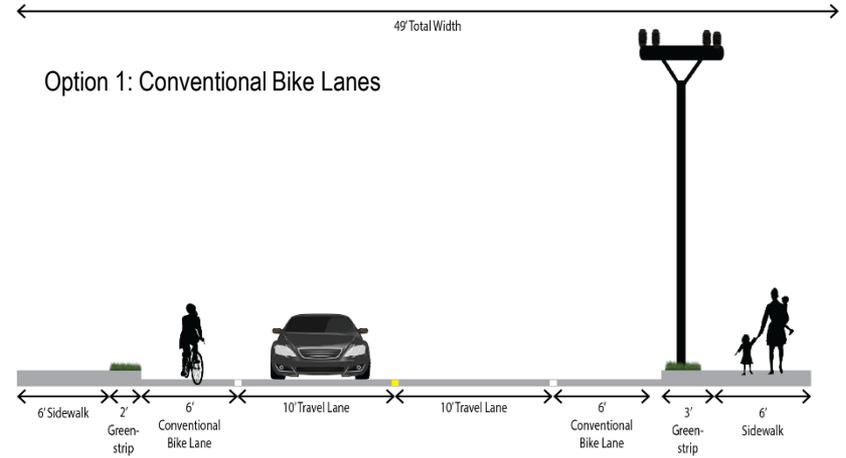
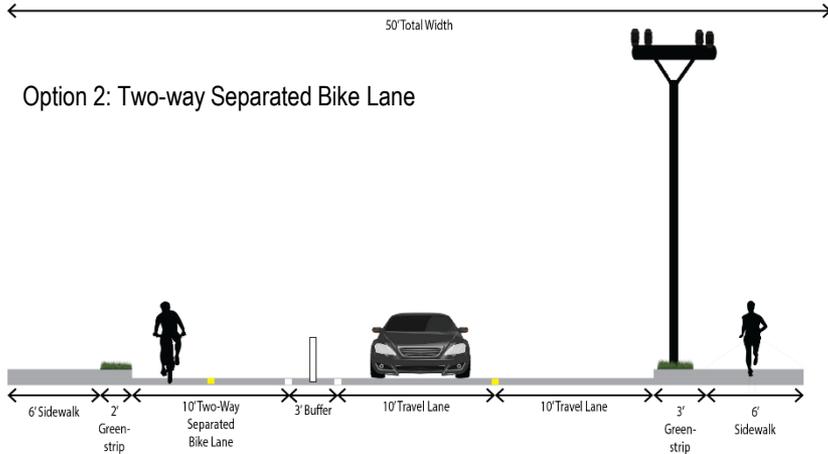
There is a raised crossing at Evergreen Avenue.

Cross Sections

The cross sections on this page illustrate alternative configurations for Auburn Street to provide an active transportation connection for the Riverside Greenway. All the cross sections have been developed following with the *Newton Street Design Guide*.

The conventional bike lane option could be accomplished with minimum construction, fitting within the 32' pavement width. Options 2 & 3 would require reconstruction to move the curb and relocate utilities. On-street parking would need to be eliminated in Options 1 & 2, but is maintained in Option 3.

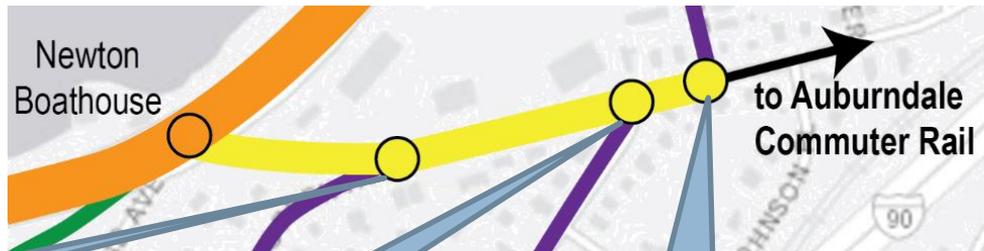
Although the geographic scope of this plan ends at Bourne Street, any treatment could likely be extended all the way to the Auburndale Commuter Rail Station.



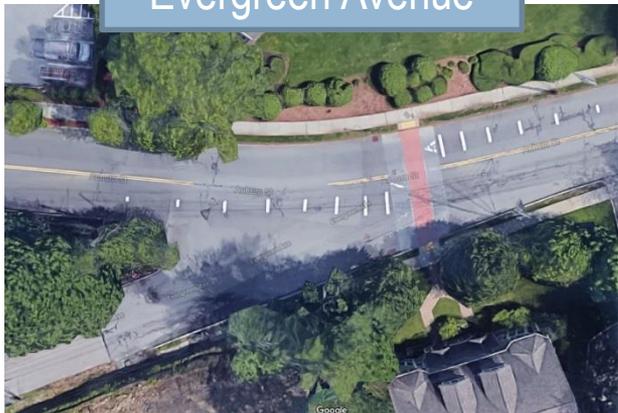
Intersections

There are three intersections on the study segment of Auburn Street: from west to east, Evergreen Avenue, Charles Street, and Bourne Street. (The Commonwealth Avenue intersection is discussed in Chapter 2.) At each of these intersections, the minor approaches are stop-controlled and traffic on Auburn Street has the right-of-way.

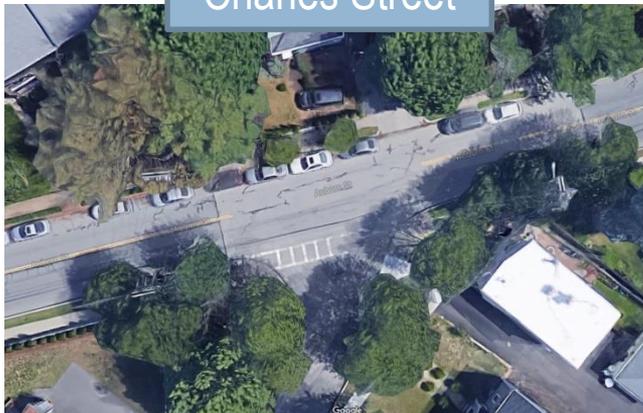
Most importantly, the only crossing across Auburn Street within the study area is at Evergreen Avenue. This is a well-marked, raised crossing. However, there are no crossings across the minor approaches at the Evergreen Avenue and Bourne Street intersections.



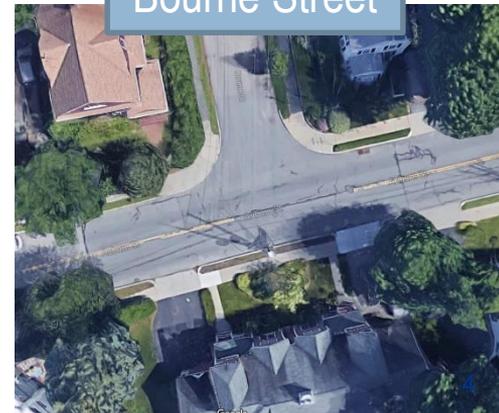
Evergreen Avenue



Charles Street



Bourne Street



Intersections: Auburn Street and Evergreen Avenue



Recommendations

- Keep raised crossing
- Install marked crossing on Evergreen Avenue
- Reduce corner radius on southeast corner to slow vehicle speeds and shorten crossing distance

Intersections: Auburn Street & Charles Street



Recommendations

- Install raised crossings on both Auburn Street and Charles Street
- Reduce corner radius on southeast corner to slow vehicle speeds and shorten crossing distance

Intersections: Auburn Street & Bourne Street



Recommendations

- Install raised crossings on Auburn Street
- Reduce corner radii on Bourne Street to slow vehicle speeds and shorten crossing distance

Recommendation and Next Steps

In the evaluation process (shown in Appendix E), Option 1 (conventional bike lanes) scored slightly higher than Options 2 & 3, likely because it doesn't involve as many impacts and is easier to implement because it fits within the 32' curb-to-curb width. A project to restripe Auburn Street and make the recommended improvements to each intersection would provide an active transportation connection between Commonwealth Avenue and eventually the Auburndale Commuter Rail Station. It would also facilitate crossing Auburn Street to link the bike boulevards described in Chapter 4.

The next steps to implement this project are

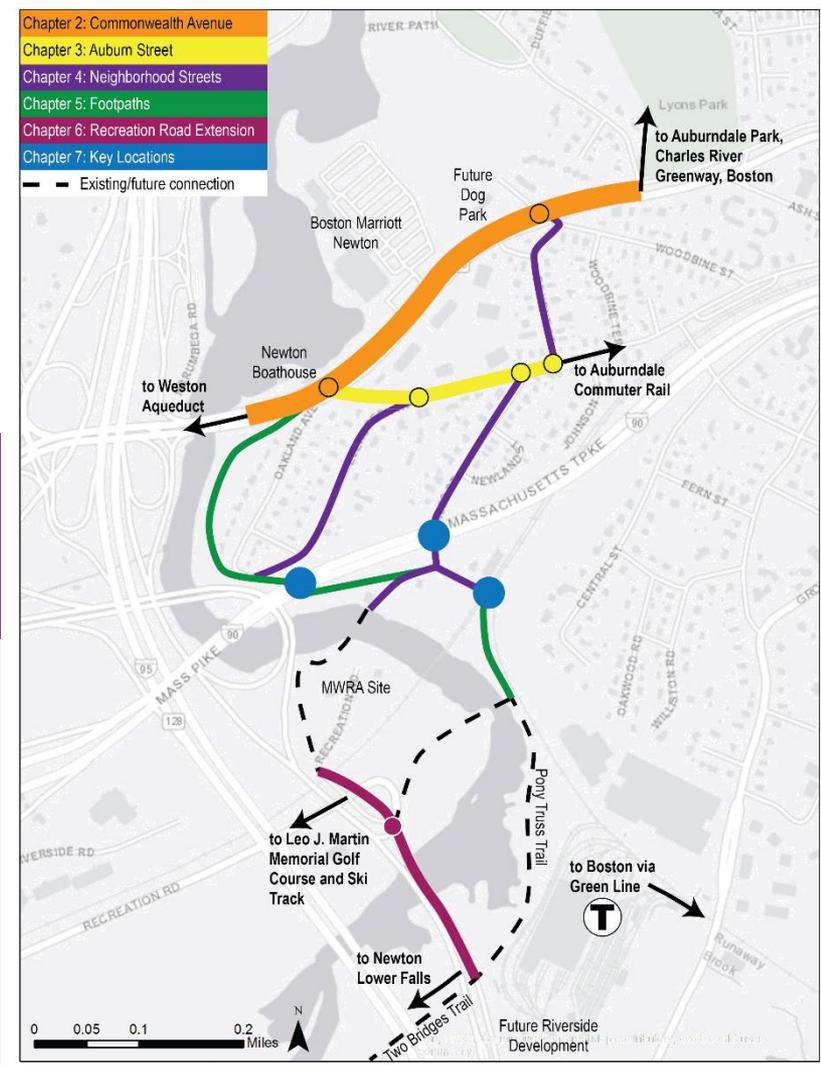
- Work with the City of Newton to initiate this project
 - A public process to approve removal of the on-street parking might be necessary
 - The bike lane striping might be able to be accomplished during regular maintenance activities
- No permits are anticipated at this time

Potential Funding Sources

- TIP
- Newton Capital Budget
- MassTrails

Chapter 4: Neighborhood Streets/ Bike Boulevards

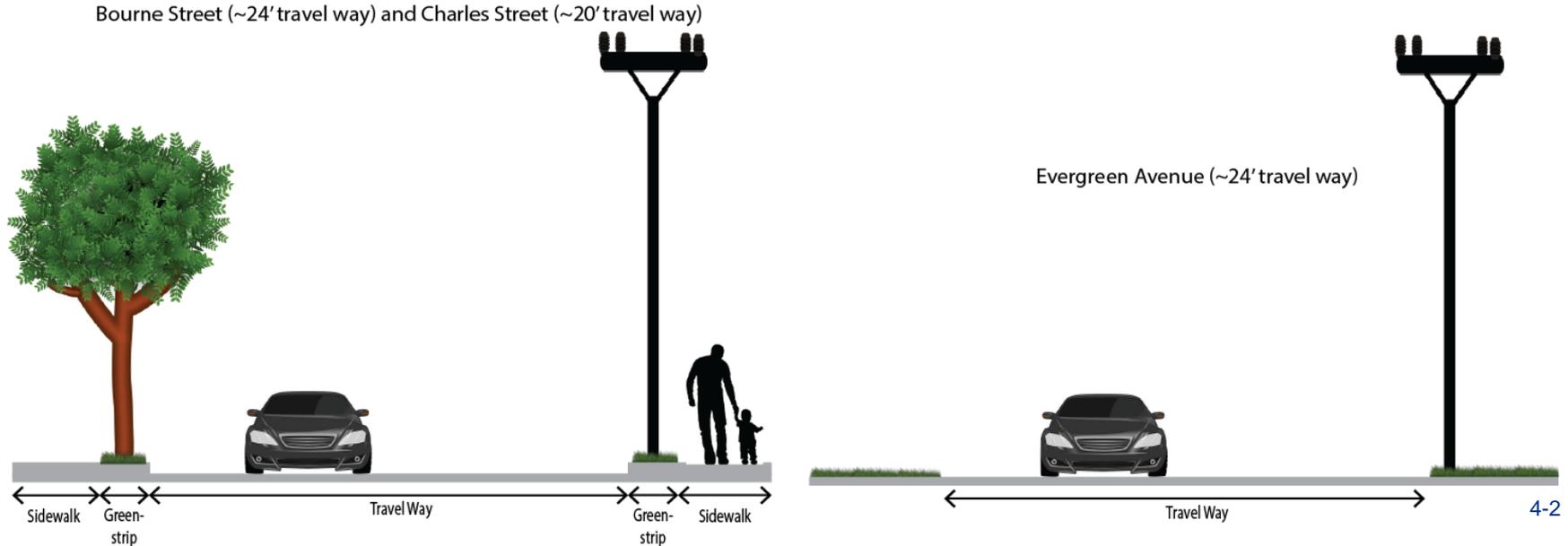
- A. Bourne and Charles Streets, Evergreen Avenue
- B. Proposed Treatment
- C. Recommendations and Next Steps



Neighborhood Streets: Bourne and Charles Streets, Evergreen Avenue

The Pigeon Hill neighborhood comprises a significant part of the study area. Its residents have minimal access to the Charles River except for the DCR property on Charles Street. Moreover, they have little opportunity to walk or bike to the multitude of recreation opportunities and destinations north of Commonwealth Avenue or to the Riverside MBTA Station.

The Pigeon Hill neighborhood and its streets present a significant link in the Riverside Greenway. These streets are low volume and low speed, offering attractive opportunities for creating active transportation connections as described on the next page. The existing cross sections are shown below.



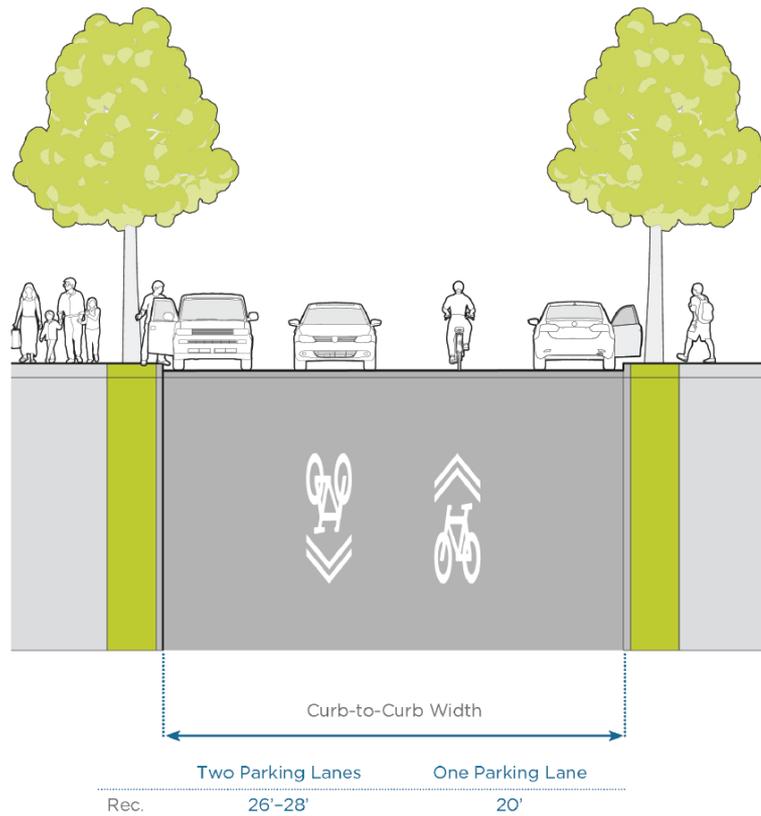
Proposed: Bike Boulevard

The *Newton Street Design Guide* presents the Bike Boulevard concept (shown to the right), which could be applied to the neighborhood streets of Pigeon Hill. This concept involves little infrastructure to implement, consisting mostly of signage and pavement markings. In cases where drivers are travelling at speeds that are unsafe for the context, additional traffic calming measures (such as chicanes or other horizontal deflection) can be applied. Since these neighborhood streets are not Framework Streets as described in the *Newton Street Design Guide*, vertical deflection options can be considered as well.

Additional treatments (described in Appendix C) for the intersections of Charles Street & Riverside Road and Bourne Street & Phillips Street were considered but dismissed.

Figure 4.7 Bike Boulevard

Bike boulevards are low-volume, low-speed streets—typically local streets—that have been designed to prioritize bicycle travel with signs, pavement markings, traffic calming measures (see **Section 4.3**), and, at major crossings, enhanced crossing treatments.



Recommendation and Next Steps

Bike boulevards on neighborhood streets are likely the easiest project to implement in the *Riverside Greenway Conceptual Plan*, as they are already well defined in the *Newton Street Design Guide* and require very little infrastructure to construct.

To install Bike Boulevards on Bourne and Charles Streets and Evergreen Avenue:

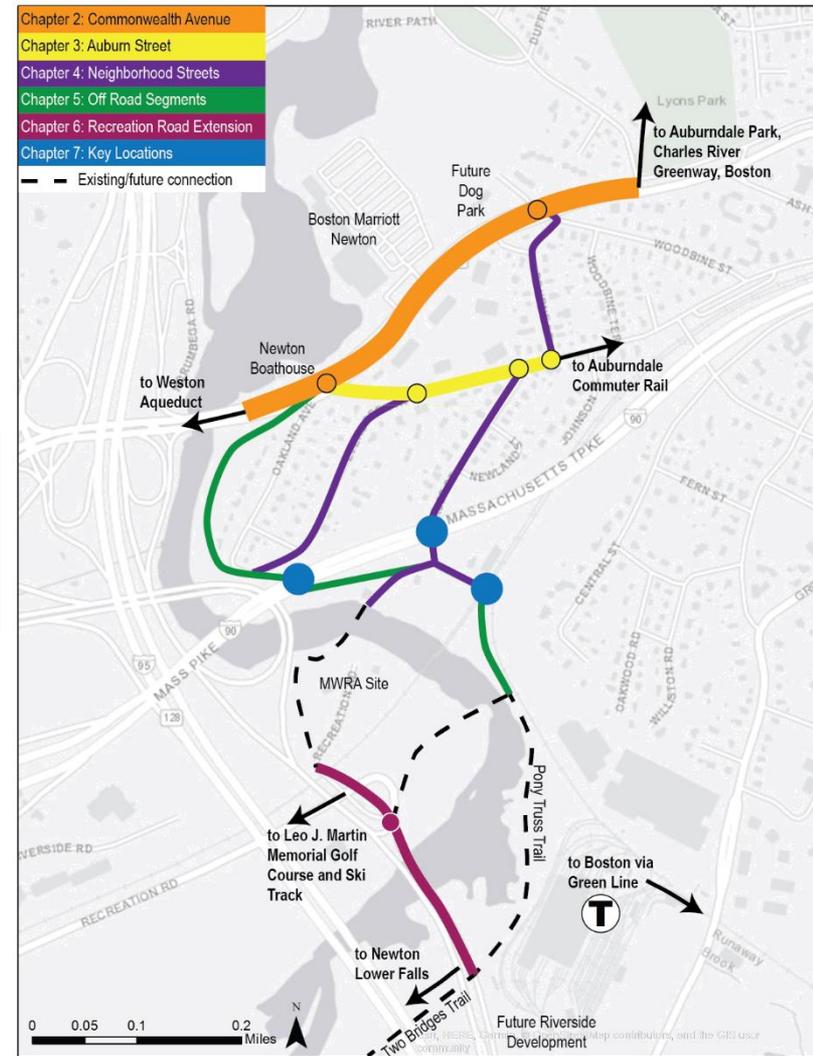
- Work with the City of Newton to add a line item to the capital budget for signs and pavement markings
- Hold neighborhood meetings to share the idea with abutting property owners and gather feedback
- No permits are anticipated at this time

Potential Funding Sources

- Newton Capital Budget

Chapter 5: Off Road Segments

- A. Overview
- B. West of Pigeon Hill
- C. Pigeon Hill Trail
- D. Depot Tunnel to Riverside Park Footbridge
- E. Recommendations and Next Steps



What is “Off Road”?

Among the primary goals of the Riverside Greenway are to improve 1) access to the river and 2) circulation and open space connections along the river corridor. Facility types that could be used to accomplish these goals include: shared use paths, walking/biking trails, and rustic hiking trails or footpaths.

Shared use paths and walking/biking trails are shared by all users and are ADA accessible, whereas footpaths are only accessible to hikers/runners. Aside from this main distinction, the design differences between these facility types are the surface type (paved, crushed stone, or natural/unimproved) and width (wide/10'+ or narrow/2-3').

Another primary goal of the Riverside Greenway is to limit potential conflicts between activities. Footpaths accomplish this by not accommodating bicycling. Walking/biking trails limit conflicts because their unpaved surface prevents bicyclists from travelling at high speeds. However, walking/biking trails are still ADA accessible because they are designed to have stable surfaces and do not exceed grades that would prevent travel with a mobility assistive device. Shared use paths are typically paved and ADA accessible.

Another off-road facility type that was considered but dismissed was a shoreline boardwalk, as described in Appendix C.

Shared use path



Footpath



Walking/biking trail



Off Road Segments

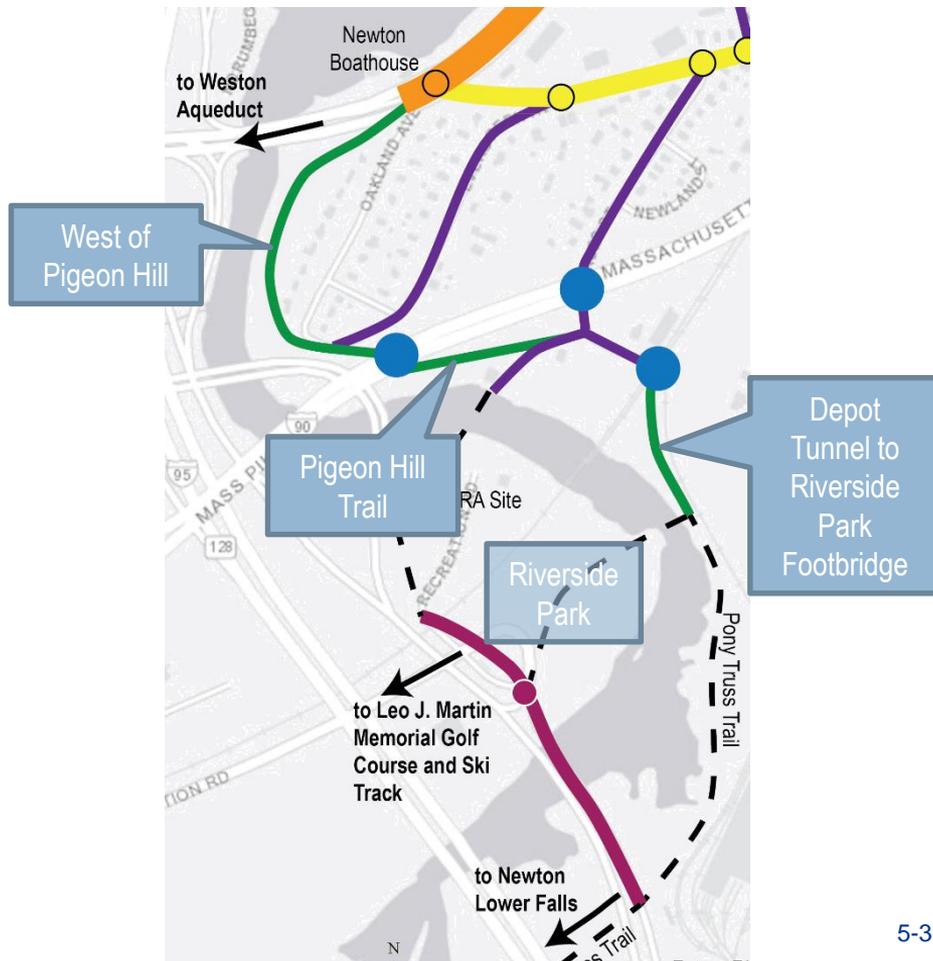
Three segments of the Riverside Greenway are off road:

- West of Pigeon Hill
- Pigeon Hill Trail
- Depot Tunnel to Riverside Park Footbridge

As noted in Chapter 7, some of the key locations that involve overcoming the barriers in the study area overlap with these segments, specifically, the I-90 Underpass and the Depot Tunnel, which are discussed in Chapter 7.

West of Pigeon Hill

Between the Charles River and the homes on the west side of Oakland Avenue, a footpath can be established from Commonwealth Avenue along and up the slope to the top of Pigeon Hill, meeting with the Evergreen Avenue Bike Boulevard and the Pigeon Hill Trail (described on the next page). This would be a rustic hiking trail much like the existing Pony Truss Trail. The trail would follow the contours of the slope, getting gradually steeper as it rounds the southern bend near I-90.



Pigeon Hill Trail

The Pigeon Hill Trail follows the alignment of the old Pigeon Hill Road. The old roadway alignment drops about 30' in elevation over approximately 500' for a 6% grade. Integrating level intervals over this distance would ensure that it is ADA accessible. Little clearing would need to be done to complete this segment as the old roadway bed is still in place. This segment would be a shared use path (paved).

The Pigeon Hill Trail meets the footpath on the west side of Pigeon Hill, passes under I-90, and runs roughly parallel to the MassPike down to where Riverside Road meets Charles Street (top right). During the design phase, care should be taken to encourage bicyclists to travel down the slope at safe speeds, as they will meet a sharp bend at the bottom of the hill.

At the bottom of the Trail, Greenway users could head southeast on Riverside Road (recommended for a Bike Boulevard) towards the Lasell College Boathouse. The footbridge across the river at the boathouse (bottom right) is going to be reconstructed by MassDOT, and connects to the paved shared use path at the MWRA site, which ultimately meets Recreation Road Extension.

Alternatively, once reaching the bottom of the Pigeon Hill Trail, Greenway users can continue southwest on Charles Street (also recommended for a Bike Boulevard) to the Depot Tunnel. After passing through the tunnel, users would pick up the segment described on the next page.

A key location along the Pigeon Hill Trail is the I-90 underpass, which is described in Chapter 7.

Riverside Road looking east towards Charles Street. The MassPike is on the top of the slope on the left (a 55MPH speed limit sign can be seen). The Old Pigeon Hill Road is on this slope between Riverside Road and the MassPike.



Footbridge between the Lasell Boathouse and the MWRA site, to be reconstructed by MassDOT.

Depot Tunnel to Riverside Park Footbridge

As part of this study, the structural integrity of the Depot Tunnel under the MBTA Commuter Rail Tracks was evaluated to determine the feasibility of reopening it. The assessment is provided in Appendix D and determines that it is feasible to open the tunnel to the public. The tunnel is discussed in detail in Chapter 7.

On the south side of the tunnel, the Pony Truss Trail extends along the Charles River to Recreation Road Extension, the Two Bridges Trail, and the MBTA Riverside Station. The trail is a rustic footpath as shown to the right. Less than 600' south of the tunnel, the Pony Truss Trail is intersected by a newly constructed footbridge which travels over the Charles River to Riverside Park and its shared use paths. As it stands now, coming from Riverside Park, the footbridge doesn't really connect to a meaningful Greenway facility, and certainly not an ADA accessible one. The segment of the Pony Truss Trail between the Depot Tunnel and the Riverside Park Footbridge includes remnants of pavement and stairs from when this area was a heavily used recreation center. This segment drops about 23' in elevation over approximately 500' for a 5% grade.

Since this trail already exists, the proposed project evaluated as part of the Riverside Greenway is for converting the segment between the Depot Tunnel and the Riverside Park Footbridge to a bike/walk trail. This would complete an ADA-accessible loop through Riverside Park and the MWRA site and the DCR park at 107 Charles Street.



The Pony Truss Trail (right) between the Depot Tunnel and the footbridge to Riverside Park.



Footbridge between Pony Truss Trail and Riverside Park.

Recommendation and Next Steps

The evaluation process for these three concepts is shown in Appendix E. The next steps for implementation are:

- West of Pigeon Hill
 - Hold neighborhood meetings to share the concepts with abutting property owners and gather feedback
 - Coordinate with Newton Conservation Commission
 - Obtain survey and confirm property boundaries/ownership
 - Coordinate access with land owners (Commonwealth of Massachusetts)
- Pigeon Hill Trail
 - Develop 25% designs (based on MassDOT design standards for shared use paths)
 - Work with MassDOT to potentially add this project on to an existing MassDOT project (like reconstruction of the Lasell College footbridge)

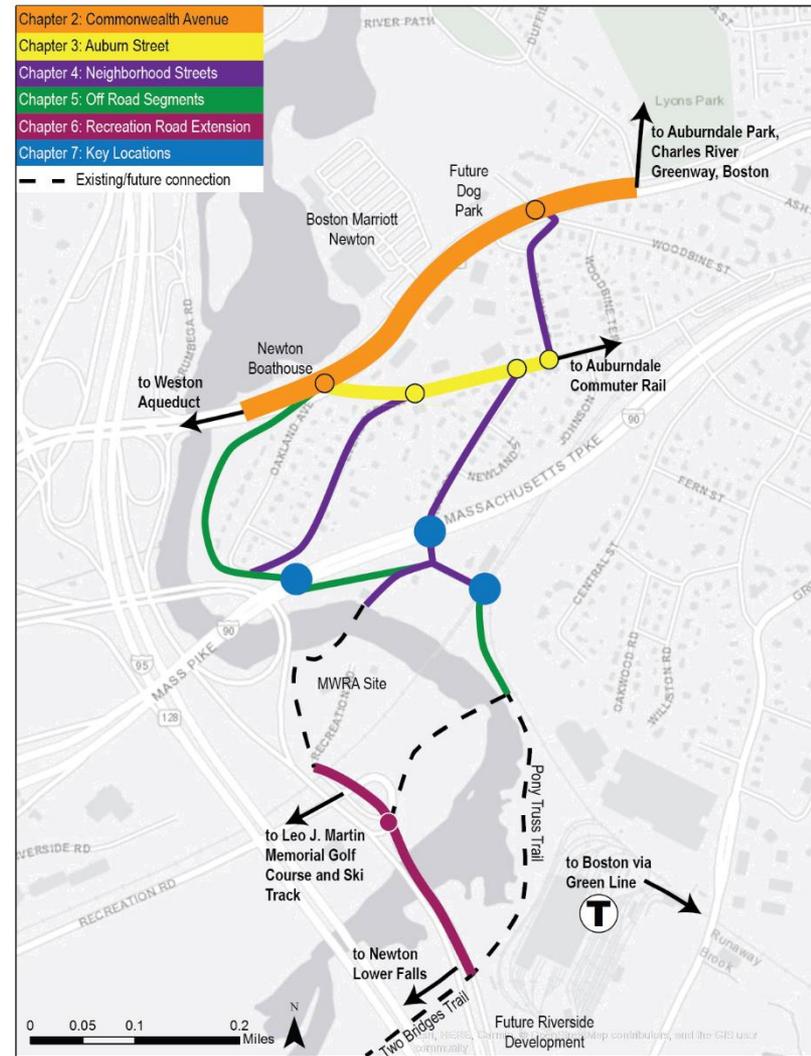
- Depot tunnel to Riverside Park Footbridge
 - Work with DCR to coordinate this project with the Depot Tunnel project (Chapter 7)
 - Changes to the Pony Truss Trail might trigger wetland and water resource permits

Potential Funding Sources

- Appalachian Mountain Club grants
- MassTrails
- MassDOT
- DCR
- Private grants

Chapter 6: Recreation Road Extension

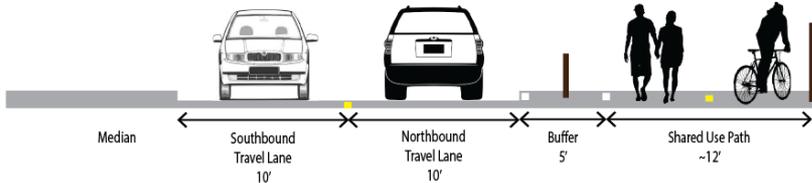
- A. Overview and Envisioned Cross-section
- B. Connecting to MWRA Path
- C. Recommendations and Next Steps



Overview

The Recreation Road Extension segment of the Riverside Greenway (shown highlighted in yellow on the right) is closely tied to the future Riverside development. The Riverside development is located on the site of the Hotel Indigo and the MBTA Riverside Station Parking. This section of the Greenway connects the MWRA site and Riverside Park with the Pony Truss Trail, the future Two Bridges Trail, and the Riverside MBTA Station.

The Riverside developer has been working with MassDOT on changes to the cross section of Recreation Road Extension (also known as the connector road), which would include facilities for active transportation. The Riverside Greenway Working Group envisions the typical section shown below for the Recreation Road Extension and has discussed this with the Riverside developer. Given this section's history as the old Route 128 alignment, this former limited access roadway will require special design details and visual cues to promote safe vehicle speeds.



At the southern end of this segment, the Two Bridges Trail (currently in design) will include ways of connecting down the grade to the Recreation Road Extension, the Riverside MBTA Station, and the Riverside development. At the northern end, the facility will need to tie into the existing paths at the MWRA site and Riverside Park via an approximately 30' wide driveway. Configuration of this driveway must maintain vehicle access, but should also improve legibility of bicycle and pedestrian paths. It may also be able to accommodate additional parking for trail access.



Connecting at the northern end of Recreation Road Extension

Making the connection from the Recreation Road Extension to the rest of the Riverside Greenway to the north presents a couple of design challenges. The first is avoiding conflicts between people walking/biking and vehicles travelling on Recreation Road to keep everyone safe. The second is negotiating the grades in the area to ensure that the active transportation facility is accessible to all users.

Three options have been considered in this plan:

1. Staying on the east/north side of the roadway and using switchbacks to descend to the MWRA site
2. Developing a “SLOW ZONE” at the Riverside Park trailhead to enable people crossing Recreation Road
3. Crossing Recreation Road at the MWRA driveway and making additional intersection safety improvements

Option 1 is shown to the right, overlaid on a topographic map from the Town of Weston. This option keeps people walking and biking on the east and north sides of the street so that they never have to cross traffic. Switchbacks may be necessary between Recreation Road and the Commuter Rail tracks in order to descend the grade down the MWRA driveway/path.



Weston MapsOnline

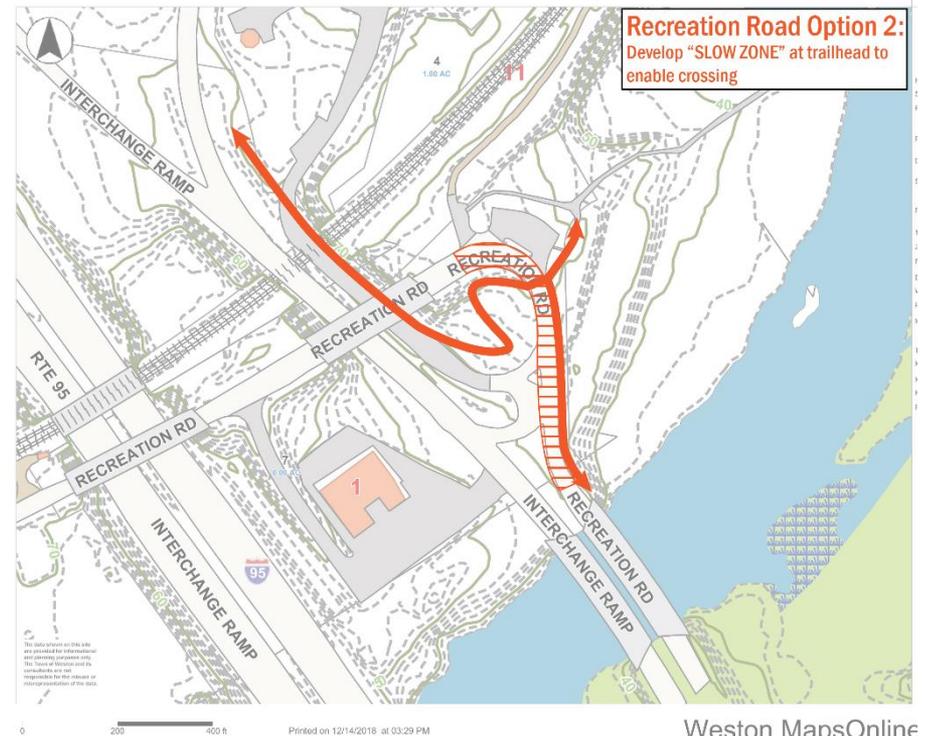
Connecting at the northern end of Recreation Road Extension

The sight distances along Recreation Road in this area are very short, meaning that drivers will not be able to see and react to an object in the roadway in time to avoid it. In an effort to enable people to safely cross Recreation Road, every effort should be made to reduce vehicle speeds and increase the drivers' sight distance.

Option 2 involves developing a "SLOW ZONE" at the Riverside Park trailhead to enable people to cross Recreation Road. A "SLOW ZONE" would incorporate advanced signage and pavement markings to alert drivers to the curve in the road and the likelihood of people crossing. This approach would require significant enforcement to make sure that drivers are responding to the safety messages. The conceptual alignment to the right suggests that the location with the best sight distances for both north- and southbound traffic is just south of the parking lot at Riverside Park. However, sight distances must be confirmed if this Option is pursued.

People walking and biking from the south could access Riverside Park at the existing trailhead. Those wanting to access the paths at the MWRA site would cross Recreation Road at the "SLOW ZONE" and maneuver some switchbacks down to the MWRA driveway.

The traffic volumes on the MWRA driveway are likely very low, so that the driveway could be configured as a carriage road similar to that described for Commonwealth Avenue in Chapter 2. Coordination with the MWRA would be needed for any changes to their driveway.



Weston MapsOnline

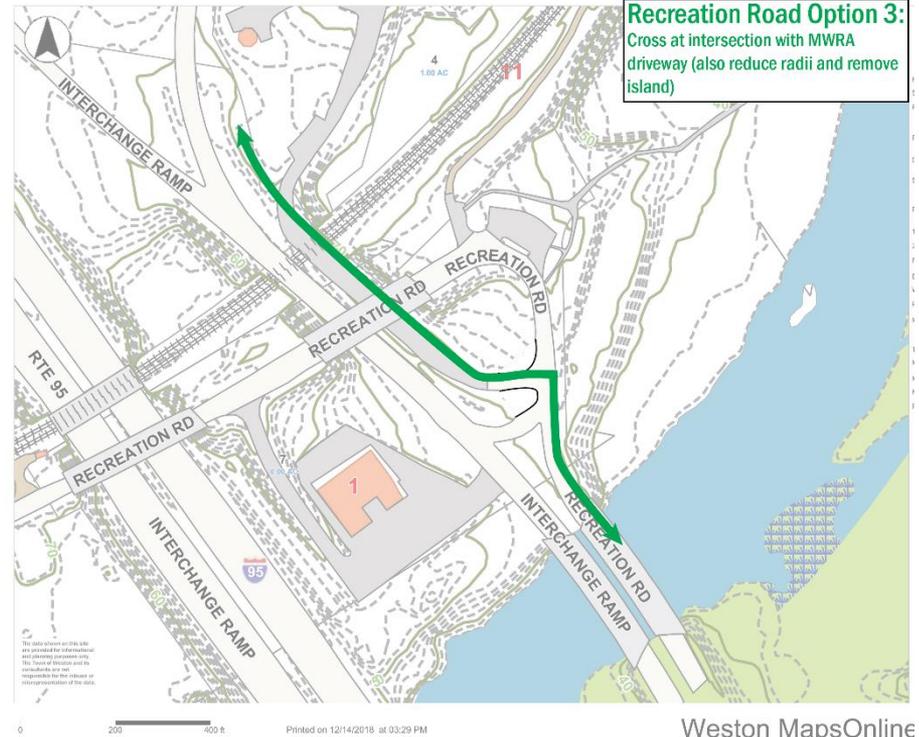
Connecting at the northern end of Recreation Road Extension

Option 3 (shown to the right) involves improvements to the intersection of Recreation Road and the MWRA driveway. As shown below, the existing intersection is somewhat combined with the on-ramp to the I-95 interchange ramp, making for a very wide intersection that enables/encourages drivers to increase their speed in order to merge with high-speed traffic.

The green peninsula between the MWRA driveway and the on-ramp would be extended towards Recreation Road to increase the corner radii and make the separation between the driveway and the on-ramp more pronounced.

Increasing the corner radii would also reduce the crossing distance for people and force drivers to go more slowly. The marked crossing would be located on the north side of the intersection.

Image source: Google Maps



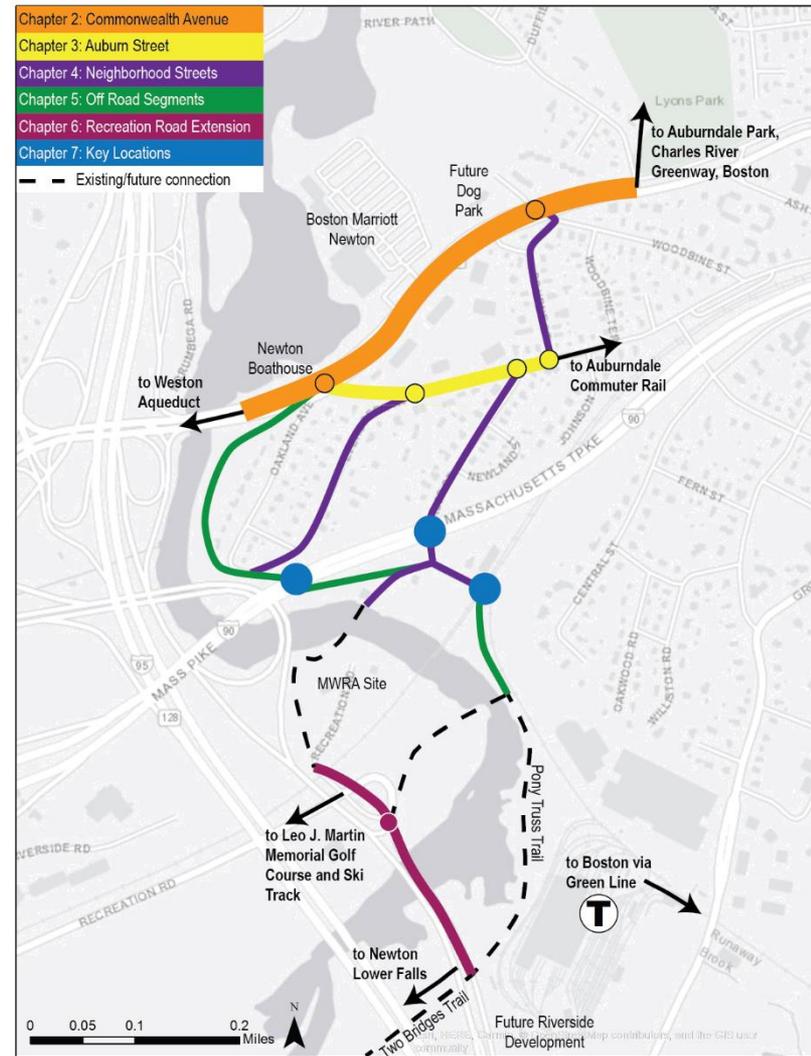
Recommendation and Next Steps

MassDOT and the developer of Riverside are pursuing improvements to Recreation Road Extension and the intersection north of the Charles River at the on-ramp and MWRA driveway. The Riverside Greenway Working Group offers its vision for a cross section and opportunities for connecting to the MWRA trail. Given the imperative of preventing conflicts between people walking/biking and vehicles travelling on Recreation Road, Option 1 is recommended because it avoids people crossing Recreation Road altogether.

As noted, coordination with the MWRA will need to occur to discuss any changes to their driveway. A carriage road approach such as that described for Commonwealth Avenue (Chapter 2) will provide access for people walking and biking, while still permitting low speed, low volume traffic to access the MWRA site. It is assumed that configuration of the driveway must maintain vehicle access, but could also provide improved legibility of a bicycle and pedestrian pathway. It may also be able to accommodate additional parking for trail access.

Chapter 7: Key Locations

- A. I-90 underpass
- B. Charles Street Tunnel
- C. Historic Depot Tunnel
- D. Recommendations and Next Steps

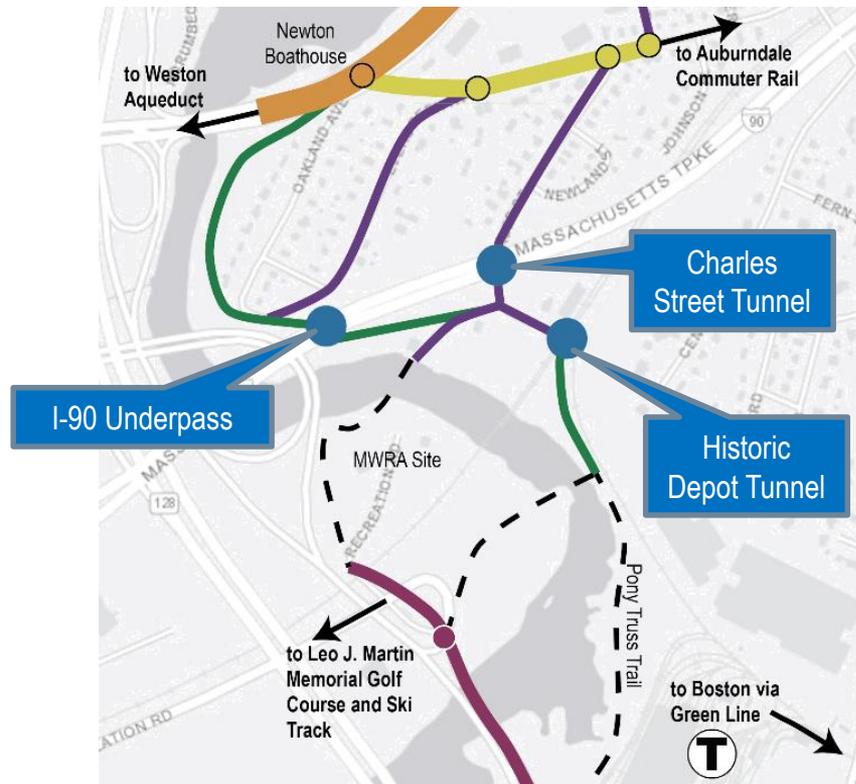


Overview

Among the barriers that exist within the study area are the MassPike (I-90) and the MBTA Commuter Rail tracks. There are three key locations at which users of the Riverside Greenway can overcome these barriers:

1. The I-90 Underpass
2. Charles Street Tunnel
3. Historic Depot Tunnel

This chapter describes the potential for overcoming the barriers at each of these locations.



1. The I-90 Underpass

At the top of Pigeon Hill off Oakland Avenue is an open area under the MassPike (right) where a shared use path could connect from a bike boulevard on Evergreen Avenue (Chapter 4) to the Pigeon Hill Trail (Chapter 5). MassDOT is reconstructing the footbridge at the Lasell Boathouse (and will eventually be reconstructing this segment of the MassPike), and is entertaining the idea of making an active transportation connection in this area.

One concept for this connection is suggested on the following page, and shows how this area could be transformed from an underused, vacant area to a valuable piece of the Riverside Greenway.



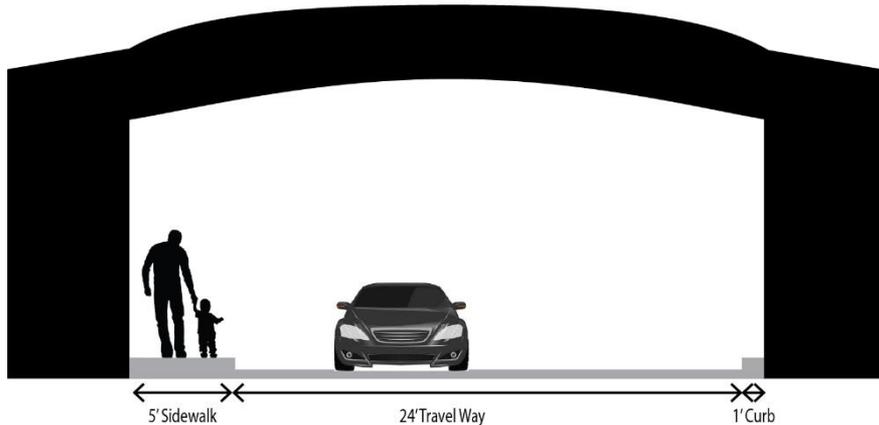
1. The I-90 Underpass



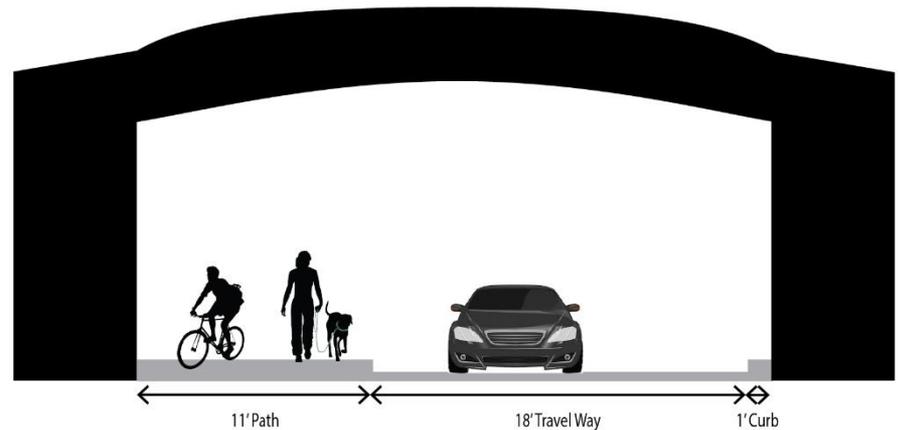
2. The Charles Street Tunnel

Neighbors on Charles Street have indicated that vehicle speeds are a problem at the curve and in the tunnel that passes under the MassPike (I-90). This creates an unsafe environment for people walking or biking through the tunnel (below, left). By making the roadway more narrow (and allocating the leftover space to walkers and bikers), drivers would be forced to slow down in this area. The figure below on the right illustrates this concept, which showed promise during a meeting with City officials.

Existing
30' wall to wall



Proposed
30' wall to wall



3. Historic Depot Tunnel

There exists a tunnel under the MBTA Commuter Rail tracks that previously connected to an historic train depot in the area. However, with the closure of the depot, MassDOT closed the tunnel to public access. Now if people want to get from Charles Street to the Pony Truss Trail, they cross the live tracks at grade, as shown below. This is a risky maneuver that could be avoided by reopening the tunnel.

This study included an engineering assessment to assess the structure and estimate the amount of work that would be needed to reopen the tunnel to the public. The full assessment (provided in Appendix D) determined that the structure is sound and can be reopened with minimal repairs and upgrades.



Recommendation and Next Steps

The evaluation process for these three concepts is shown in Appendix E. The next steps for implementation are:

- I-90 Underpass
 - Work with MassDOT to implement this project along with the Pigeon Hill Trail and the replacement of the Lasell Footbridge (currently at 25% design)
- Charles Street Tunnel
 - Bundle this project with the Neighborhood Streets/Bike Boulevards project; the path through the tunnel could be implemented in the interim with striping and flexposts, until reconstruction of a raised option is possible
- Depot Tunnel
 - Work with DCR to initiate this project

Potential Funding Sources

- DCR
- MassDOT
- City of Newton
- MassDOT Complete Streets Funding Program
- MassTrails



Overview

This chapter proposes a plan for implementing the Riverside Greenway. It takes the preferred alternative of each chapter and considers the score assigned during the evaluation, then suggests a logical phasing plan. Phasing depends heavily on bundling smaller projects to reduce the administrative effort needed to manage each individual piece. The individual projects described so far in this study have been bundled into five phases, some of which can be pursued concurrently.

The implementation plan that follows includes the following details:

- **Lead Agency:** usually the owner of the facility or property, or the most appropriate project lead given the nature of the project (for example, trail projects are usually more in line with DCR's mission than MassDOT's)
- **Potential Funding Sources:** while funding for the project may be provided by the lead agency, alternative sources are also suggested
- **Cost Estimate:** the planning level cost estimate for each bundle/phase is based on unit costs applied to the approximate length of the facility. These estimates are to be used for planning purposes only to provide a sense of the order of magnitude commitment an agency may be considering relative to other projects.
- **Timeframe:** the timeframe suggests how quickly a phase could be completed. For example, bike boulevards on neighborhood streets are relatively easy and low cost projects that could be implemented in the near term, while other projects may have to go through rigorous designing and approval phases.

Next Steps: with as much detail as possible, next steps are provided for initiating the project and coordinating with appropriate stakeholders and agencies.

This chapter first describes how the projects are bundled and proposes a phasing plan. Then the Implementation Plan is presented.

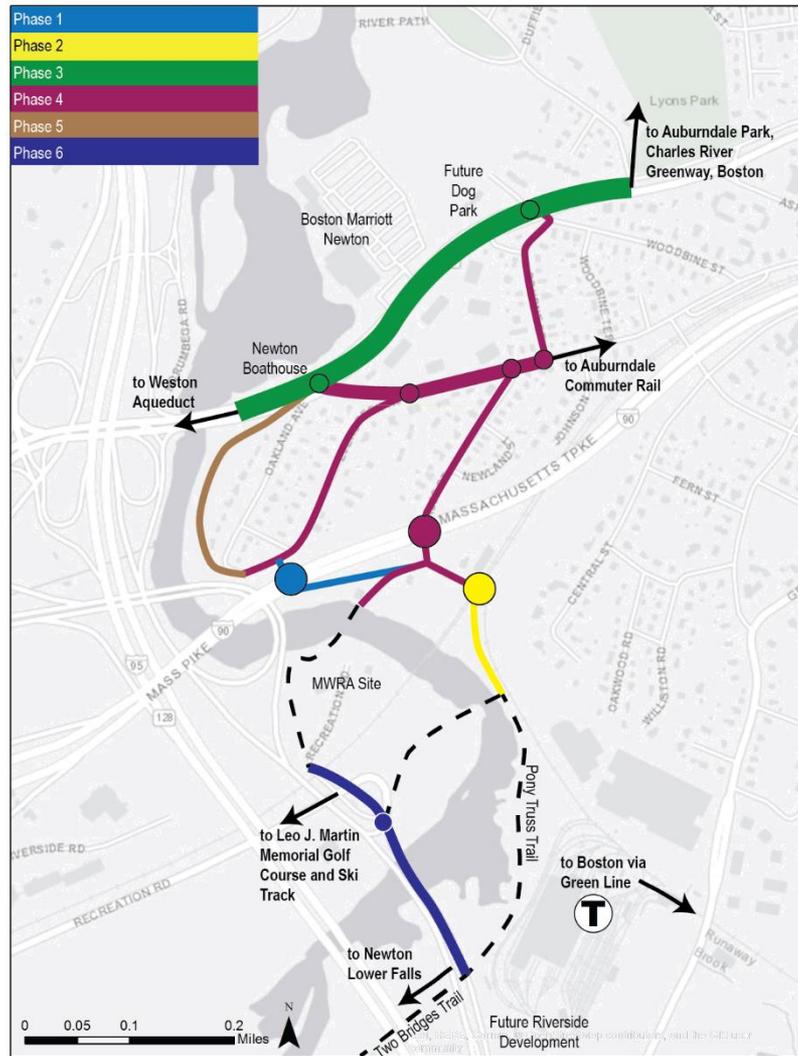
Phasing

This chapter proposes a plan for implementing the Riverside Greenway. It takes the preferred alternative of each chapter and considers the score assigned during the evaluation, then suggests a logical phasing plan. Phasing depends heavily on bundling smaller projects to reduce the administrative effort needed to manage each individual piece. The individual projects described so far in this study have been bundled into five phases, some of which can be pursued concurrently.

1. Pigeon Hill Trail/I-90 underpass shared use path: MassDOT has suggested that the Pigeon Hill Trail could be bundled with the reconstruction of the footbridge between the Lasell College Boathouse and the MWRA site. The footbridge is currently at 25% design, so in order to catch up, the trail and the path through the I-90 underpass (which is essentially an extension of the trail) are Phase 1.
2. The Depot Tunnel was the highest scoring project. Discussions with MassDOT and DCR suggest that the agencies are amenable to this project moving forward, so this project is Phase 2 to get the ball rolling.
3. The Commonwealth Avenue project will be a significant project for the City of Newton, and will involve public outreach, stakeholder coordination, and engineering. Initiating this project with the City now will get the project in the funding queue.
4. Bike boulevards on Neighborhood Streets are a relatively easy project. While the recommendation for the Charles Street Tunnel is for a raised shared use path, in the interim the basic concept could be achieved with flexposts when the bike boulevards are installed. Moreover, the bike lanes recommended for Auburn Street simply involve pavement markings (and removing on-street parking) and are in the same geographical area as the neighborhood streets recommended for bike boulevards, so combining these projects seems logical.
5. This phase is the footpath on the west side of Pigeon Hill. This concept may involve significant public outreach to achieve consensus and approval. Also, since it is a relatively lower priority segment as there are parallel routes (bike boulevards) that can be implemented more quickly.
6. The Recreation Road Extension is unique in that it is closely tied to the Riverside Development. The Riverside Greenway Conceptual Plan puts forth a vision and emphasizes the importance of creating a safe north-south connection between the MWRA path and the Two Bridges Trail and MBTA Riverside Station to the south. However, implementation details are not available as this connection is one part of a much larger project.

The map on the following page indicates this suggested phasing plan.

Phasing Map



Implementation: Phase 1

Projects:

Pigeon Hill Shared Use Path, including section through I-90 Underpass

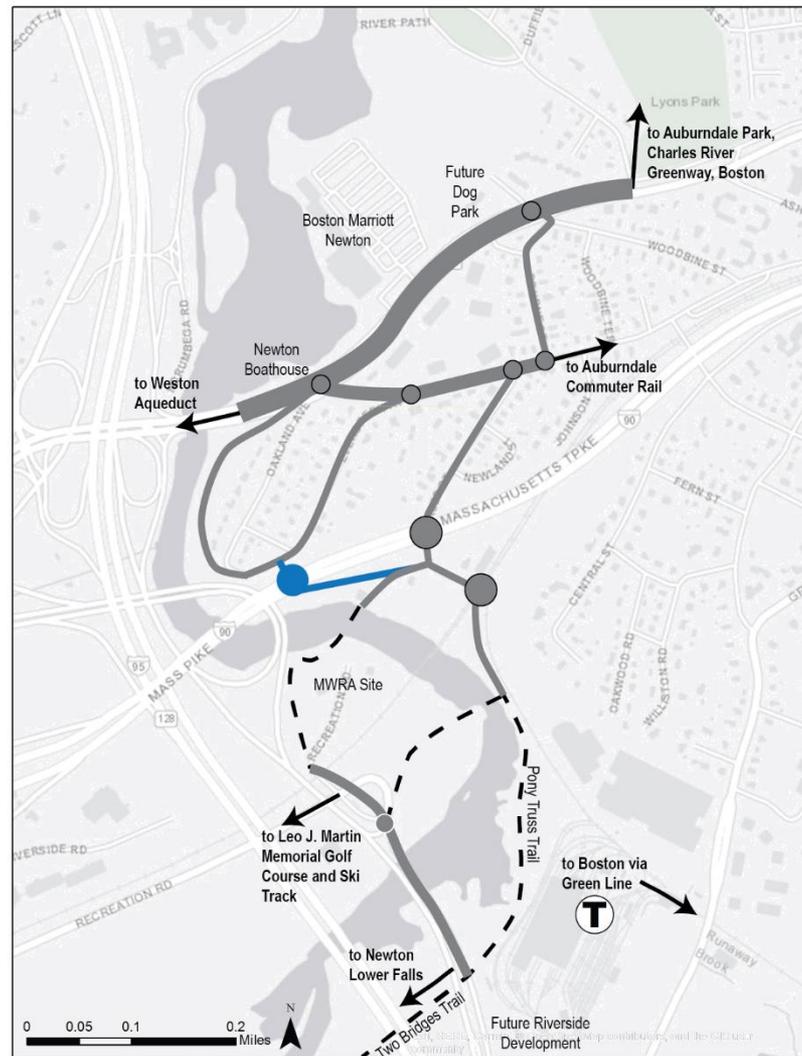
Lead Agency MassDOT

Potential Funding Sources MassDOT, MassTrails

Cost Estimate <\$350K

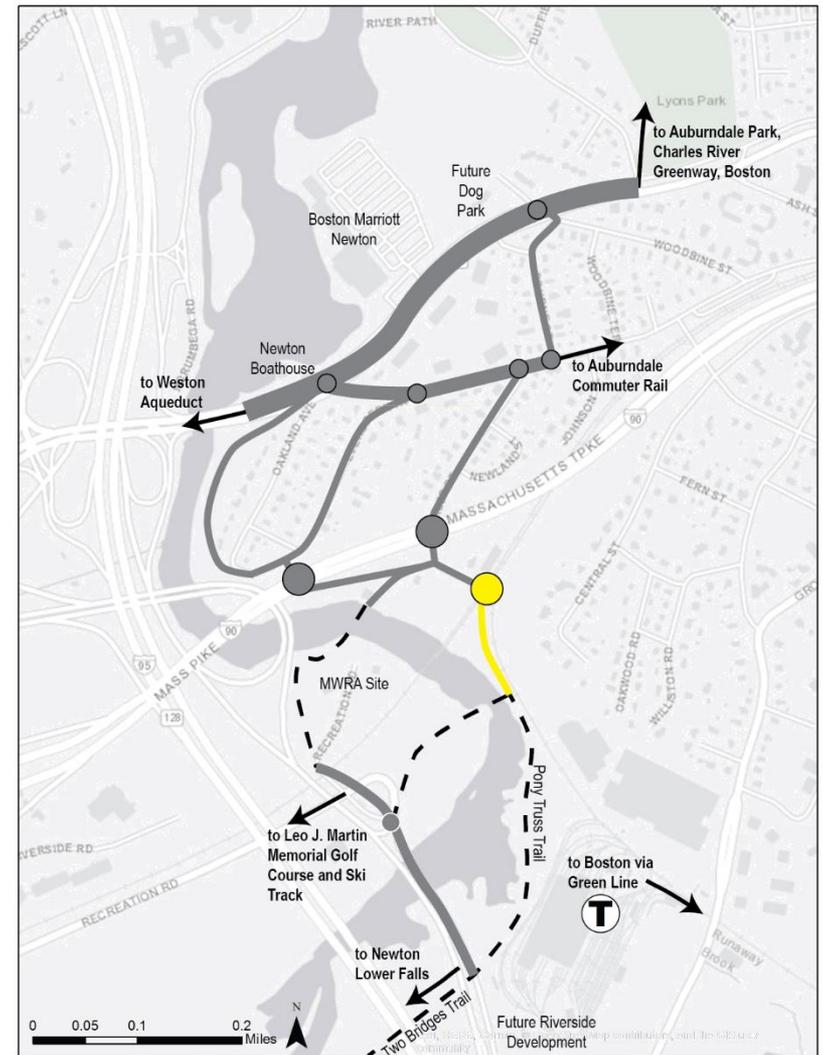
Timeframe In progress

- Next Steps**
- Work with MassDOT to potentially add these projects on to the MassDOT footbridge reconstruction project (which is currently at 25% design)
 - Obtain survey and develop 25% designs (based on MassDOT design standards for shared use paths)
 - No permits are anticipated at this time



Implementation: Phase 2

Projects: Depot Tunnel and Pony Truss Bike/Walk Trail	
Lead Agency	DCR
Potential Funding Sources	DCR, MassDOT/MBTA, MassTrails, Appalachian Mountain Club grants, private grants
Cost Estimate	<\$1.5 M
Timeframe	2-5 years
Next Steps	<ul style="list-style-type: none"> • MassDOT to give DCR a public access easement • Coordinate with DCR to determine design standards and additional next steps • Changes to the Pony Truss Trail might trigger wetland and water resource permits



Implementation: Phase 3

Projects:

Commonwealth Avenue Cross Section 2: no vehicles on carriage road between Woodbine Street and Auburn Street, limited vehicle access between Woodbine Street and Islington Road; includes making the improvements to the intersections at Woodbine Street and Auburn Street

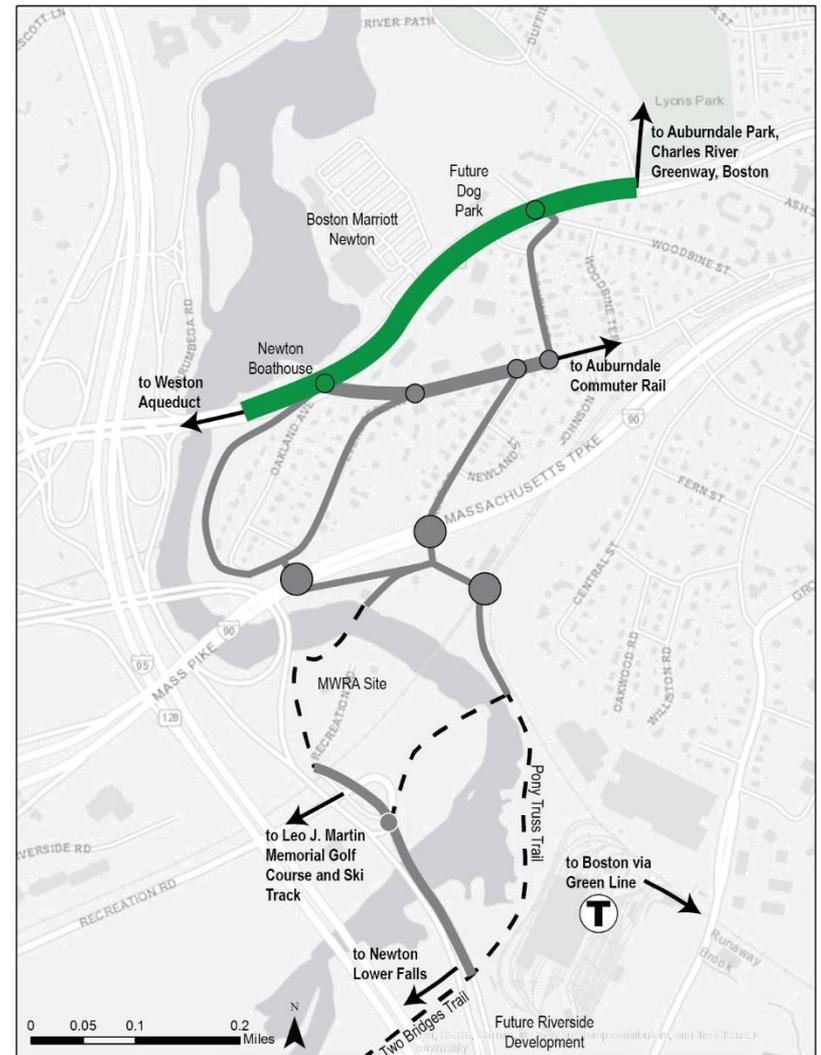
Lead Agency City of Newton

Potential Funding Sources TIP, Newton Capital Budget, MassTrails, HSIP, STP, Complete Streets Funding Program

Cost Estimate <\$2M

Timeframe 5+ years

- Next Steps**
- Work with the City of Newton to initiate this project (starting with a road diet analysis) and to coordinate with other projects in the area (specifically, the Dog Park)
 - Coordinate with the Boston Marriott Newton as an abutter
 - While some access permits may be necessary, no other permits are anticipated at this time



Implementation: Phase 4

Projects:

Bike Boulevards on Neighborhood Streets; Charles Street Tunnel: raised shared use path; Auburn Street Cross Section 1: Conventional Bike Lanes

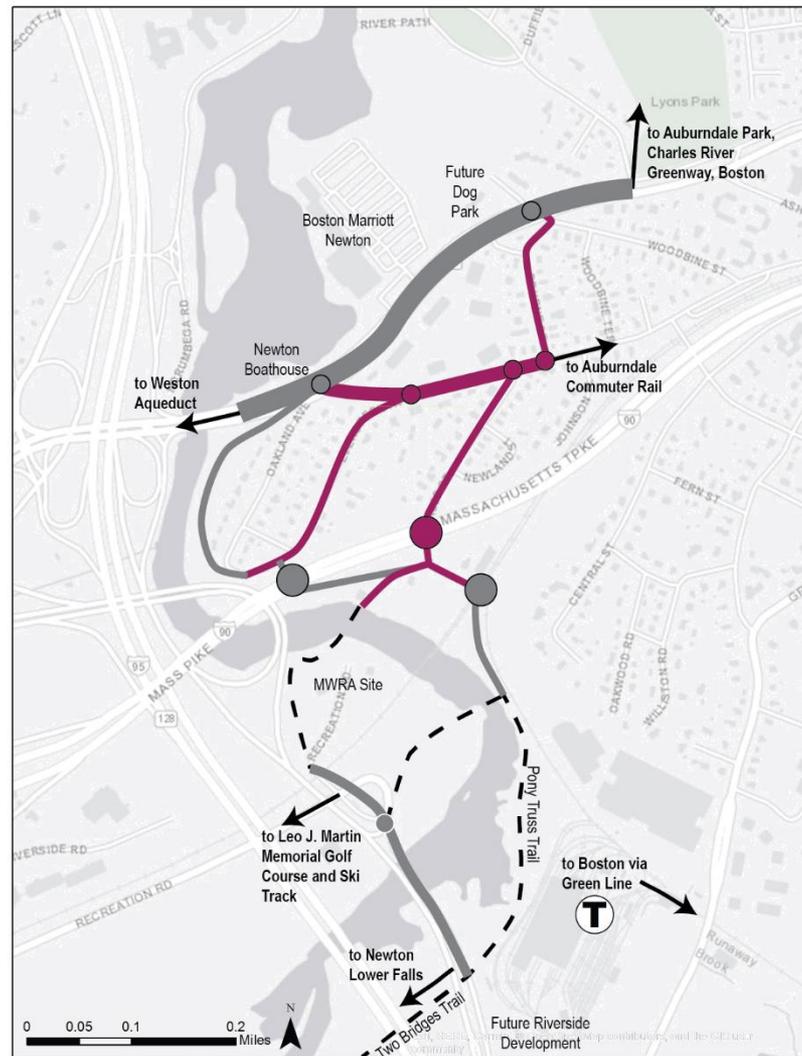
Lead Agency City of Newton

Potential Funding Sources Complete Streets Funding Program, Newton Capital Budget, TIP, Chapter 90 funding, MassTrails

Cost Estimate <\$150k

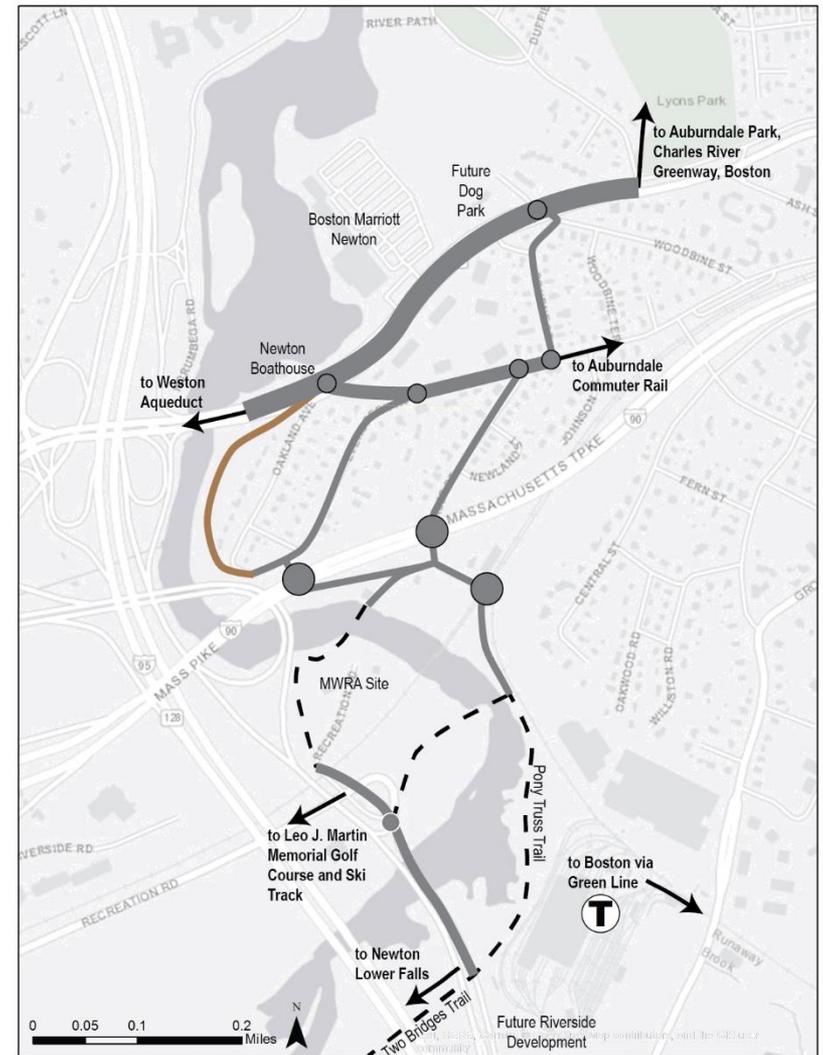
Timeframe Less than one year for bike boulevards and interim Charles Street Tunnel improvements; 2-5 years for shared use path in Charles Street Tunnel and Auburn Street improvements

- Next Steps**
- Work with the City of Newton to initiate these projects
 - Charles Street Tunnel improvements could be implemented in the interim using flexposts with more formal shared use path to come later
 - A public process to approve removal of the on-street parking might be necessary
 - The bike lane striping might be able to be accomplished during regular maintenance activities
 - No permits are anticipated at this time



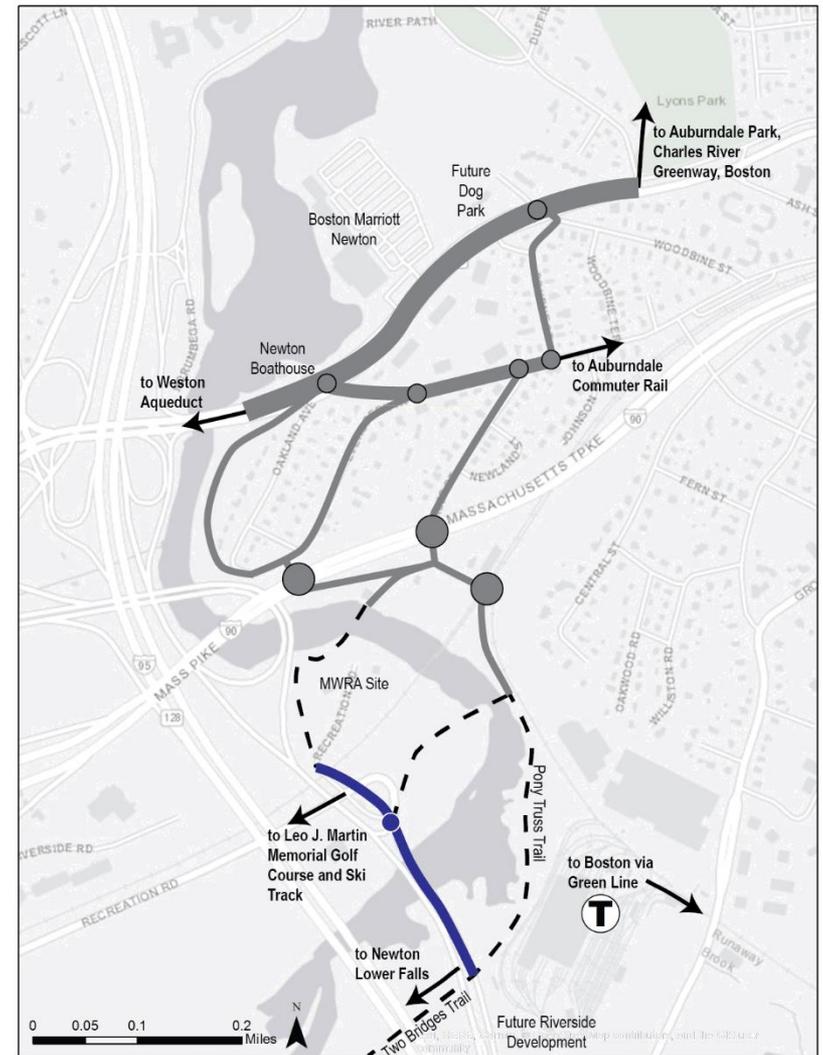
Implementation: Phase 5

Projects: West Pigeon Hill Footpath (from Comm Ave to I-90 Underpass)	
Lead Agency	City of Newton
Potential Funding Sources	Appalachian Mountain Club grants, MassTrails, DCR, private grants
Cost Estimate	<\$200k
Timeframe	5+ years
Next Steps	<ul style="list-style-type: none"> • Hold neighborhood meetings to share the concepts with abutting property owners and gather feedback • Coordinate with Newton Conservation Commission • Obtain survey and confirm property boundaries/ownership • Coordinate access with land owners (Commonwealth of Massachusetts) • No permits are anticipated at this time



Implementation: Phase 6

Projects: Recreation Road Extension	
Lead Agency	MassDOT, DCR (with assistance from Riverside Developer)
Potential Funding Sources	MassDOT, DCR, MWRA
Cost Estimate	TBD
Timeframe	Less than 2 years
Next Steps	<ul style="list-style-type: none"> Continue to coordinate with MassDOT, DCR, and the Riverside Developer





Memorandum

120 St. James Avenue, 5th Floor
Boston, Massachusetts 02116

www.jacobs.com

Subject	Existing Conditions Summary	Project Name	Riverside Greenway
Attention	Riverside Working Group	Project No.	E2X8100
From	Dieckmann Cogill, Beth Isler		
Date	October 3, 2018		
Copies to			

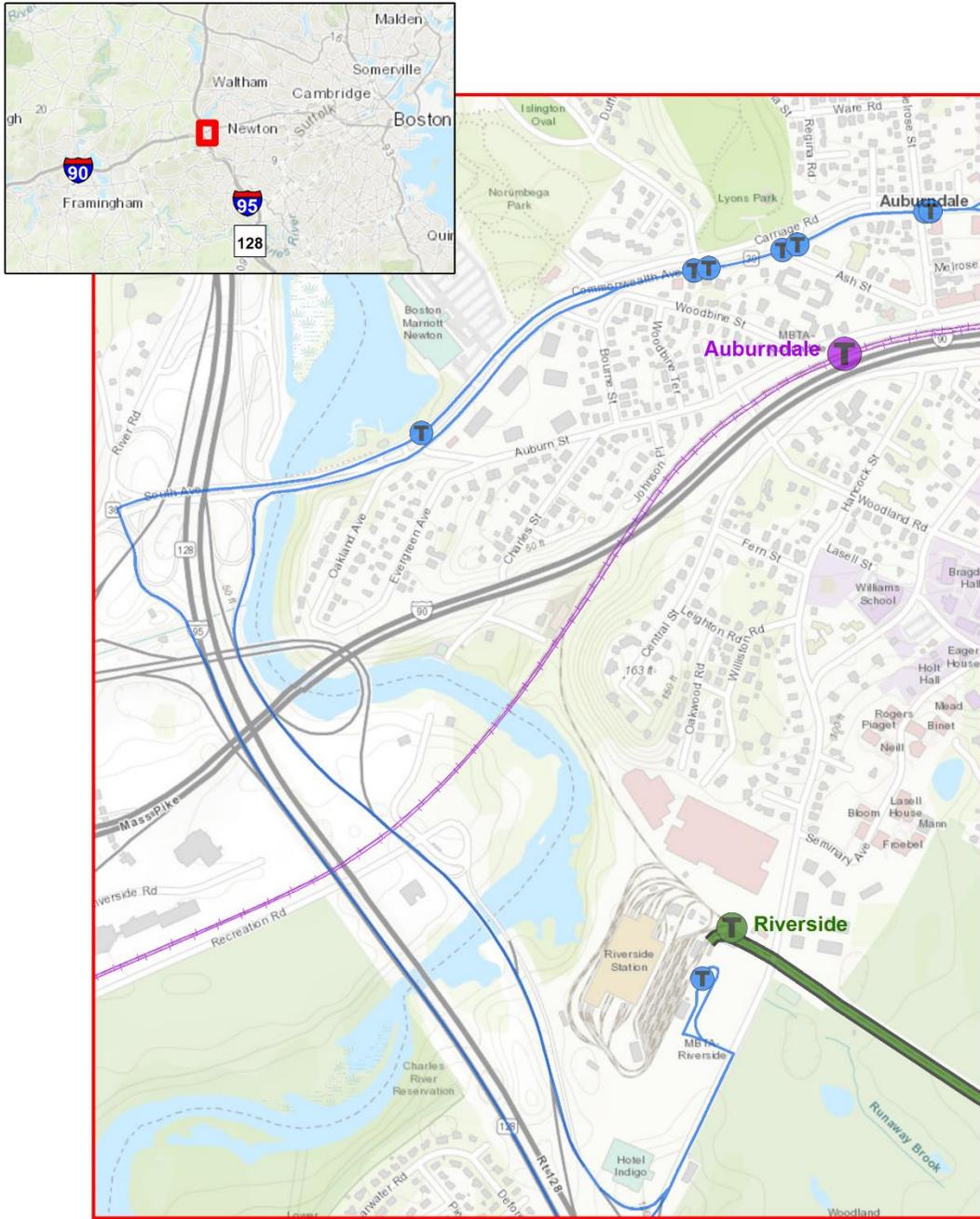
1. Introduction

The idea of a connected park system along the Charles River was first put forward by Charles Eliot in the 1890s. Since then, various open spaces and parks have been established along the river, but gaps between them remain and some parklands are isolated and difficult to reach. One of the most notable gaps is between Norumbega Park, the Charles River Reservation, and Newton Lower Falls. The Riverside Greenway will make these connections while providing opportunities for recreation and a new active transportation corridor. The Riverside Greenway Conceptual Plan will appraise options and design alternatives for constructing the Riverside Greenway.

The Riverside Greenway will provide a key link in the Boston regional trail network. It will connect numerous recreation areas and transportation nodes. It will link the Upper Charles River and Blue Herron paths in Auburndale with Newton Lower Falls and Riverside Park via a separated path that provides a low stress connection for people of all ages and abilities. It will extend the existing greenway network by providing a connection from the end of the Green Line D at Riverside station and overcoming the barriers of I-95, the MassPike/I-90, and Commonwealth Avenue. Numerous parks and recreation opportunities west of I-95 will be unlocked for people from Boston, while people west of I-95 will be able to reach the Riverside MBTA station on foot or by bike to travel into Boston. The Riverside Greenway is a key piece of realizing a Greener Greater Boston.

The Solomon Foundation, in partnership with state and local agencies, has initiated the Riverside Greenway Conceptual Plan. The Plan is the next step in making the cohesive Riverside Greenway a reality. Once complete, this Plan will provide an assessment of the feasibility of the Riverside Greenway and outline next steps to advance it. It will cultivate local interest to broaden support, building on the efforts of the Riverside Greenway Working Group. The conceptual plan will provide a basis for funding applications to further the Greenway's design and construction.

The Riverside Greenway study area surrounds the Charles River east of the I-90/MassPike and I-95/Route 128 interchange in Newton (Figure 1). It includes Commonwealth Avenue (Route 30) at its northern edge, connector road to the south, and is well-served by transit: the D-Branch of the Green Line ends at Riverside, the Framingham/Worcester Commuter Rail stops at Auburndale, and there is bus service along Comm Ave and at the Riverside T station.



T MBTA Bus Stop

Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, ©



Figure 1: Vicinity Map

This memorandum describes the findings of the first task of the Riverside Greenway Conceptual Plan. The first task documents existing conditions in order to assess the impacts that proposed alternatives may have on safety, natural and cultural resources, and the built environment. This memorandum describes the study team's site analysis and is organized into the following sections:

- Background and context
 - An overview of the study area
 - Area history
 - Ongoing plans and studies
- Site analysis
 - Bridges and underpasses
 - Cultural and natural resources
 - Streets
 - Transit
- Alternative routes overview
- Conclusions and next steps

In addition, meeting notes from the kick off meeting/site walk with the Working Group are attached.

1.1 Draft Project Goals

The 1998 Upper Charles River Reservation Master Plan set forth goals that still apply to this study area even 20 years later. The 1998 vision and goals were reviewed and revised to apply specifically to the Riverside Greenway project, as follows:

Vision

Link communities and bring people together to share in a common natural resource.

Goals

- Improve access to the river and/or greenway for people walking, biking, or taking part in other activities
- Improve circulation and open-space connections along the river corridor
- Protect and enhance the character of open space and the shoreline along the River
- Protect and improve visual/scenic quality
- Limit potential conflicts between activities

As this project progresses, it will be important to develop evaluation criteria that reflect these goals in order to make sure that the project stays true to its intent. Possible evaluation criteria include:

- Number and quality of access points to the River
- Number and intensity of impacts to natural and cultural resources
- Number and quality of locations from which to view the River
- Number and intensity of potential conflict points between users

1.2 Methodology

The Riverside Greenway Working Group leads this study and provides direction for the study team. The Working Group is comprised of representatives from Bike Newton, Newton Conservators, the Newton neighborhoods local to the study area (Auburndale and Lower Falls), and the Solomon Foundation. The Working Group ensures that the study stays true to the project goals and reflects the spirit of Newton and the regional greenway network.

The Riverside Greenway Working Group met with the study team on June 1, 2018 to walk the study area and discuss opportunities and constraints. A summary of this meeting is attached, and the findings are incorporated into the overall document.

The first step in developing the Plan is to assess existing conditions to establish an understanding of the context in which the Riverside Greenway will be constructed. The existing conditions assessment documents cultural and natural resources, street operations, transit in the area, and bridges and underpasses. Next, possible routes for the Greenway are overlaid on the existing conditions to estimate any impacts that the Greenway would have on the area. Refinements to the route alignments would then take place to finalize the concepts.

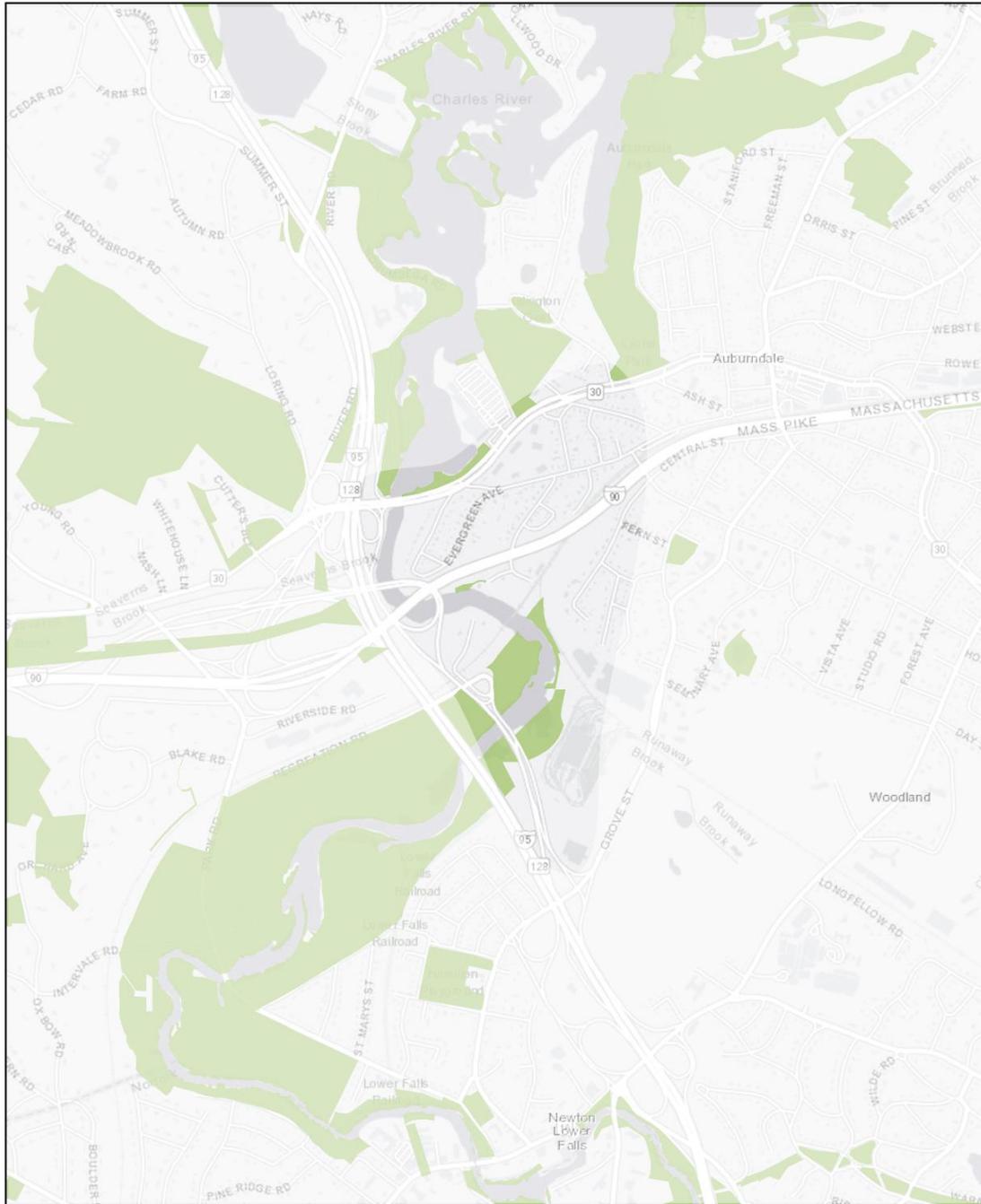
2. Background and Context

This section describes the study area and its history, and summarizes plans and studies that are relevant to the Riverside Greenway.

2.1 Study Area

Approximately 180,000 people live within 5 miles of the Riverside Greenway study area. While there are no Environmental Justice communities within or adjacent to the study area, it is well-served by transit and thereby accessible to many more people beyond the immediate area: the D-Branch of the Green Line ends at Riverside, the Framingham/Worcester Commuter Rail stops at Auburndale, and there is bus service along Comm Ave and at the Riverside T station.

Figure 2 shows that while there is much open space throughout the area, they are not connected to each other. The Riverside Greenway seeks to connect these open spaces with walking and biking connections much like a 'linear park.' This would enable people enjoying the Blue Heron Paths in Lyons Park to walk or bike to the facilities at the Leo J. Martin Golf Course, to the Riverside T stop, or to Newton Lower Falls.



MA Protected OpenSpace
Area in center of map is study area

Service Layer Credits: Esri, HERE, Garmin, ©
OpenStreetMap contributors, and the GIS user
community

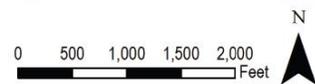


Figure 2: Gaps between protected open spaces in the region

2.2 History

This area of Newton and the Upper Charles River is known as the Lakes District. Charles Eliot wrote a report to the Metropolitan Park Commission (predecessor to the Massachusetts Department of Conservation and Recreation (DCR)) in 1893 (Figure 3) outlining the open spaces that the region should provide for its residents. In 2018, the Livable Streets Alliance notes that:

*Through the efforts of urban park pioneers Frederick Law Olmsted and Charles Eliot, **Boston has a rich legacy of linear parks and greenways, but they were never finished.** The Emerald Network builds on this portfolio of 100 miles of greenways to create a seamless 200-mile network across the urban core, from the Mystic River in the north to the Neponset River in the south.¹*

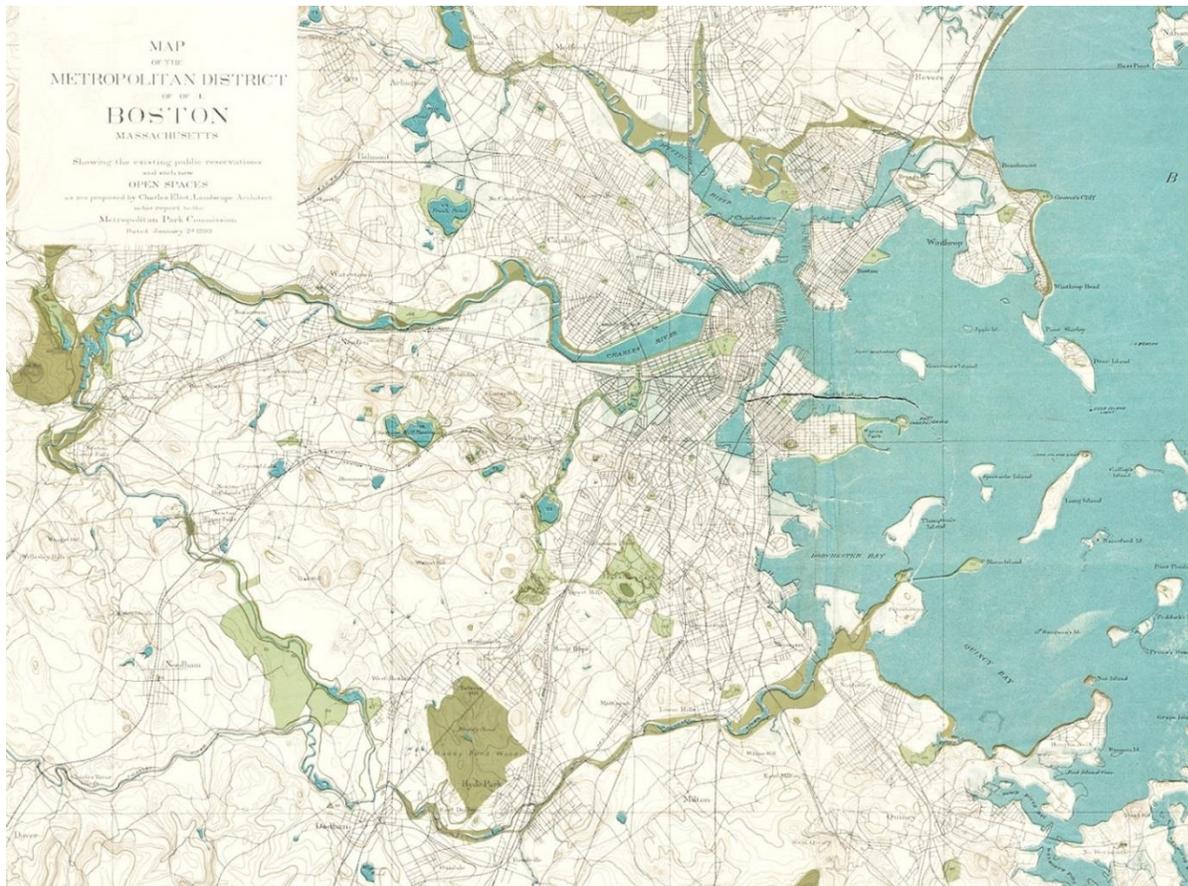


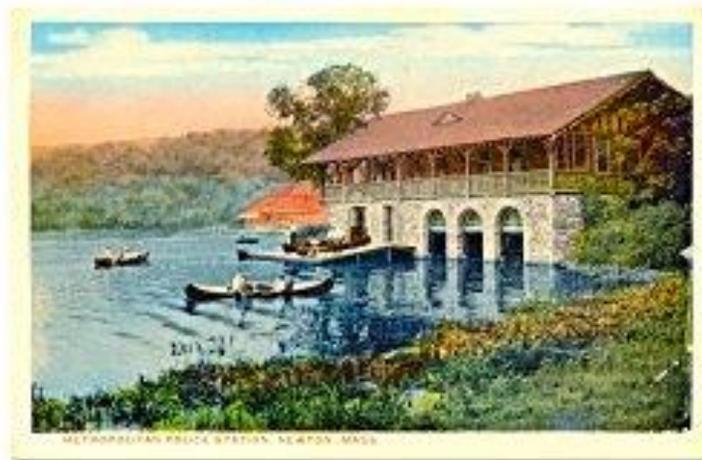
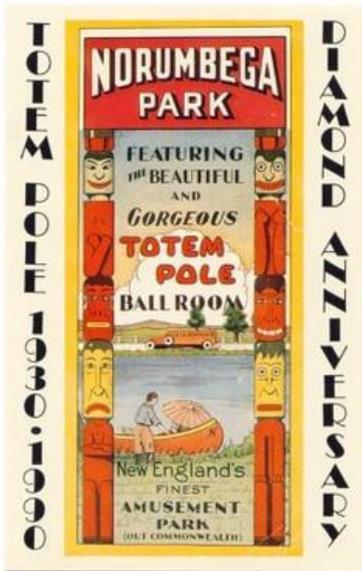
Figure 3: 1893 Metropolitan Park Commission Open Space map showing a greenway through the Lakes District (source: Boston Public Library <https://collections.leventhalmap.org/search/commonwealth:wd376704k>)

Historic Newton², a partnership between the Newton Historical Society and the City of Newton, indicates that the Upper Charles River Lakes District was an immensely popular recreation area in the late 1800s,

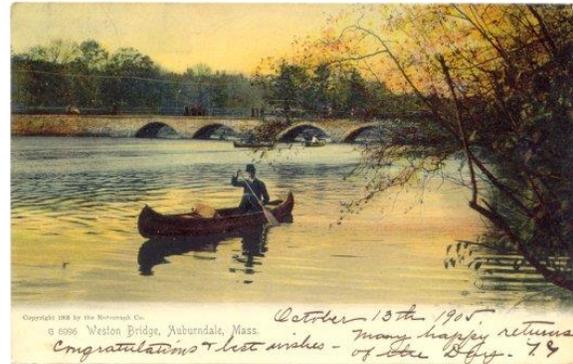
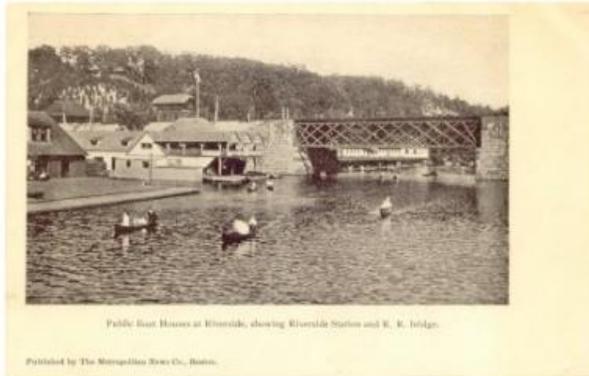
¹ Livable Streets Alliance Emerald Network: <https://www.emeraldnetwork.info/vision>

² Canoeing on the Charles: <http://www.newtonma.gov/gov/historic/events/past/canoeing/default.asp>

particularly for canoeing. The local railroads built an amusement park called Norumbega Park to entice people to take rail out to the Lakes District. After World War II when automobile ownership became more common, the Lakes District went into decline and the Charles River became too polluted to swim or boat.³ Norumbega Park closed in 1963 and eventually the Marriott Hotel was constructed on the site. Although the Charles River has been cleaned up, the area has been relatively unused since then, despite its natural beauty.



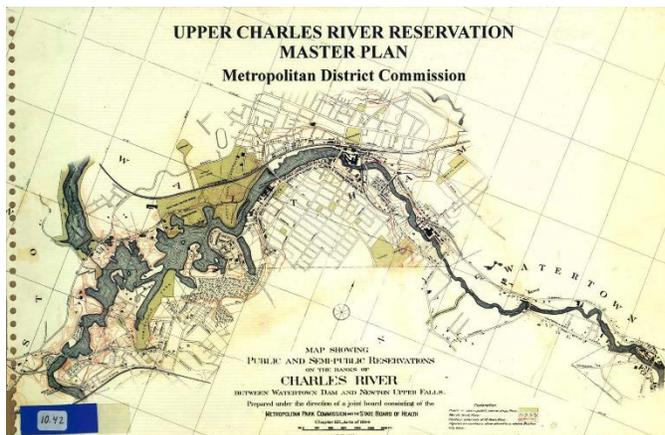
³ https://en.wikipedia.org/wiki/Norumbega_Park



Photos from Historic Newton <http://www.newtonma.gov/gov/historic/events/past/canoeing/default.asp> and Wikipedia https://en.wikipedia.org/wiki/Norumbega_Park.

2.3 Plans and Studies

Several plans are relevant to the study area and have been reviewed below to ensure that the Riverside Greenway will be consistent with local and regional planning initiatives. A summary of relevant aspects of each plan and project is provided below.



1998 Metropolitan District Commission's Upper Charles River Reservation Master Plan

This master plan might be considered a sister plan to the Riverside Greenway Conceptual Plan. In many ways, the Riverside Greenway will be a continuation of the Upper Charles River Reservation.

The master plan seeks to reopen the Upper Charles River (the section between Newton and Watertown). The southwestern end of the study area (the "Lakes District" at the

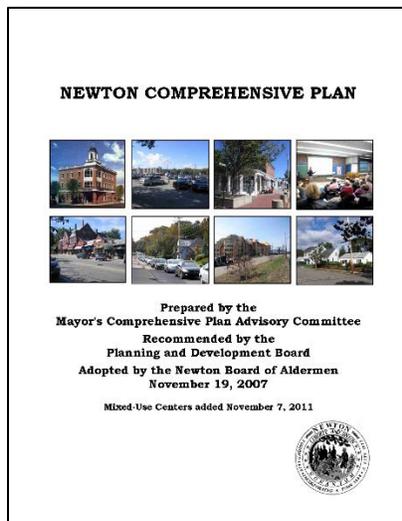
northeastern corner of I-95/Route 128 and Commonwealth Avenue) overlaps with the Riverside Greenway from Commonwealth Avenue down to the MassPike. The MDC (now Department of Recreation, DCR) plan notes that the Upper Charles River was a heavily used recreation area between the 1890s and 1940s, but then suffered "decades of neglect, abuse, and lost public interest." By 1998, however, there was a resurgence of interest in the area, and the MDC/DCR committed to "reclaiming and extending the public domain of the Charles River." The Upper Charles River Reservation in 1998 experienced the same problems that the Riverside Greenway now attempts to remedy for its study area: mainly, its existence as a "virtually undiscovered public resource" and "poor accessibility and the inability of visitors to find their way around it easily on foot."

The goals of the 1998 master plan are so consistent with the Riverside Greenway that they have been used as the basis for this 2018 conceptual plan. The master plan recognizes that the undiscovered beauty and nature of the Charles River “adds immeasurably to the quality of life in this region.”

The master plan envisions the reservation as “a place of 6- to 8-foot-wide paths, trails, and boardwalks through woodlands. This more narrow path width will encourage visitors to slow down and experience some of the intimacy that this stretch of the Reservation greenway affords. Existing trails are improved only where appropriate. Also, unlike “The Basin,” [between Boston’s Back Bay and Cambridge/MIT] this is not a place of uninterrupted bike traffic on both sides of the River. Bicycles are allowed; however, foot travel is encouraged throughout as the best way to discover and appreciate the diverse features of both natural and man-made origin.”

The master plan recommends four pathway types:

1. Primary paths: 7-foot bituminous concrete with a 12-inch shoulder
2. For narrow or heavily wooded sections or loop trails: 4-foot cement-modified soil
3. For sensitive resource areas or steep slopes: elevated boardwalks
4. For existing narrow trails with only occasional foot traffic: trim vegetation and consider a 12-inch high wooden railing to encourage people to stay on the trail



2007 Newton Comprehensive Plan

The Newton Comprehensive Plan establishes land use and development regulations to guide growth and achieve a vision for the City:

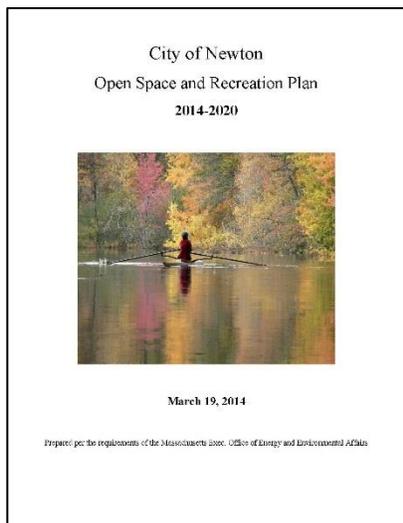
The vision of the city we seek includes pedestrian-friendly streets that connect neighborhoods and that work to enhance public transit, that in turn connects clusters of activity. In that vision, traffic calming and streetscape improvements encourage pedestrian-friendly, vital urban and residential environments. Mobility for all is enhanced for both auto and non-auto modes, and that is accomplished through changes that are consistent with community character and historic resources. A full range of travel modes is supported, including walking, cycling, carpooling and taking transit, among them reducing reliance on auto driving. Safety is protected on all roads and in all neighborhoods. Land

development is designed with sensitivity to transportation needs, and transportation development is sensitive to building good environments. Achieving that vision requires creative efforts that are well coordinated both among the City’s municipal departments and varied public interests and between City, regional, and state agencies.

Relevant to the Pigeon Hill neighborhood and Charles Street, the Plan specifically calls for making “wider usage of traffic calming devices as a means of slowing traffic and/or diverting its path. Such practices as speed humps, traffic circles, center island narrowing, median barriers, half-street closures, and forced turn islands are already in use in Newton. Many other newer devices, such as raised crosswalks, are in use in

nearby communities, but in this City the use of calming techniques has been sparing. Requests for traffic calming efforts are a common item docketed for action by the Aldermen. Support for traffic calming appears to be strong among both residents and their officials.”

Significant for Commonwealth Avenue, the Plan recommends designing “Newton roadways for relatively low vehicle speeds. Higher design speeds require more displacement of bordering vegetation, greater impediments to pedestrian movement and safety, and higher construction costs for only minimal travel time gains.”



2014 City of Newton Open Space and Recreation Plan 2014-2020

Relevant to the Riverside Greenway, the plan recognizes the “need to develop more linkages between open space assets using linear greenways and pathways facilitating emerging trail networks...An important concept receiving significant interest within Newton is for the establishment of various trail systems. These have the potential for facilitating integration and/or linking of various open space resources while also providing the benefits of walkable pathways and multiple points of access. Possibilities include consideration of an overall trail network, aqueduct loop trails, interconnections with segments of the Charles River pathway, connections with potential future rail trails and also connections with regional trail systems. With the increased presence of trail bikes, it will be important to address ways to accommodate bike access to and use of suitable trails and appropriate open spaces while also preserving natural resources

and respecting pedestrian use.”

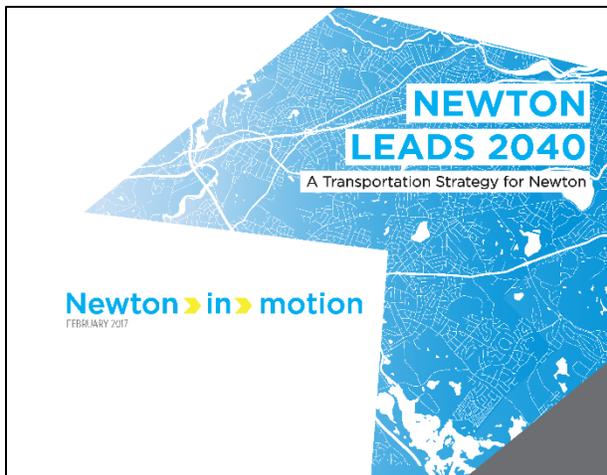
The plan also recommends that the City “Enhance the use of Commonwealth Avenue for jogging and bicycling, where needed.” As access along and across Commonwealth Avenue is critical for the Riverside Greenway, this is a valuable piece of support.

2016 City of Newton Complete Streets Policy

In 2016, the City adopted a Complete Streets Policy to accommodate all roadway users equally. While this policy will only apply to on-road segments of the Riverside Greenway, it will be an important consideration for connectivity for people walking and biking to access to the Charles River. To summarize the policy, it “envisions streets that serve not only as automobile thoroughfares, but also as public spaces and community resources. Complete streets are an integrated network of roadways, sidewalks, bike lanes, and other inviting facilities for those who choose to travel by any means and for those who seek to use the streets as neighborhood resources. The City envisions that Newton’s street network will be designed and operated to provide safety, comfort, and access for all who use the street, whether they use the streets as residents, pedestrians, bicyclists, transit riders, motorists, motorcyclists, freight haulers, service and delivery personnel, and emergency responders, etc. (collectively, “all users”).”

2017 Newton Bicycle Plan (part of the 2017 Capital Improvement Plan FY2019-2023)

The Bicycle Plan is updated annually in the Capital Improvement Plan. It recommends creating “a first-class recreational facility on the length of the Commonwealth Avenue – Carriage Road,” noting that: “Commonwealth Avenue is a major east/west thoroughfare that provides a connection between Weston and Brighton, and a desirable facility for commuting and recreational cyclists. Bike lanes should be added along the outside of the travel lanes on the main roadway for higher speed cyclists, and a two-way multi-use boulevard along the existing carriage lane should be created for lower speed users. Connections between the main roadway and the carriage lane, where appropriate, and designs that minimize crossing areas of uninterrupted motor vehicle flow, are critical to cyclist safety.”



2017 Newton in Motion

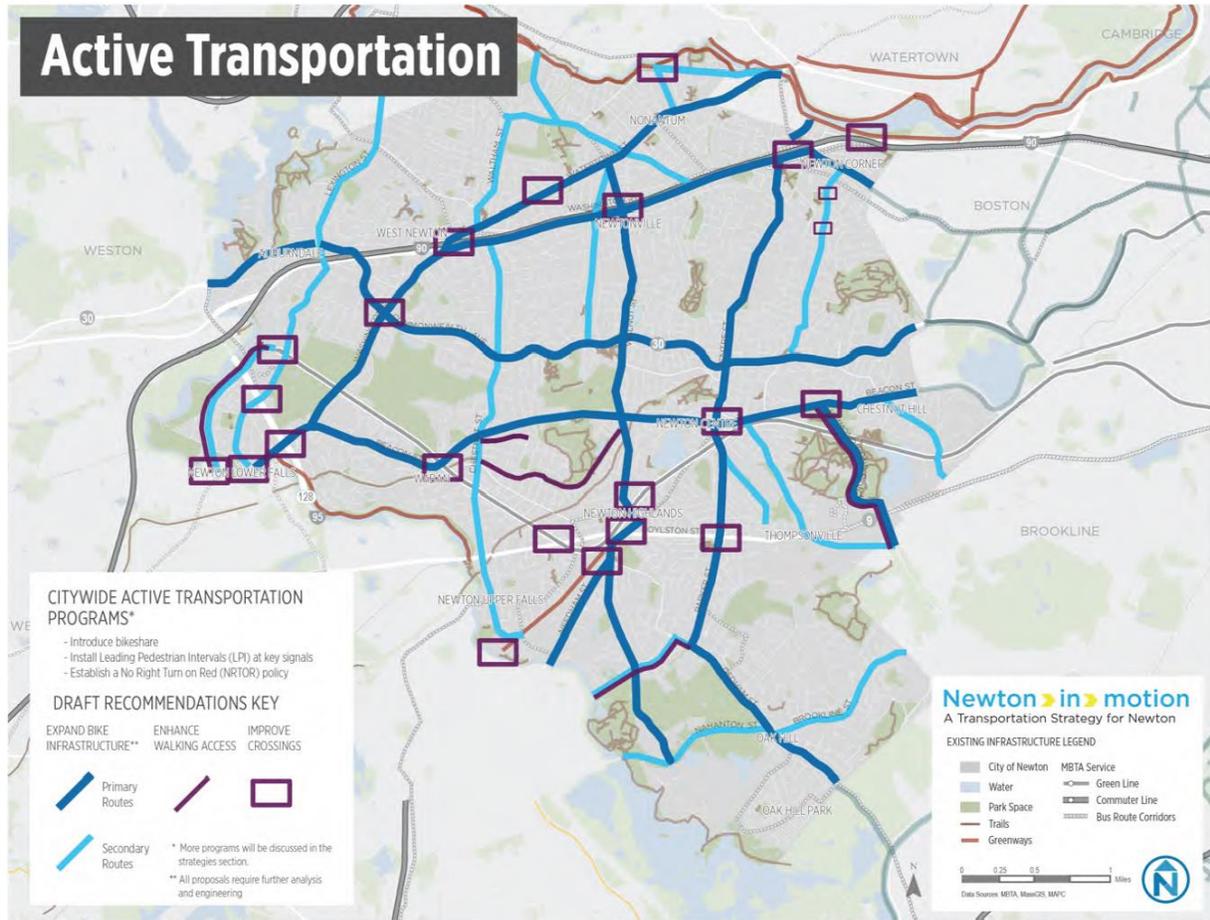
The City’s transportation strategy is organized by five priorities:

1. Safety: make the transportation network safe for all users
2. Transit and shared mobility: plan for a variety of shared transportation options
3. Active transportation: encourage walking and bicycling to support wider economic development, sustainability, and public health goals
4. Parking: actively manage parking to support business vitality and balance the need for driving access with traffic congestion reductions
5. Congestion reduction: Smart transportation, planning, and land use decisions will enable better travel decisions

Specific for the Riverside Greenway, Newton in Motion recommends a lane diet for Commonwealth Avenue and making it a priority route for active transportation.

Along the south side of the Charles River to MBTA Riverside, the plan recommends establishing a secondary active transportation route and enhancing walking access (see map below).

FIGURE 13 ACTIVE TRANSPORTATION STRATEGIES AND ACTIONS



2018 Newton Street Design Guide

Building off the 2016 Complete Streets Policy and the 2017 Newton in Motion transportation strategy, this Guide provides design and engineering guidance for all streets within the City. The guide focuses on safety by following four principles:

- Reduce speeds at conflict points by minimizing corner radii and implementing traffic calming elements, where appropriate.
- Minimize exposure to conflicts by reducing crossing distances and providing dedicated facilities for all modes, where feasible.
- Communicate right-of-way priority by applying consistent visual cues that reinforce desired yielding behavior.
- Ensure adequate sight distance by providing clear space in advance of crossings that “daylight” potential conflicts.

The Street Design Guide provides widths and design treatments that will be applied as recommendations for streets and street crossings are developed for the Riverside Greenway.

In Progress: MassDOT I-90 Bridge Rehabilitation, MassDOT Project #606783

The 2014 City of Newton Open Space and Recreation Plan notes that “when the Massachusetts Turnpike opened through Newton in 1964, it created a north/south divide in the City while also making portions of Newton more accessible by automobile.” Overcoming this obstacle is critical for the success of the Riverside Greenway. There is currently a project underway by MassDOT to widen and replace the deck of I-90 in the study area near Pigeon Hill. The project is in preliminary design.

There has been discussion about a path from Oakland Avenue down the slope to Charles Street, running parallel to the Pike at this location.

In Progress: Reconstruction of Pedestrian Bridge at Lasell Boathouse, MassDOT Project #609066

MassDOT is advancing the reconstruction of the bridge over the Charles River near the Lasell Boat House. (DCR owns the bridge.) This will facilitate crossing from Charles Street to the trail through the MWRA site that connects to Recreation Road. This project is in preliminary design.

In progress: MBTA Riverside Redevelopment

According to a 4/21/2018 *Boston Globe* article⁴, a 1.5 million square foot transit oriented development is being considered on the MBTA-owned land adjacent to the MBTA Riverside station and the hotel property directly to the west at the corner of Grove Street/Connector Road. The development would consist of housing, offices, shops, and hotel rooms. There is potential for the site to have its own access to I-95. Finding a way for the Riverside Greenway to connect to this site will be critical.

In progress: Two Bridges Trail Project

There will be a 25% design assessment of the two railroad bridges over the connector road and I-95 between the Riverside Station and Newton Lower Falls.

In progress: Pony Truss Path Restoration

The Appalachian Mountain Club in coordination with DCR is planning to restore the path on the eastern shore of the Charles River below the Riverside MBTA Station.

3. Site Analysis

A base map has been developed for the site analysis and shows topography, natural and cultural resources, and significant elements of the study area. The map indicates the resources and elements suggested in the *MassDOT Project Development and Design Guide*. This section describes the study

⁴ <https://www.bostonglobe.com/business/2018/04/21/developer-making-dramatic-changes-main-newton-corridor-one-property-time/BzHz211wyHe6Xi4J7k21IK/story.html>

area assets and barriers, bridges and underpasses, cultural and natural resources, roadways, and transit service.

3.1 Site Assets



A primary purpose of the Riverside Greenway is to connect people to the Charles River and its tranquil shoreline. In addition, there are numerous other assets in the study area, as shown in Figure 4.

Figure 4: Assets in and adjacent to the study area



3.2 Barriers and Opportunities

Commonwealth Avenue is an important connection between the Upper Charles and the Charles River Reservation. Commonwealth Avenue is an arterial roadway and provides access from I-95 and to Boston and Newton. There are no marked crossings on Commonwealth Avenue within the study area, and vehicle speeds are posted for 30-35 MPH. There are no bicycle facilities in the project area. There are missing sidewalks, and some sidewalks are in poor condition. Commonwealth Avenue's cross section varies considerably through this area, with a wide center median in the western portion and a parallel carriage road in the eastern portion.

I-90/MassPike is another barrier in the study area; as will be discussed below under Bridges and Underpasses, there are opportunities for people to walk or bike under it.

The MBTA Commuter Rail tracks also serve as a significant barrier. The historic Riverside Depot Pedestrian tunnel has been closed off. The nearest access across the rail tracks is Woodland Road. The tunnel is under consideration for improvement. A tunnel assessment is underway to understand the amount of work needed to reopen it for people.

While the Charles River is the primary asset of this area and the reason for exploring the Greenway, it needs to be crossed at some locations to provide access. Being able to cross the River between Recreation Road and the Riverside MBTA Station would be a useful connection.

3.3 Bridges and Underpasses

Figure 5 shows the bridges and underpasses in the study area. The numbers in the map correspond to the descriptions below.

Starting at the north end of the study area, Commonwealth Avenue passes over the Charles River via a bridge (#1) as shown in Figure 6. Since Commonwealth Avenue presents a barrier to people walking or biking, there may be an option to construct a boardwalk along the river and under this bridge. The feasibility of this opportunity will be assessed later on in this project.

There are two underpasses under I-90. The one at the end of Charles Street (#2) is used to access the Lasell College Stoller Boathouse as well as the park (Figure 7). There is another underpass (#3) to the west that is closed to the public (Figure 8). As noted above, there is a project underway that would reconstruct this section of the MassPike as part of the rehabilitation of the bridge, so MassDOT should consider options for people walking and biking to pass under this barrier.

There is a DCR-owned footbridge over the Charles River at the Lasell-Stoller Boathouse (#4) that is in very poor condition (Figure 9). MassDOT is rebuilding this bridge.

The Historic Riverside Depot Tunnel (#5) under the MBTA Commuter Rail tracks has been closed off but is under consideration for improvement (Figure 10). A tunnel assessment is underway as part of the Riverside Greenway Conceptual Plan to understand the amount of work needed to reopen it for people.

There is a newly constructed bridge (#6) extending from Recreation Road (Figure 11).

There is an exit ramp to I-90/MassPike and Commonwealth Avenue (Exits 23-24-25) from northbound I-95/Route 128 that merges with the I-95 on-ramp from Grove Street near the Riverside MBTA station. This 'mega ramp' becomes something of a connector road that also accesses Recreation Road. The connector road passes over the Charles River via a bridge (#7), and might present an opportunity to connect people from Grove Street and the Riverside MBTA Station to Recreation Road and other points north. This opportunity will be explored later on in this project.



Figure 5: Bridges and underpasses in the study area

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community





Figure 6: Underneath the Commonwealth Avenue Bridge



Figure 7: Charles Street Underpass



Figure 8: I-90 Underpass that is closed to the public



Figure 9: Bridge at Lasalle Boathouse





Figure 10: Historic Riverside Depot Tunnel





Figure 11: Foot bridge





Figure 12: Connector road bridge (source: Google Street View)

3.4 Cultural and Natural Resources

This section describes the cultural and natural resources that exist in the study area to establish an understanding of constraints and possible permitting needs for the Riverside Greenway. For cultural resources, natural resources, water and wetlands, and built environment, the following sections summarize the resource types in a table and illustrate their locations on supplementary maps.

Data sources include Geographic Information Systems (GIS) (including the City of Newton's GIS files), the MassGIS Online Mapping Tool (OLIVER), and online data published by state agencies.

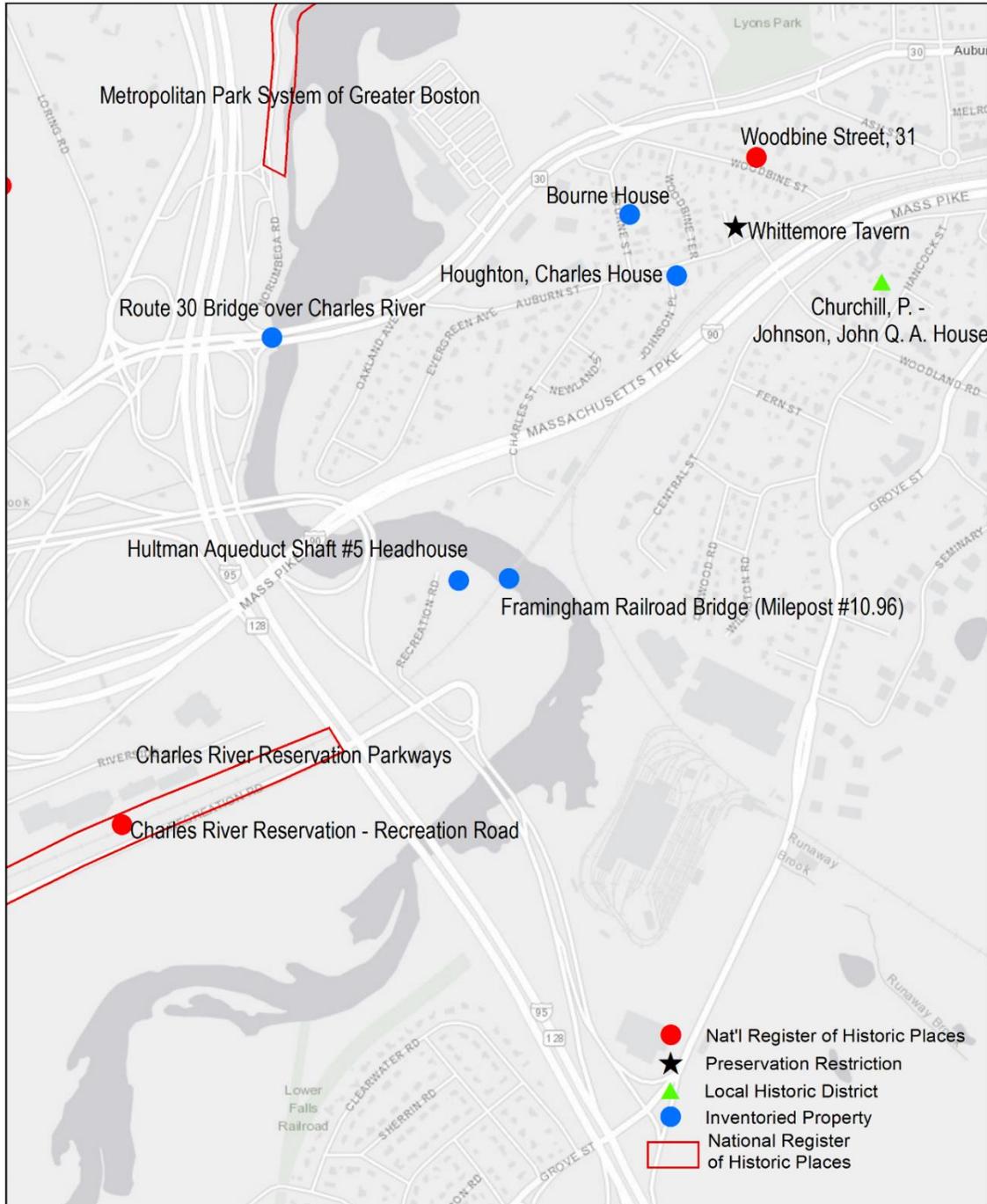
3.4.1 Cultural Resources

This section assesses historic and public resources in the study area. The purpose of this project is to connect open space and outdoor recreation areas, as described below. Some of the permits that transportation projects are typically subject to include:

- Section 4(f) of 1966 US DOT Act (this requires FHWA approval for any federal-aid highway project using land from a publicly-owned park, recreation area, historic property, or wildlife and waterfowl refuge) Section 106 of the National Historic Preservation Act and Chapter 254 of the Massachusetts Historical Commission (these involve projects that impact historic sites; often satisfying Section 106 will satisfy Chapter 254 as well)

Table 1: Cultural Resources

Resource	Status	Data Source
<p>Historic</p> <ul style="list-style-type: none"> - Known historically significant buildings/ structures - Historic district boundaries - Historical/locally significant monuments and markers - Historic/Archaeology – Federal Section 106 and State Chapter 254 	<ul style="list-style-type: none"> - See Figure 13 - There are resources in the area, but the Riverside Greenway is not anticipated to impact them. - There is an historic district south and east of the Commuter Rail tracks, but the Greenway is not anticipated to impact it. - There are historic properties along Oakland Avenue, Bourne Street, Charles Street, and Woodbine Street, but the Greenway is not anticipated to impact them. 	<ul style="list-style-type: none"> - GIS: MA Historic Commission. City of Newton
<p>Massachusetts Protected Open Space and Outdoor Recreation Areas</p>	<ul style="list-style-type: none"> - See Figure 14 - DCR owns the area south and east of Recreation Road, and the Reservation lands north of Commonwealth Ave. - The state and Lasell College own the property where the Stoller Boathouse stands. 	<ul style="list-style-type: none"> - MassGIS



Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community

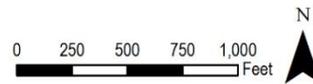


Figure 13: Historic resources

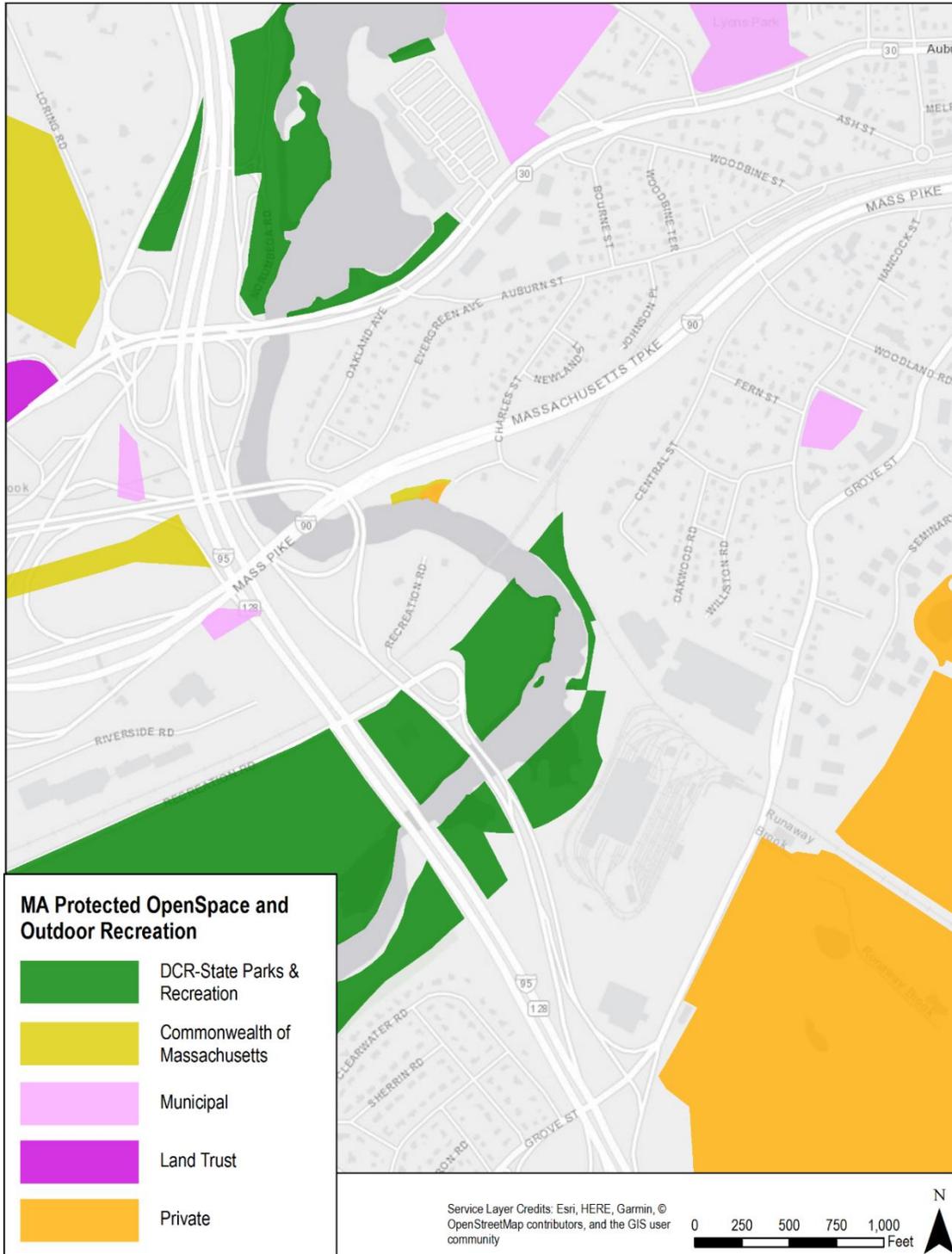


Figure 14: MA Protected Open Space and Outdoor Recreation

3.4.2 Natural Resources

This section describes the natural resources in the area in an effort to estimate constraints that may be encountered during permitting. There are no Areas of Critical Environmental Concern, endangered species, or municipal conservation restrictions, so it is unlikely that the project will have to be reviewed by the Natural Heritage & Endangered Species Program (NHESP) for the Massachusetts Endangered Species Act (MESA), or by the Department of Conservation and Recreation on behalf of the ACEC Program. There are some naturally occurring hills which may be challenging for some bicyclists.

Table 2: Natural Resources

Resource	Status	Data Source
Areas of Critical Environmental Concern	- None	- OLIVER
Natural Heritage & Endangered Species Program (NHESP)	- No Priority Habitats - No Estimated Habitats - No Natural Communities - No Certified Vernal Pools	- GIS: NHESP Data Layers - OLIVER
Topography/ elevation contours	- See Figure 15 - Pigeon Hill crests at the south end of Oakland Ave near the MassPike. - There is a significant hill on the western end of Central Street between the Commuter Rail tracks and the Riverside MBTA station.	- ESRI - 1-foot contours available from the City of Newton
Conservation Restrictions	- There is a Conservation Commission Wetland Filing at 1 Riverside Road adjacent to the DCR property and across the street from the Lasell Boat House.	- GIS: City of Newton



Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, ©

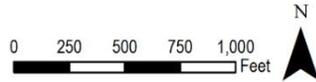


Figure 15: Topography

3.4.3 Built Environment

This section indicates that much of the land on which a Greenway would be built is owned by the Commonwealth. As the project progresses towards design, engineers will look for ways to minimize conflicts with existing utilities, such as poles, which would require relocation.

Table 3: Built Environment

Resource	Status	Data Source
Bridges	- Bridges described in Section 3.3	- Fieldwork -
MassDEP Tier Classified Oil and/or Hazardous Material Sites (MGL c. 21E)	- None	- GIS: MassDEP
Underground storage tanks	- One at the Hess at the Comm Ave Auburn St intersection (not likely to be impacted by the Greenway)	- OLIVER
Parcel data	- Figure 16 - In Figure 17, there is a sewer easement along the south/eastern shore of the Charles River adjacent to the Riverside MBTA Station for the Two Bridges Trail. There is a drainage easement traversing the Riverside MBTA Station.	- GIS: City of Newton, Town of Weston
Above-ground utilities	- Utility poles shown in Figure 18	- GIS City of Newton

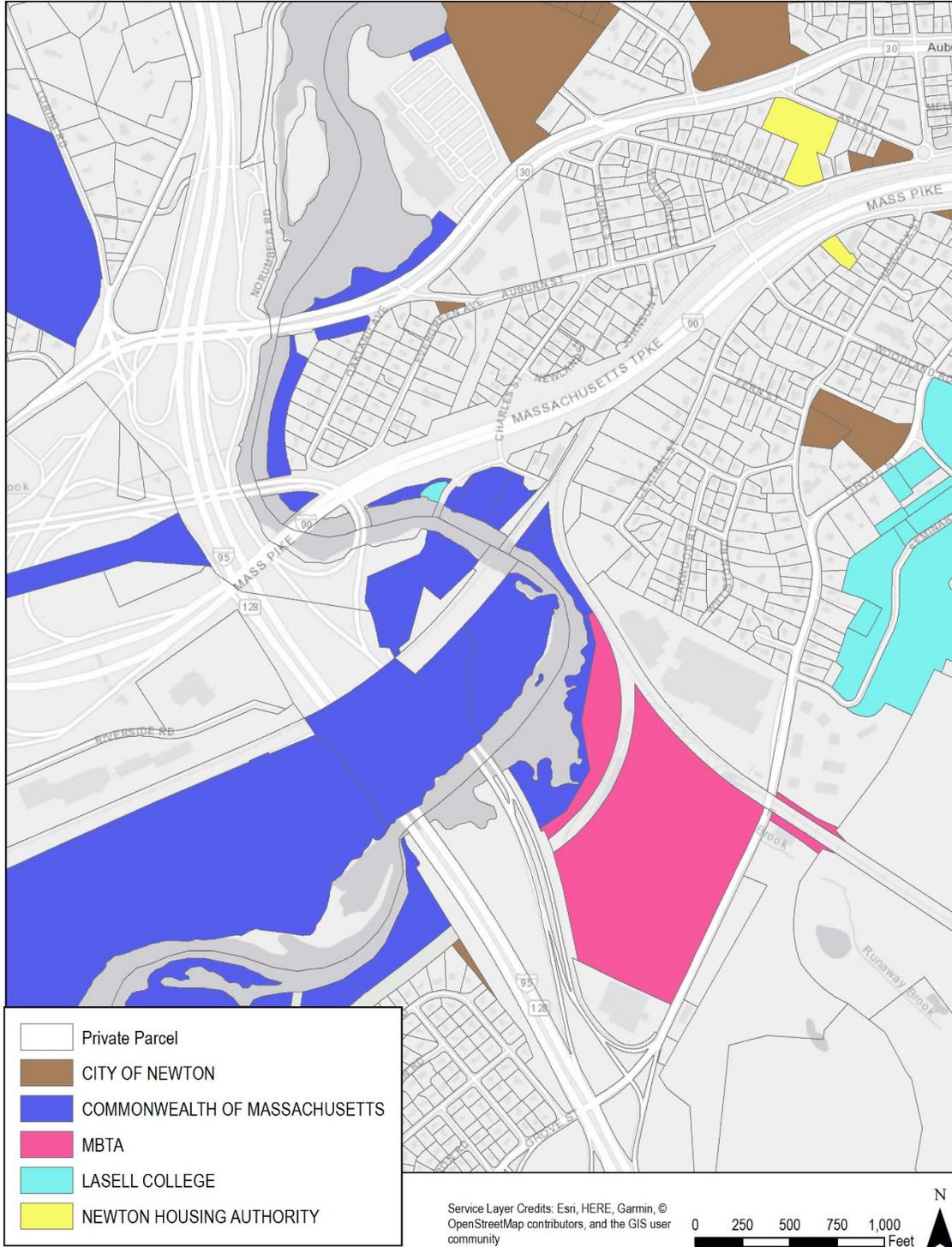


Figure 16: Parcels



Figure 17: Easements near the MBTA Riverside Station (City of Newton GIS Browser)

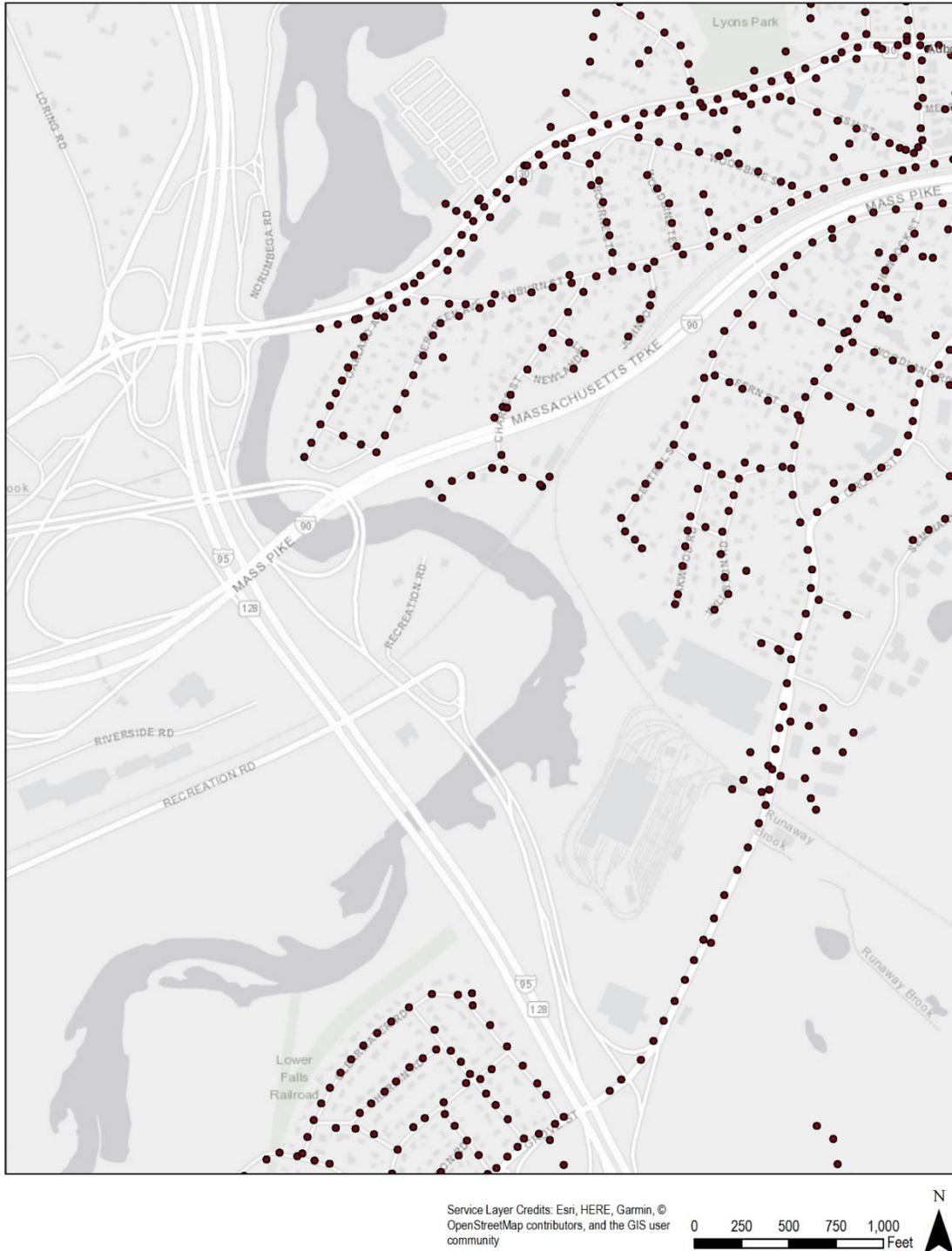


Figure 18: Utility poles

3.4.4 Water and Wetlands

This section describes the water and wetlands resources in the area. Proposed Greenway alignments will avoid these areas as much as possible and suggest minimal impact facility types (i.e. boardwalks) in areas that encounter them. Some of the permits that transportation projects are typically subject to include:

- Section 404 of the 1972 Clean Water Act (this is administered by the US Army Corps of Engineers and involves all wetlands and waters in the US)
- Section 401 of the 1972 Clean Water Act (this is a water quality certification required by the Massachusetts Department of Environmental Protection)
- National Pollutant Discharge Elimination System (NPDES) Construction General Permit (this is administered by the US Environmental Protection Agency (EPA) and regulates the discharge of pollutants through pipes and ditches)
- Massachusetts Wetland Protection Act MGL Chapter 131, Section 40 (this requires a buffer zone of 100 feet from a wetland and may involve the local conservation commission)
- The Rivers Protection Act (according to the *Massachusetts Project Development and Design Guide*, this act “establishes the policy of the state to protect the natural integrity of rivers and to encourage and establish open space along rivers”)
- Chapter 91 Waterways license (this applies to certain rivers and is administered by the MassDOT Environmental Section)

Table 4: Water and Wetlands

Resource	Status	Data Source
Wetland resource areas, including the one-year flood line of water bodies	<ul style="list-style-type: none"> - See Figure 19 - There are wetlands adjacent to the Charles River, west of the Riverside MBTA station. 	<ul style="list-style-type: none"> - GIS: MassDEP Wetlands Layer - OLIVER
Federal Emergency Management Administration (FEMA) floodplain	<ul style="list-style-type: none"> - See Figure 20 - The floodplain shown indicates the 1% annual chance flood. - There are lands in Newton subject to the Massachusetts Rivers Protection Act. This does not require a separate permit but does require the project applicant “to demonstrate that the project has no practicable alternative and will not have significant adverse impacts.” 	<ul style="list-style-type: none"> - GIS: MassDEP Wetlands Layer - Rivers Protection Act https://www.mass.gov/files/documents/2018/04/17/about-rpa.pdf

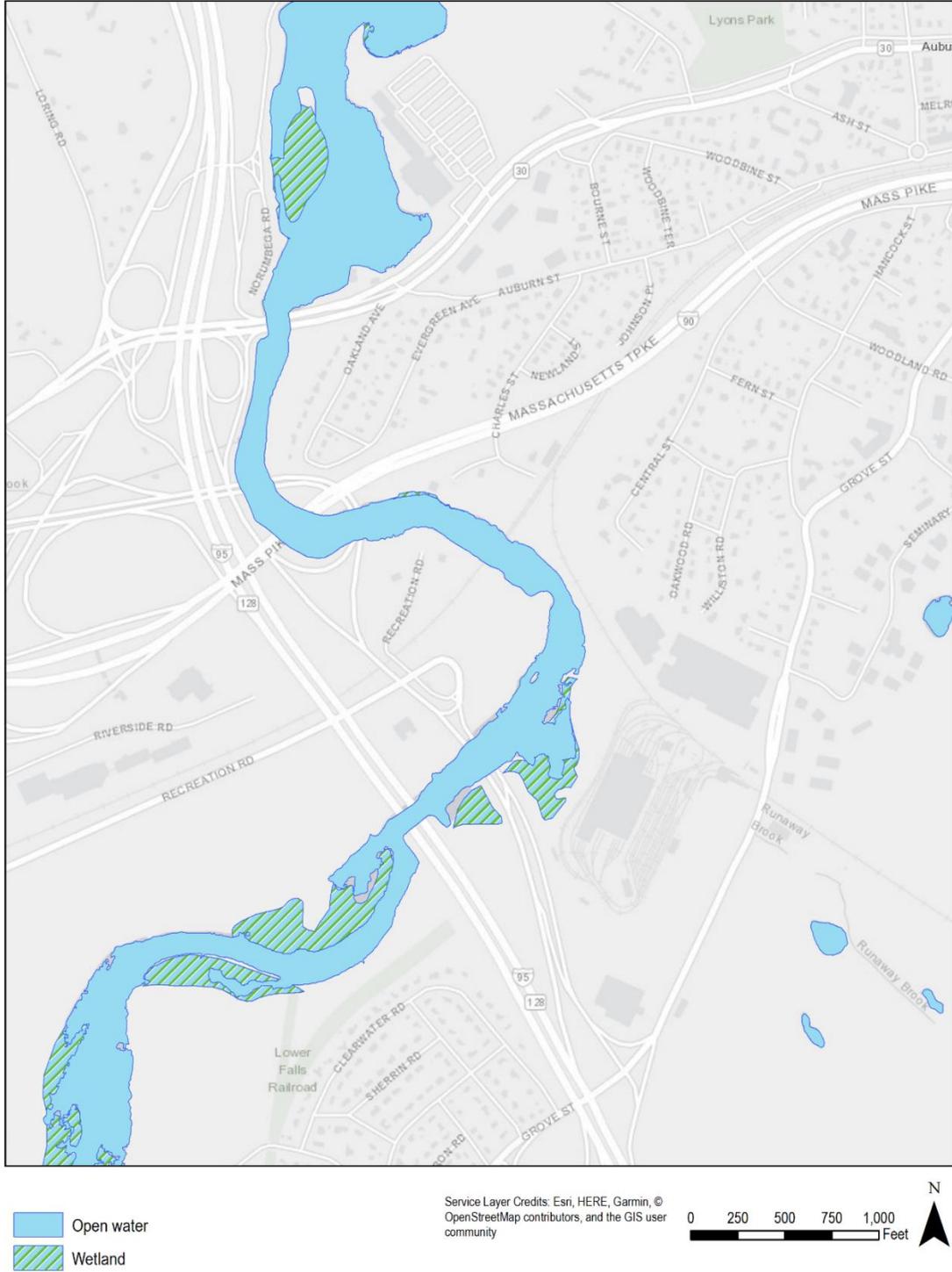


Figure 19: Water and wetlands

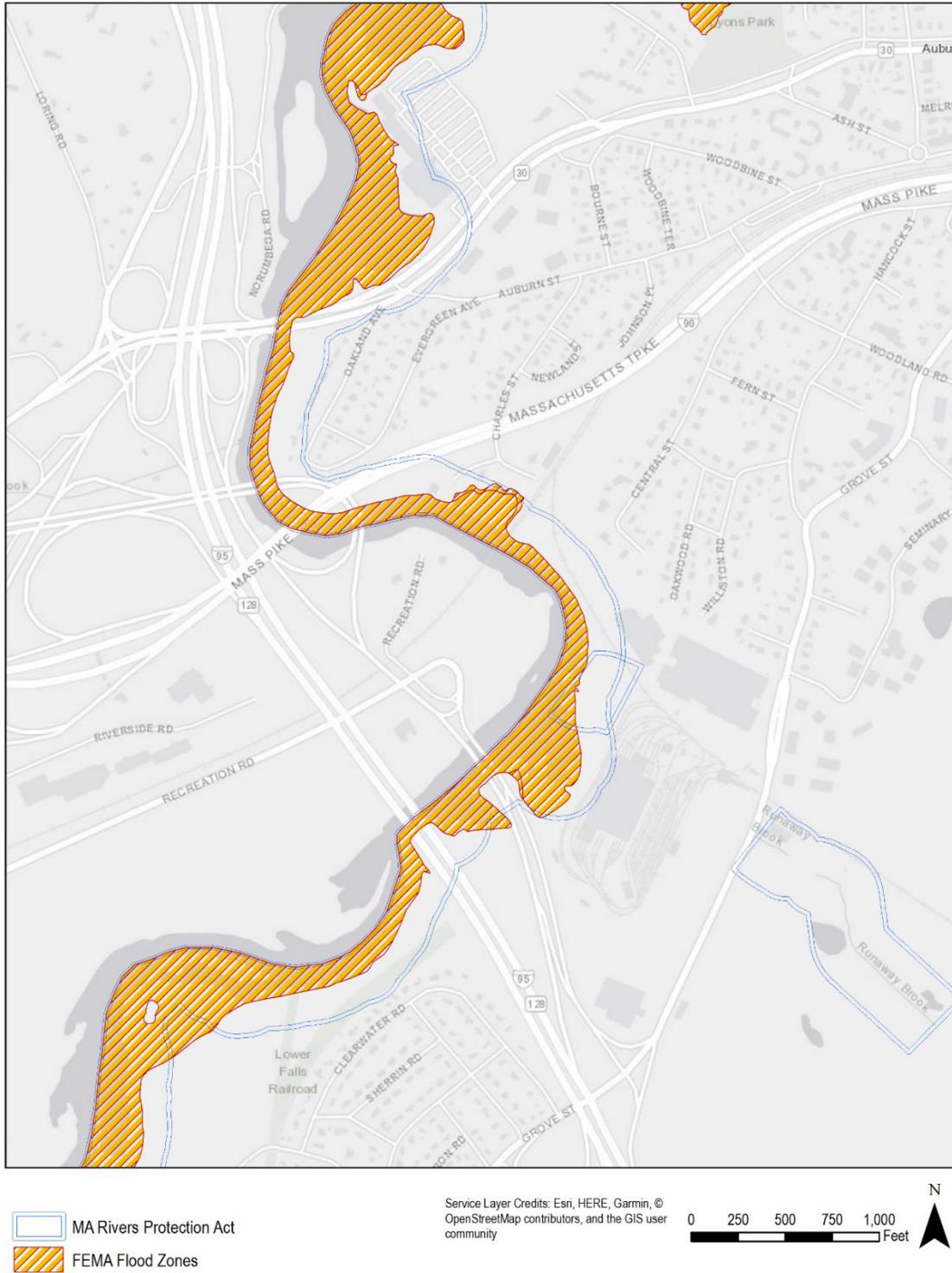


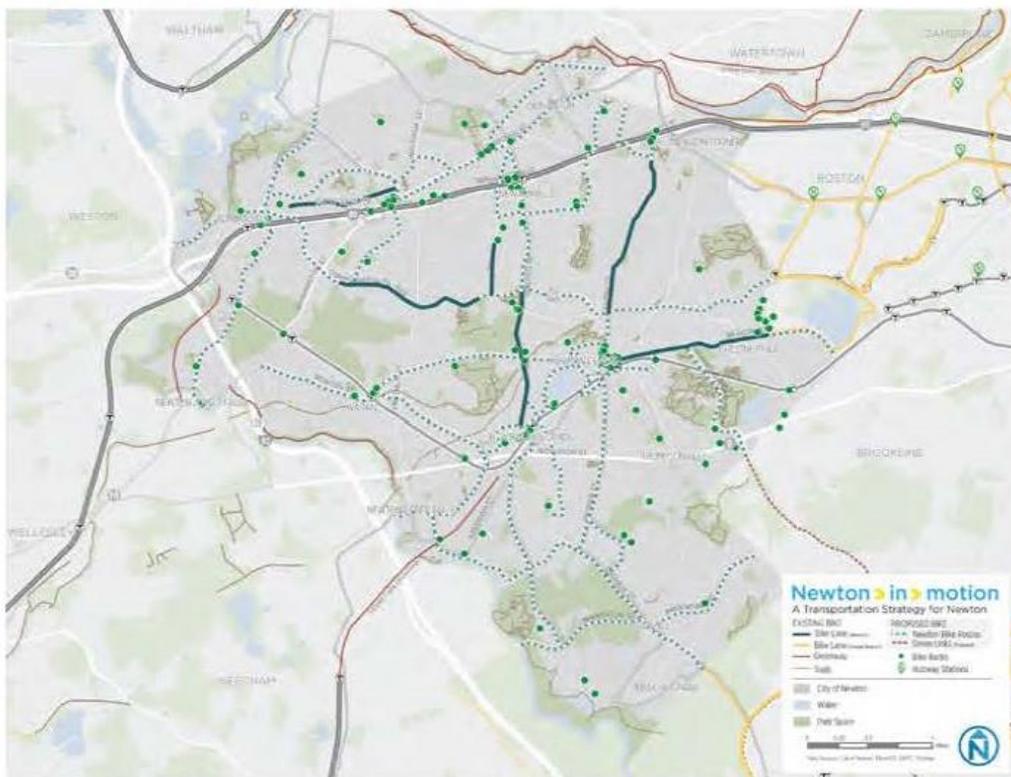
Figure 20: FEMA flood zones and Rivers Protection Act boundary

3.5 Streets

This section summarizes available traffic data for Commonwealth Avenue, the roads in the Pigeon Hill neighborhood, Recreation Road, and the connector road. Crash data from the MassDOT Crash Portal is also summarized below. There are no Highway Safety Improvement Program (HSIP) crash clusters in the study area (except for some locations on interstate facilities, which does not affect the Greenway).

3.5.1 Bicycles

Newton Leads 2040 Transportation Strategy (below) shows proposed bike routes along Commonwealth Avenue and along Grove Street, connecting to the rest of the envisioned city network.



3.5.2 Traffic Data

Table 5 shows the traffic data available for the roads in the study area. The study team will meet with the City of Newton to discuss any upcoming plans for Commonwealth Avenue or the roads in the Pigeon Hill neighborhood, and with MassDOT to discuss options for the connector road. Figure 21 through Figure 24 show the various cross sections of Commonwealth Avenue. Options for crossing and walking and biking along Commonwealth Avenue will be considered in the next phase of this study.

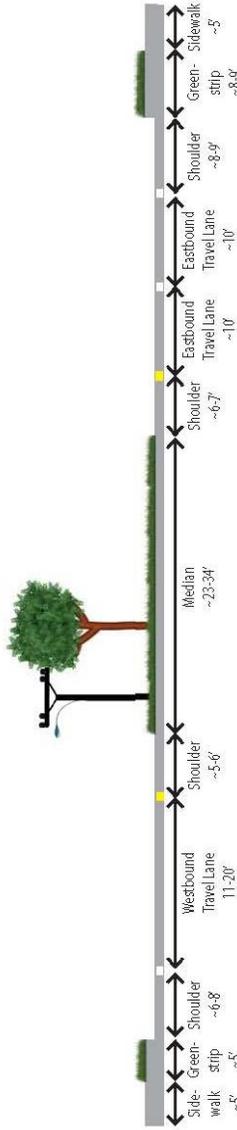
Table 5: Traffic Data

Street	Jurisdiction	Functional Class	Average Annual Daily Traffic (year collected)	Posted Speed Limit	R/W width	Number of through lanes and approximate width
Commonwealth Avenue	City of Newton	Principal Arterial	(West of Auburn St) 22,905 (2017) Northbound: 11,883 Southbound: 11,022	35/30	~120'	# of lanes vary – 11'-15'
			(East of Auburn St) 18,653 (2017) Northbound: 11,305 Southbound: 10,803			
Pigeon Hill Neighborhood (various)	City of Newton	Local	Not available	30	~35'-40'	Two 10'-lanes
Recreation Road	DCR	Local	Not available	Not posted	N/A-part of adjacent DCR property	Two 10'-lanes
connector road	MassDOT	Interstate	782 (2007)	Not posted	~30'	One of variable width (15'-21')



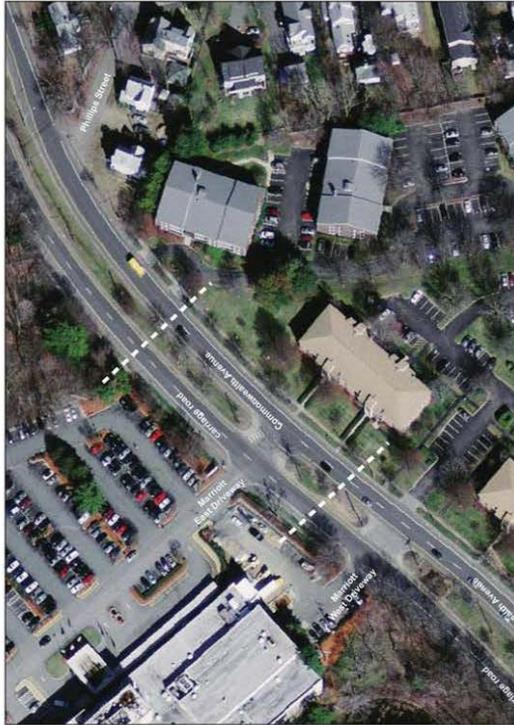
**Commonwealth Avenue:
Auburn Street to mid-way
between Marriott driveways**

Cross sections looking east
NOT TO SCALE
Posted speed limit: 35 MPH
No on-street parking
Intermittent curb



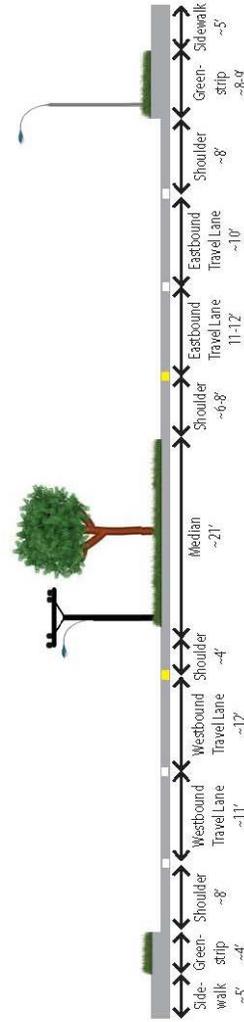
Existing:
1 westbound
travel lane and 2
eastbound travel
lanes divided by
median

Figure 21: Comm Ave from Auburn Street to Marriott



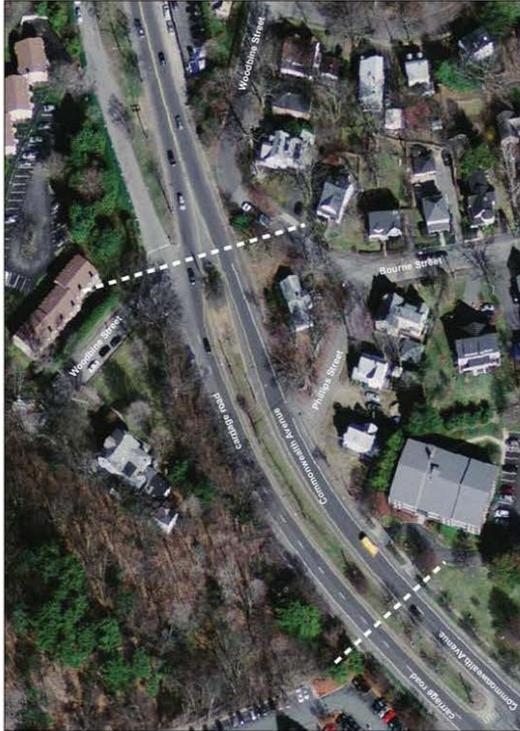
Commonwealth Avenue:
mid-way between Marriott driveways
to conservation area

Cross sections looking east
NOT TO SCALE
Posted speed limit: 35 MPH
No on-street parking
Curbed



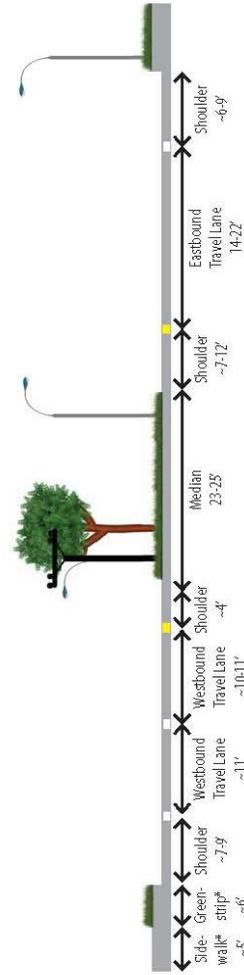
Existing:
2 westbound
travel lanes and 2
eastbound travel
lanes divided by
median

Figure 22: Comm Ave from Marriott to conservation area



**Commonwealth Avenue:
conservation area to Woodbine Street**

- Gross sections looking east
NOT TO SCALE
- Posted speed limit: 35 MPH
- No on-street parking
- Intermittent curb



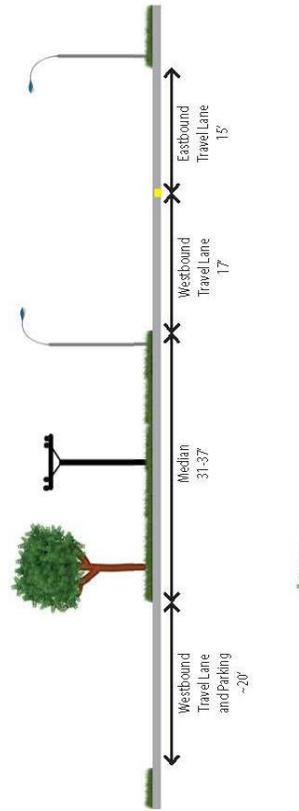
Existing:
2 westbound
travel lanes and 1
eastbound travel
lane divided by
median

Figure 23: Comm Ave from conservation area to Woodbine Street



**Commonwealth Avenue:
Woodbine Street to Islington Road**

- Gross sections looking east
NOT TO SCALE
- Posted speed limit: 35 MPH
- On-street parking
- Intermittent curb



Existing:
Westbound carriage road with parking; east and westbound travel lanes on southeast side of median

Figure 24: Comm Ave from Woodbine Street to Islington Road

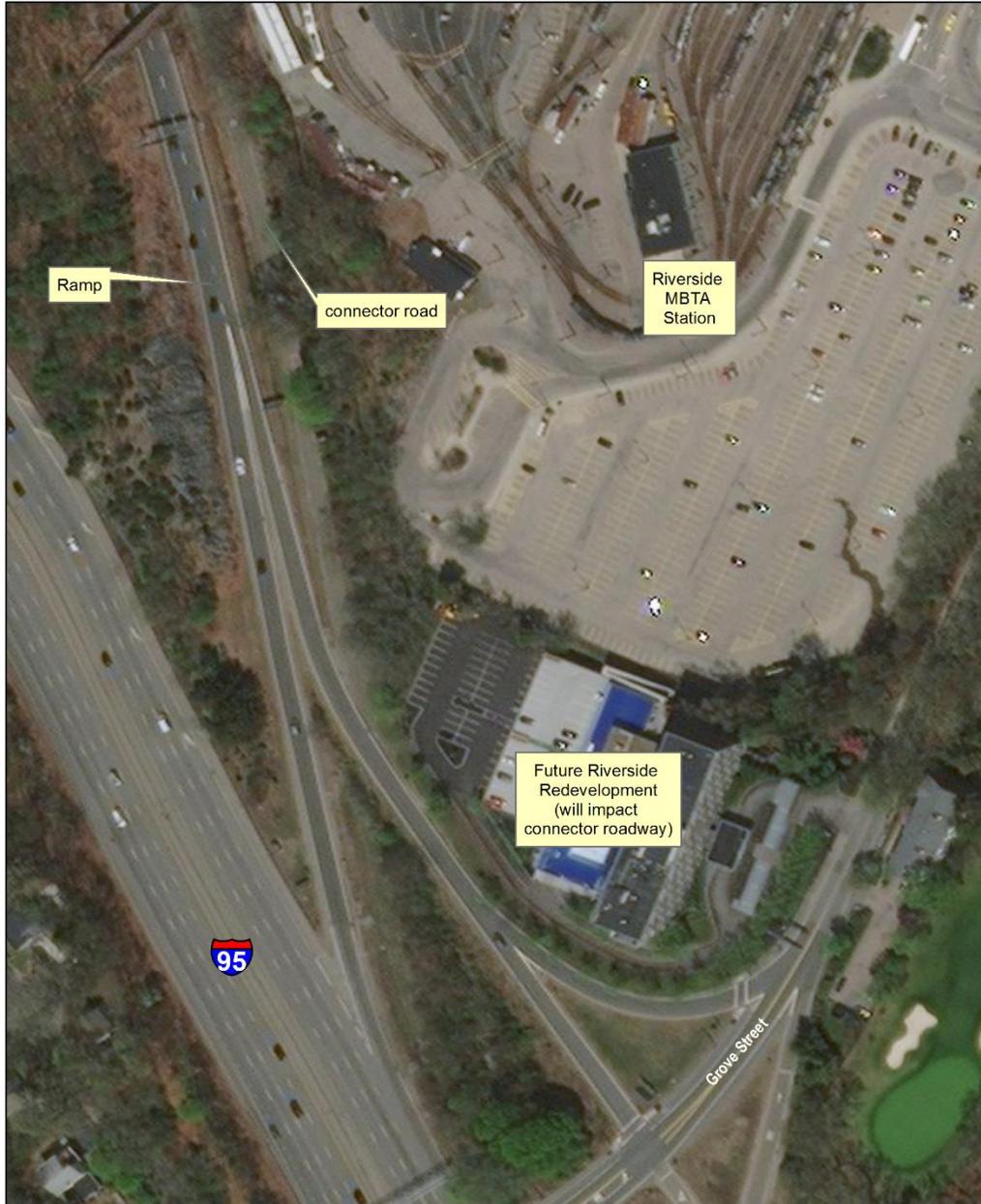
The “connector road” serves a dual purpose as both an off-ramp from I-95/on-ramp to the Pike, and a northbound connection from Grove Street to Recreation Road. It separates from the ramp portion about 475’ north of Grove Street and runs parallel to the ramp. The connector road then crosses the Charles River and intersects a trailhead and Recreation Road. The connector road is shown in Figure 25 and Figure 26. Because of this parallel but separate configuration, MassDOT may be willing to explore options for the connector road to serve people walking and biking.



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OpenStreetMap contributors, and the GIS user
community
Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS,



Figure 25: Northern half of "connector road"(note that the trees obscure the view of the connector road in the southern part of this figure and that the road continues parallel but separate from ramp)



Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,

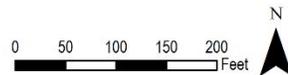


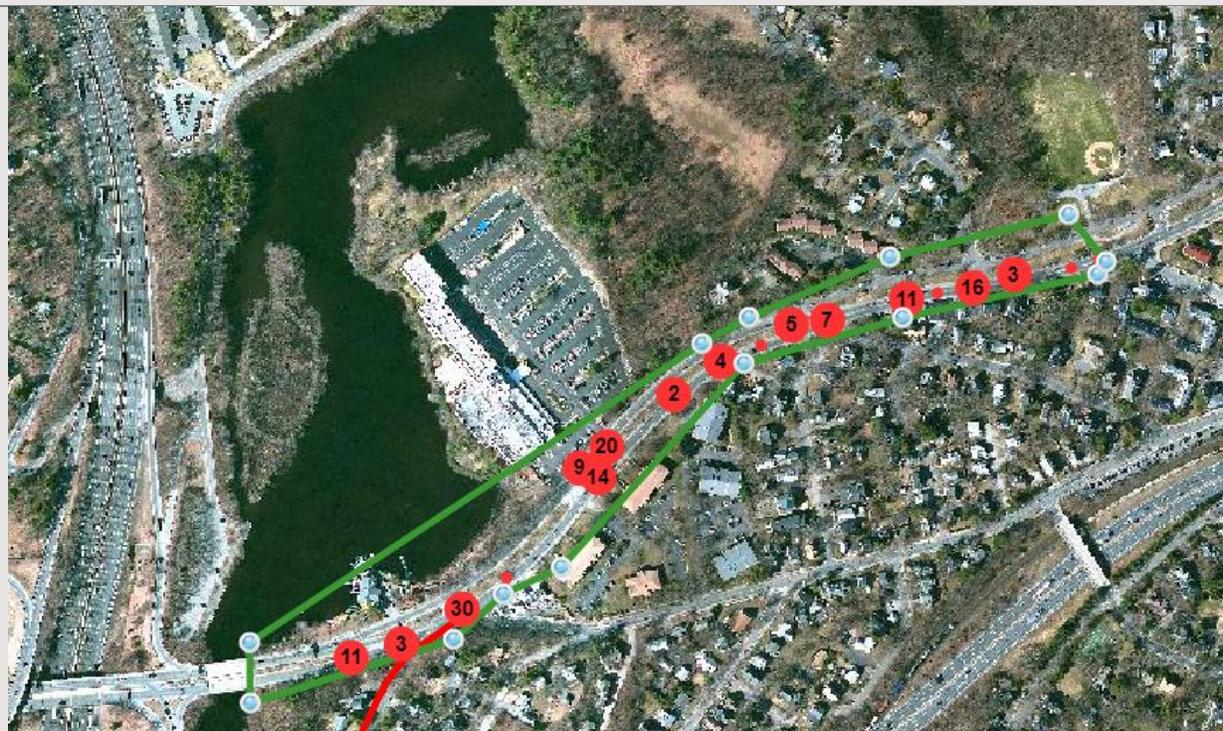
Figure 26: Southern half of "connector road"

3.5.3 Crash Data

The following tables summarize data from the MassDOT Crash Portal, including screenshots of the geo-located crashes. Each red dot symbolizes one or more crashes (the number on the large dot indicates the number of crashes that have occurred at that location). The green line indicates the area queried on the portal.

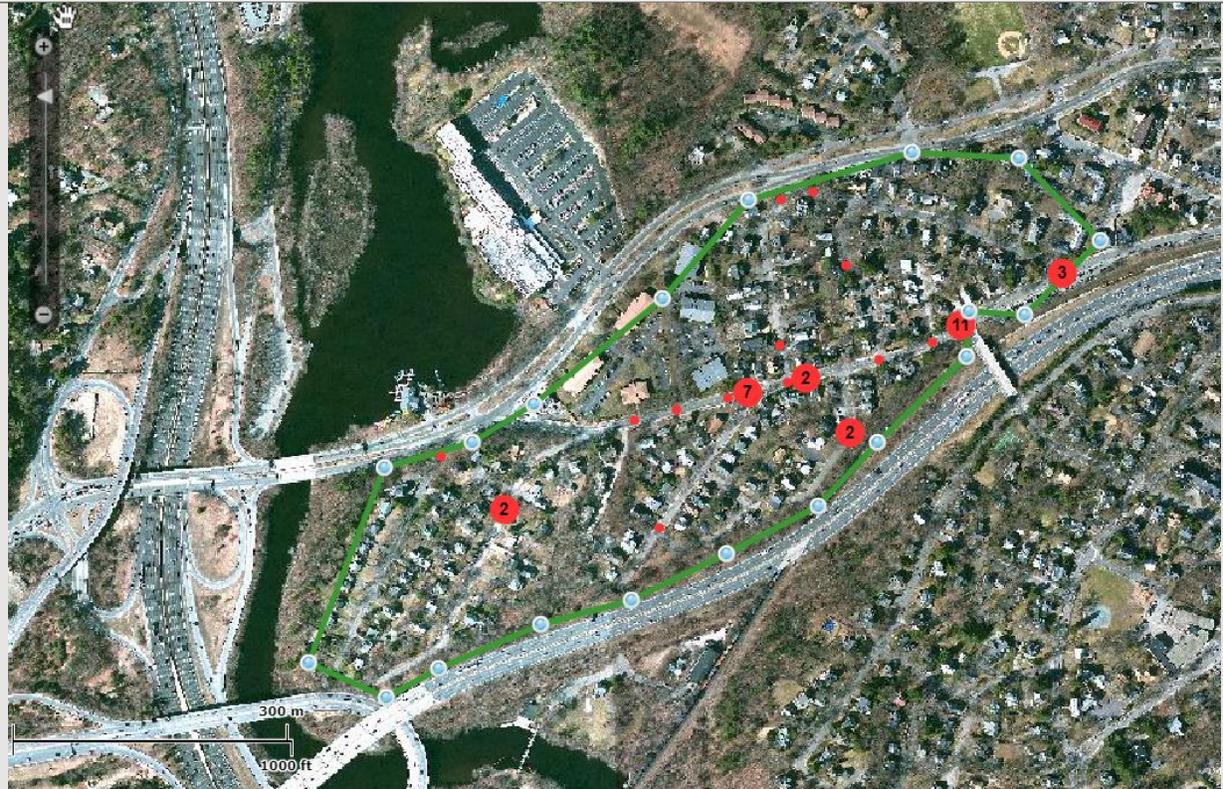
Commonwealth Avenue

- 139 Reported Crashes Between 2001-2015
- 36 Reported Crashes from 2013-2015
- 4 of the 36 were reported non-fatal injuries
- 26 of the 36 were reported property damage only (none injured)
- 6 of the 36 were not reported
- Most crashes occur at the Marriott driveway, followed by the Auburn Street intersection.



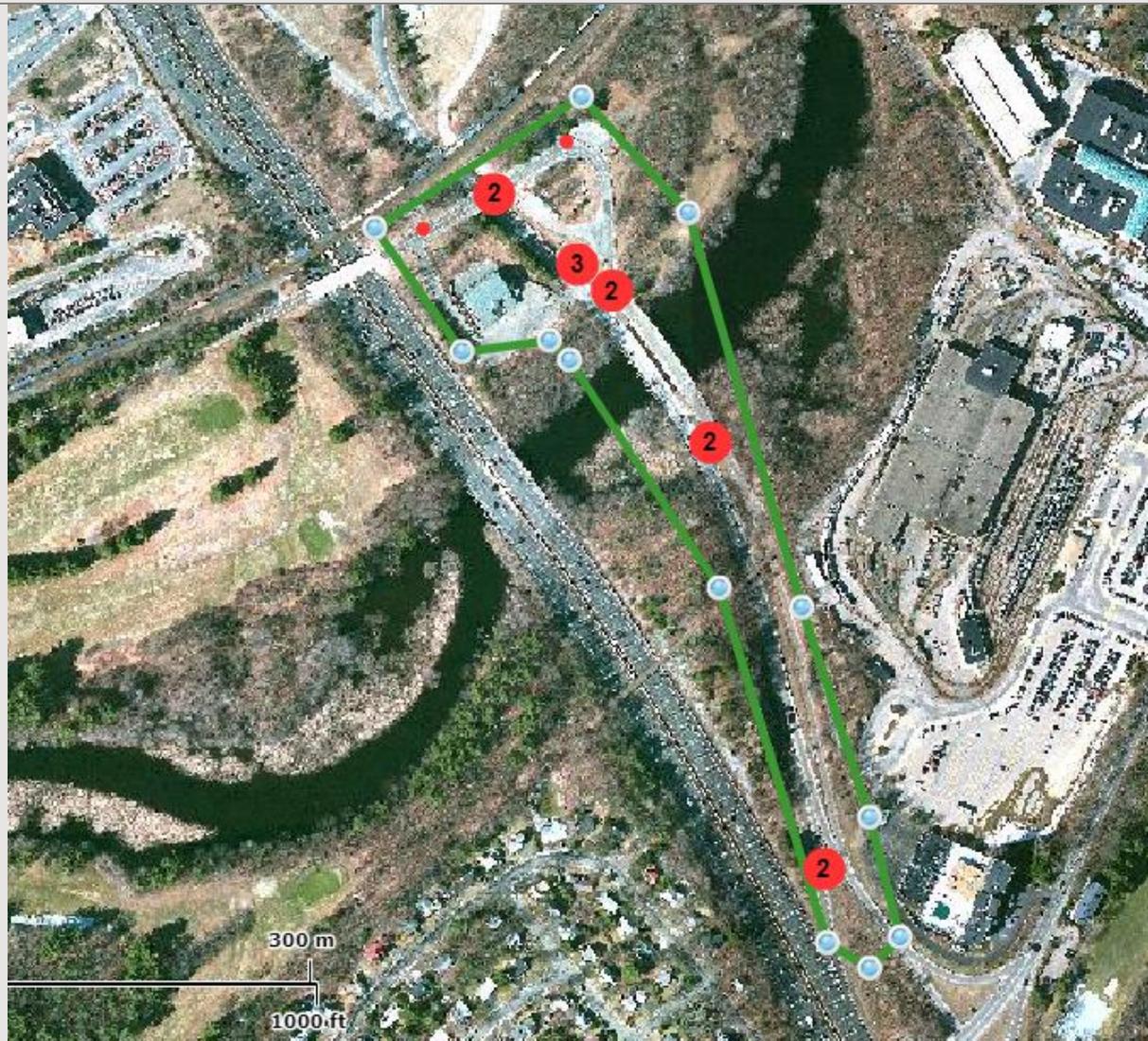
Pigeon Hill Neighborhood

- 40 Reported Crashes Between 2002-2014
- 8 Reported Crashes Between 2013-2014
- 1 of the 8 Crashes were reported Non-Fatal Injury
- 4 of the 8 Crashes were reported Property Damage Only (none injured)
- 3 of the 8 crashes were not reported



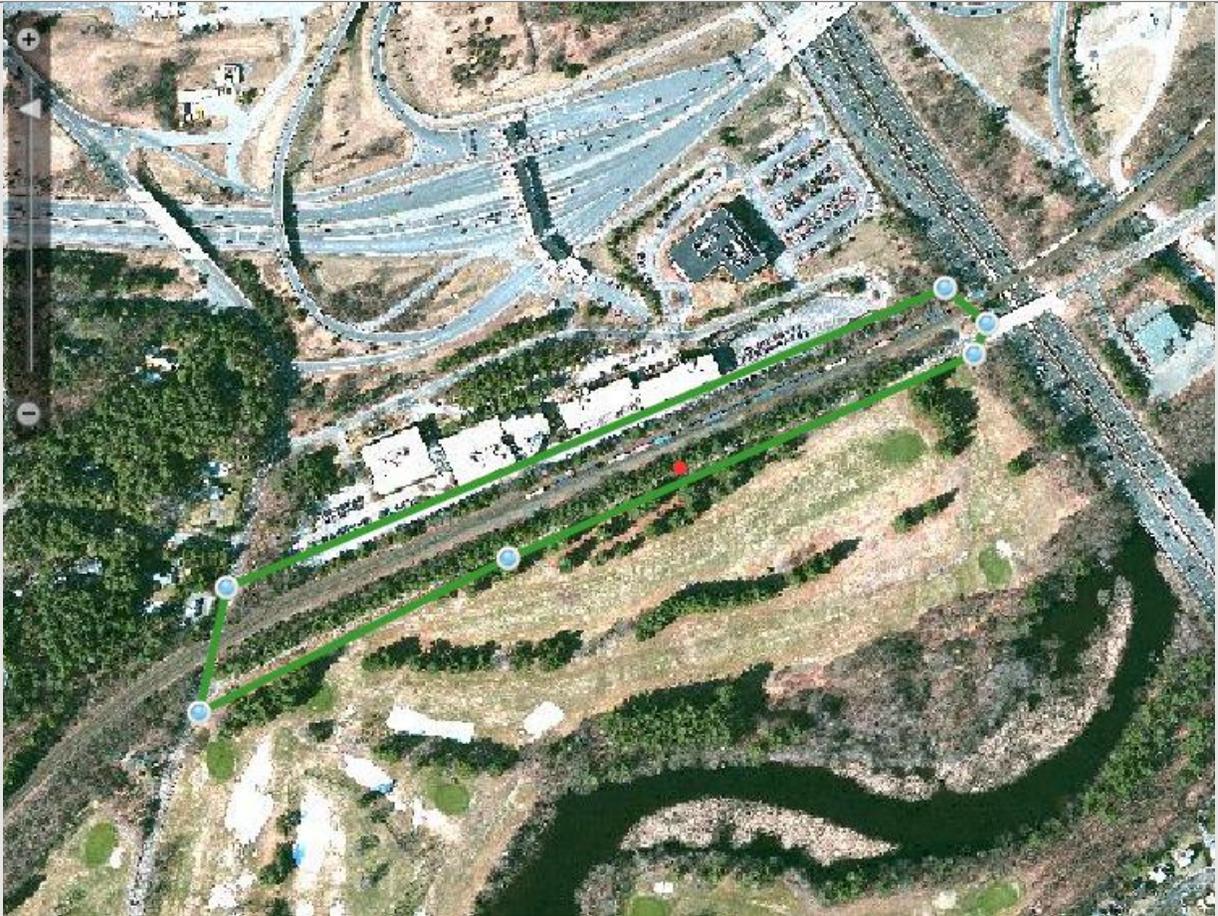
connector road

- 13 Reported Crashes Between 2004-2015
- 7 Reported Crashes Between 2013-2015
- 1 of the 7 Crashes was reported Non-Fatal Injury
- 6 of the 7 Crashes were reported Property Damage Only (none injured)



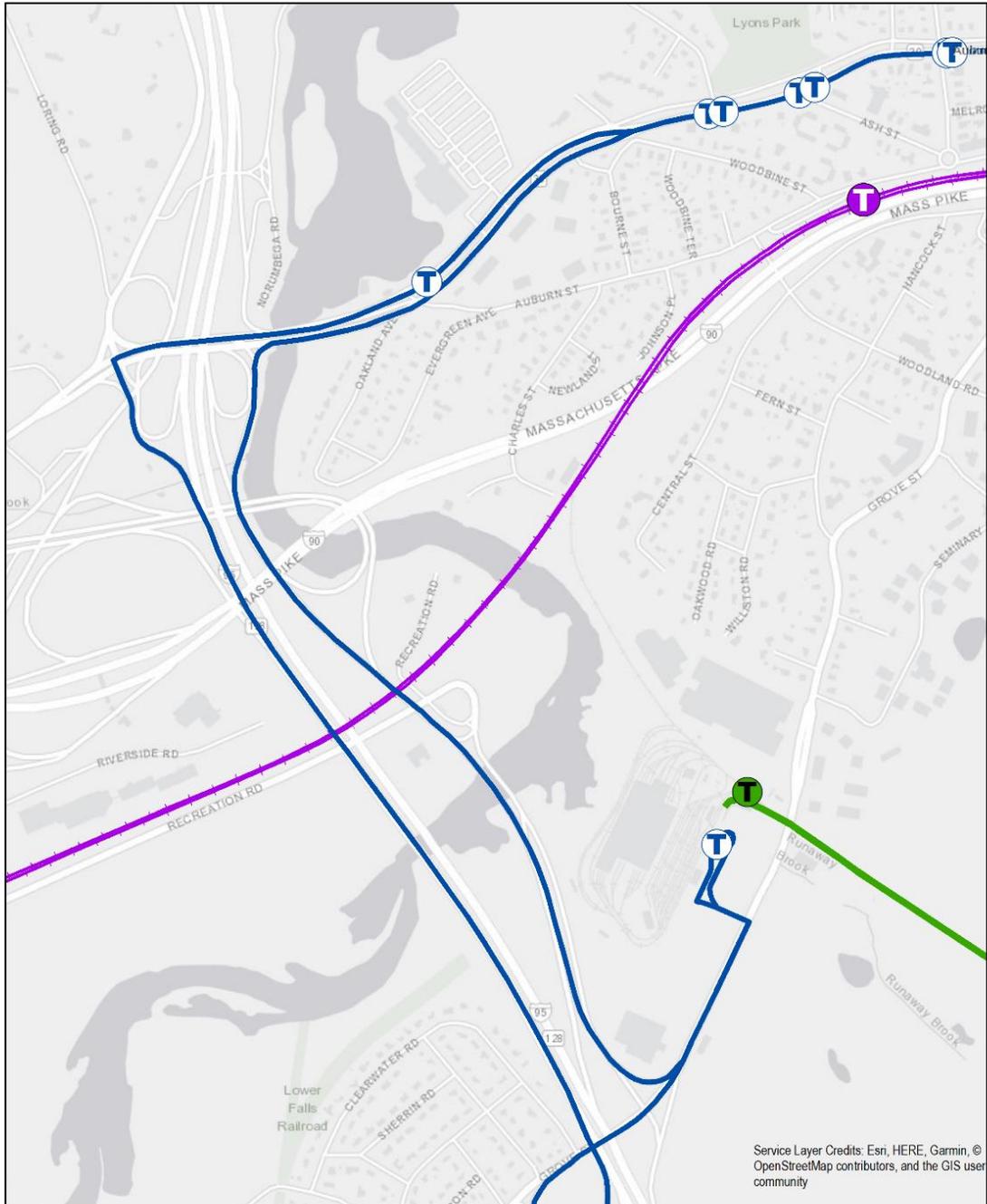
Recreation Road

- 1 Reported Crash in 2004
- Crash was reported as Property Damage Only



3.6 Transit

As shown in Figure 27, the D-Branch of the Green Line ends at Riverside in the southeast of the study area. The Framingham/Worcester Commuter Rail stops at Auburndale to the east of the study area, and MBTA Route 558 serves Comm Ave and the Riverside MBTA station.



-  MBTA Bus Stop
-  MBTA Commuter Rail Station
-  MBTA Green Line Station
-  MBTA Bus Route 558
-  MBTA Worcester Commuter Rail
-  MBTA Green Line-D Branch

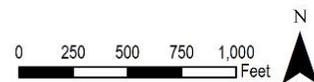


Figure 27: Transit in the study area

4. Alternative Routes

Figure 28 illustrates potential routes for the Riverside Greenway to connect to existing trails and resources (i.e., the river, site assets, and transit) in the area.



Figure 28: Alternative routes

5. Community Input

The Riverside Greenway Working Group is comprised of representatives from Bike Newton, Newton Conservators, the Newton neighborhoods local to the study area (Auburndale and Lower Falls), and the Solomon Foundation. The Working Group ensures that the study stays true to the project goals and reflects the spirit of Newton and the regional greenway network.



The Riverside Greenway Working Group met with the study team on June 1, 2018 to walk the study area and discuss opportunities and constraints. A summary of this meeting is attached, and the findings are incorporated into the overall document.

A community meeting was held on September 17, 2018 at the Auburndale Community Library. A summary of this meeting is attached to this report and the discussion focused on four main points:

1. Connections and access throughout the study area, particularly to the Charles River and to the MBTA Riverside T station
2. Crossing Commonwealth Avenue safely
3. Making use of Commonwealth Avenue's Carriage Lanes for people walking, running, biking, etc.
4. Calming traffic to improve safety for all users

6. Conclusions and Next Steps

The vision and goals for the Riverside Greenway builds on other past initiatives completed for the Charles River and the Lakes District area:

Vision

Link communities and bring people together to share in a common natural resource.

Goals

- Improve access to the river and/or greenway for people walking, biking, or taking part in other activities
- Improve circulation and open-space connections along the river corridor
- Protect and enhance the character of open space and the shoreline along the River
- Protect and improve visual/scenic quality
- Limit potential conflicts between activities

This memorandum presents an assessment of existing conditions to establish an understanding of potential constraints and resources that would need to be addressed in order to advance the Greenway.

Findings

- Approximately 180,000 people live within 5 miles of the Riverside Greenway study area. It is well-served by transit and thereby accessible to many more people beyond the immediate area.
- A primary purpose of the Riverside Greenway is to connect people to the Charles River and its tranquil shoreline. In addition, there are numerous other assets in the study area which the Greenway would connect. It would enable people enjoying the Blue Heron Paths in Lyons Park to walk or bike to the facilities at the Leo J. Martin Golf Course, to the Riverside MBTA Station, or to Newton Lower Falls.
- The D-Branch of the Green Line ends at Riverside in the southeast of the study area. The Framingham/Worcester Commuter Rail stops at Auburndale to the east of the study area, and MBTA Route 558 serves Comm Ave and the Riverside MBTA station.
- Commonwealth Avenue is an important connection between the Upper Charles and the Charles River Reservation, but is also a major barrier. Commonwealth Avenue is an arterial roadway and provides access from I-95 and to Boston and Newton. There are no bicycle facilities in the project area. There are missing sidewalks, and some sidewalks are in poor condition. Commonwealth Avenue's cross section varies considerably through this area, with a wide center median in the western portion and a parallel carriage road in the eastern portion.

- The historic Riverside Depot Pedestrian tunnel is closed off and is under consideration for improvement. A tunnel assessment is underway to understand the amount of work needed to reopen it for people.
- There are two underpasses under I-90. The one at the end of Charles Street is used to access the Lasell College Stoller Boathouse as well as the park. There is another underpass to the west that is closed to the public; however, there is a project underway to reconstruct this section of the MassPike, so MassDOT should consider options to improve the conditions for people walking and biking to pass under this barrier.
- There are historic resources in the area, but the Riverside Greenway is not anticipated to impact them.
- There are no Areas of Critical Environmental Concern, endangered species, or municipal conservation restrictions.
- There are some naturally occurring hills which may be challenging for some bicyclists and people with disabilities.
- The Commonwealth of Massachusetts owns most of the land on which the Riverside Greenway would be constructed.
- The Charles River within the study area may be subject to the Wetlands Protection Act, the Clean Water Act and the Rivers Protection Act. Proposed Greenway alignments will avoid water and wetlands resources as much as possible, and engineers will focus on minimal impact facility types (i.e. boardwalks) in areas that encounter resources. However, early coordination with government agencies will confirm permitting requirements.
- There are no Highway Safety Improvement Program (HSIP) crash clusters in the study area (except for some locations on interstate facilities, which does not affect the Greenway). Most crashes occur on Commonwealth Avenue at the Marriott driveway, followed by the Commonwealth Avenue-Auburn Street intersection.
- The study team will meet with the City of Newton to discuss any upcoming plans for Commonwealth Avenue or the roads in the Pigeon Hill neighborhood, and with MassDOT to discuss options for the connector road.

6.1 Next Steps

- Meet with the Riverside Working Group to finalize goals and evaluation criteria
- Hold a public meeting to establish a dialogue with neighbors, stakeholders, and the general public, and listen to their concerns and ideas
- Review, refine, and evaluate alternatives



Attachments

120 Saint James Avenue
Boston, MA 02116

www.jacobs.com

Subject	Kick-off/Site Walk		
Project	Riverside Greenway Conceptual Design		
Prepared by	Beth Isler and Dieckmann Cogill		
Location	Met at Riverside Park and walked the project site	Date/Time	June 1, 2018, 10 AM to 1PM
Participants	Jacobs: Dieckmann Cogill, Beth Isler, Randy Sorensen Riverside Greenway Working Group: Ted Chapman, Larry Smith, Nathan Philips, Alicia Bowman, Tod Cochran Solomon Foundation: Herb Nolan		

Notes

- 1 D Cogill outlined the project scope and possible schedule
- 2 R Sorensen discussed the background from the 1998 Master Plan that he was involved in producing. D Cogill will distribute. The goals from this plan are largely still relevant.
- 3 Project team discussed Goals for the project. These include:
 - Connecting existing trails/closing gap
 - Getting across the highway
 - Safe network off of major streets
 - Not a single corridor. Rather, a series of interconnected segments. A regional path that serves local needs.
 - Quiet
 - Accessible
 - Foot trails along the river for hiking and recreation
 - Trail that can be used for efficient transportation
 - Recognition of many types of users, transportation, recreation, all different types of ages and abilities
 - Support the enjoyment of open space, focus on access to the river and woods. Off street, natural corridors
 - Family-oriented. A safe place for kids. The facilities shouldn't be geared for people to travel 25 mph.
 - Extend the feel of the northern Charles river paths
 - Access to the riverside MBTA station
 - Access to commuter rail station in Wellesley

Notes

- Provide a loop that families can enjoy on bikes and walking
 - Provide experiential and educational opportunities such as the existing Blue Heron paths
- 4 How many people are within a 10 -minute walk of the area for this project and for the Charles River Trail.
- 5 Working group and Jacobs walked the site and discussed constraints, opportunities and general site conditions. Note from the discussion are below. Numbers correspond to the locations on the attached map.
- 1 New bridge and Kayak Launch providing access to Riverside Park
 - 2 This section is being designed as a single track path by the AMC. There is a steep slope on one side and the Charles river on the other. It leads up the hill to the rail tunnel.
 - 3 Potential for boardwalk under the commuter rail tracks to provide access to the Charles River Park instead of the rail tunnel. There are now political questions about the viability of improving the rail tunnel.
 - 4 High parking demand during 107 Charles Street meetings
 - 5 Charles Street is very busy; many traffic concerns. Traffic is being generated by the uses out of the Stoller Boat house. There are high school students and parents. The community is concerned about this increase in use.
 - 6 Bridge to be replaced by state. Provides access to the MWRA path. When this bridge is fixed neighbors would want to consider that parking/pick up for Stoller happen on the MWRA side of the bridge.
 - 7 Area floods; potential for pause place, potential for canoe launch, the park used to be lined with boathouse and canoes.
 - 8 Charles Street under Pike is ~25' wide (E/P-E/P) with ~5'sidewalk. Murals on the walls would enhance the pedestrian comfort. Curve reduces visibility of oncoming traffic. In Pigeon Hill - Parking on Charles Street is restricted to 2 hours because of the nearby Auburndale Commuter Rail Station. Neighbors would like access to the field with removal of the chain link fence. Reduce speeds on the street. They would like to preserve on street parking.
 - 9 Old Pigeon Hill Road connects under the Mass Pike. Access is restricted to MassDOT maintenance.
 - 10 Abandoned path section (includes stairs) from Oakland Ave/Evergreen Ave down to Charles St by Nathan's house.
 - 11 Potential for one-way loop using Newland Street and Charles Street.
 - 12 Oakland could be a secondary route; make safe for walking/biking. Neighborhood greenway. The hill at Oakland/Commonwealth Ave is steep. Cyclists who aren't experienced would need to walk bikes both because of the difficulty in the ascent and the difficulty controlling the bike on the descent.
 - 13 Crossing Auburndale is challenging and should be improved through this study.
 - 14 Bourne Street (~21' wide) would be a good connection to Comm Ave.
 - 15 The DCR boathouse should be a destination with bathrooms, water, and food. Potential for a beer garden.
 - 16 (Beyond study area) Potential for a boardwalk between Marriott and river, eventually

Notes

connecting to DCR boathouse.

17 MWRA driveway can be reconfigured to provide protected bike and ped access to the MWRA path. Project should propose intersection improvements to provide safe access from Riverside Park.

18 Provide protected bike and pedestrian facilities over the bridge to the two bridges, Riverside station, and future TOD development.

19 Commonwealth Ave Comments:

Reconfigure to maintain carriage road throughout study area (use Cedar/Morton and Comm Ave and City Hall for other examples)

Consider other configurations that would provide a protected multiuse path throughout the study area. Two-way bike facility, reducing lane widths, reducing travel lanes, removing parking, adding parking (for new dog park).

CONTINUITY is most important. Would like to see this be an extension of Lyons Field/Norumbega Park. Also, consistency of facility types. Think of Carriage Roads as parkland.

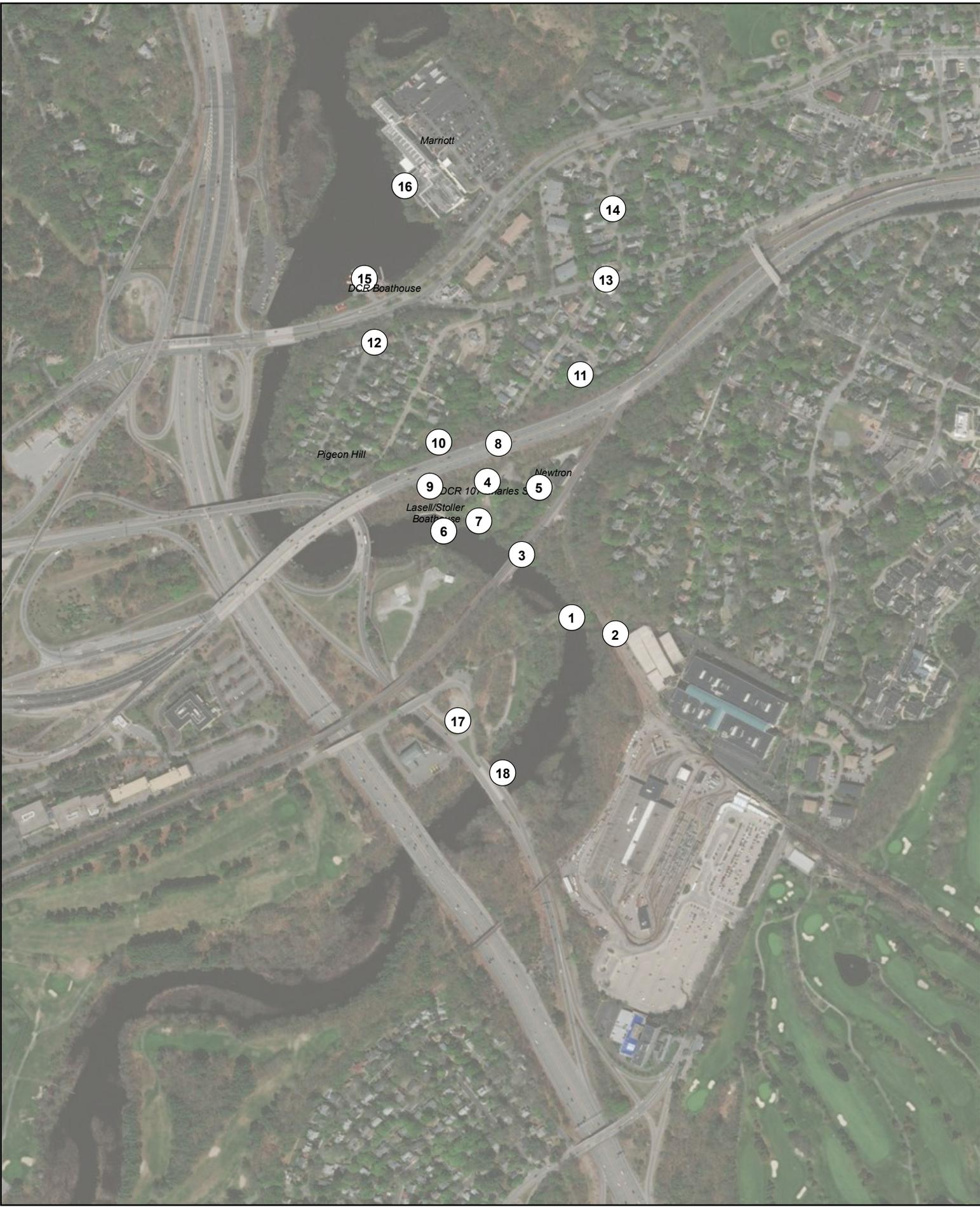
6 Other general comments –

Potential to have the path follow the river similarly to the Ladybird Johnson path.

General sense that the neighborhood streets in Pigeon Hill Neighborhood don't need any expensive engineering treatment. They are already low speed and low volume. There is a need to provide legibility and wayfinding so that it feels like a trail connection and part of the trail system.

7 Next Steps

- Get goals out for discussion in meetings
- Tunnel assessment by September (?)
- Develop a matrix to show the trade-offs of alternatives
- Connect with Nicole Freedman on Comm Ave



Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



120 Saint James Avenue
Boston, MA 02116

www.jacobs.com

Subject	Riverside Community Walk		
Project	Riverside Greenway Conceptual Design		
Prepared by	Beth Isler and Dieckmann Cogill		
Location	Met at Riverside Park and walked the project site	Date/Time	June 7, 2018, 10 AM to 1PM
Participants	Riverside Greenway Working Group: Ted Chapman, Larry Smith, Nathan Philips, Alicia Bowman, Tod Cochran Solomon Foundation: Herb Nolan		

Notes (compiled from emails sent from the working group)

- 1 From Herb - - The split in the traffic pattern on Commonwealth happened at the time the Marriott hotel and I-90 turnpike were built.

 - Can the trail follow the river itself and skirt under the Rt 30 bridge and along the shore?
 - Make the trail as park-like as possible.
 - The trail in Lyon's Park is woefully deficient. The DCR needs to broaden and pave it
 - Once complete will this path be crowded with cyclists who are avoiding the Rt 30 corridor?
 - What can be done to slow cyclists down on local streets?
- 2 From Nathan - On the corner of Charles St. and Auburn St. are our good friends Lise and John, who live in that yellow two story stone house right on the south corner of Charles/Auburn, and Nora and Dan, who live just across the street on the North side of Auburn. Lise is from Denmark and knows and appreciates world-class bike infrastructure and walkability. Both couples have young kids and have big concerns about the speeding cars and the unsafe intersection. Lise has some specific opinions about ped crossings and sight lines. The school bus stop is at Bourne & Auburn and this fact plays into her thoughts. I'd love if the Jacobs team could reach out for a chat with them. If you are able I'll make e-intros.

Also, by chance, my partner Robyn (who I think folks met briefly on the kickoff walk) and I met two residents of Oakland Ave who couldn't make our recent walk but were enthusiastic about the concept. Crucially, one of them, Sandy Hurwitz, owns the home on the top "elbow" between Oakland and Evergreen, and her property drops down to the river with a small pier/dock. That dock was the one thing that gave me pause in thinking about whether a route could be built along the river and under or up to the Rt 30 bridge, as an alternative to Pigeon Hill Road/Oakland Ave. I was pleasantly surprised to find that Sandy unhesitatingly said she would welcome a public route along the riverbank below her home. It's refreshing to meet a fellow YIMBY!

On our thursday evening walk, at least two other residents asked whether there could be a route that goes upstream from the Lasell Boat house and wraps under the Rt 30 Bridge to connect to the Canoe/Kayak Rental and Marriott. Is it possible for the Jacobs team to scope such a route out?

Notes (compiled from emails sent from the working group)

Could you also meet with Sandy Hurwitz - either way she's an abutter and could be a huge ally especially if brought into the conversation early.

3 From Herb - Good morning folks. A quick thought about the feasibility of a shore path skirting the edge of Pigeon Hill. Its an provocative idea that certainly needs to be looked at in order to answer the question. Having walked it with members of the working group last November I am extremely skeptical that it is feasible given the steep cross slopes or even desirable. If the choice is between a short quiet neighborhood street and a reclaimed Pigeon Hill path vs 2000' of retaining walls or perched boardwalk passing under four highway bridges (think safety & maintenance) the answer seems pretty clear. The noise from 128 is pretty tough down there. Still well worth a look but lets not raise hopes too high.

I think we have one public meeting in the Jacobs scope this spring/summer for presenting analysis, early route options, and listening to feedback. We should pick the best space and lock it in. May want to look ahead to fall and lock in a venue for the presentation of alternatives.

We really needed that over all regional map showing how these different efforts and paths link up. We needed it for our site walk with the neighbors last week. I have one in the works and will share soon for feedback.

4 From Tod - Hi all, I heard some random comments from long term Auburndale residents on Thursday night which support the need for Herb's overall regional map:

* Wait, where is Riverside from here?

* Oh yeah, I know about the two bridges. The ones over the Charles river, right?

* I really think you guys need to have a BIG map so we can figure out how this thing works.

Along these lines, I would love it if we had a 6 foot by 6 foot map so that the members in the back of a 40 person audience can follow the speaker in the front of the room. A projector and screen can work, but audience members cannot wander up before and after the meeting to study it.

5 From Ted - Two options, in the river or on the bank, totaling 2000 ft.

Herb, for purposes of study/estimate we should add a spur under trail bridge from the Pony Truss Trail to the Lasalle Boat House

I heard the same requests on the walk; and share the feeling that being close to the River is the ideal, but ...

Maybe we could get Christo interested in an installation;

<https://www.boredpanda.com/floating-piers-open-christo-jeanne-claude-italy/>

Seriously, I spoke with Chris Girard at Dock Doctors in Ferrisburgh, Vt. They have done some projects with Paddle Boston. <https://thedockdoctors.com/floating-walkways.html>

In the River

I sent him some information and we is going to share the costs of some recent projects they have done.

Each project so unique, and custom that any estimates are ruff; the walkways have to be anchored in some way to the river bottom or shore.

Notes (compiled from emails sent from the working group)

On the shoreline

Amy Sangiolo got an estimate in 2009 (so current costs might need to be upped by 1.5-2x) for 3 options for the building trails along the Charles in the DCR land abutting the golf course and Recreation Rd. These involved cut and fill, and variable amounts of retaining walls. Those estimates are attached.

Any work along the river whether floating or on the shore brings up huge issues and costs for environmental and conservations issues with the state and city.

All of which adds significantly to costs. You can see the effect on the attached budgets for flood plain remediation.

I agree with Herb's perspective, that while appealing the costs of shoreline in the river alternatives for an accessible path are going to be prohibitive. But we owe it to the public to say that we have looked at these, not tossed them without consideration.

Maybe Dieckman and Beth could give us the current linear foot costs for the option.

-
- 6 From Nathan - I just took another walk along the river from Lasell boat house to Comm Ave. There is a "hi-line" option that departs from Pigeon Hill Rd at the top (toward the far end of the wood fence below, just before the detached shed at 69 Oakland Ave), stays up high and close to the property lines behind the houses on Oakland, and descends gradually to Comm Ave near its intersection with Auburn St. This route would not go underneath the Rt 30 bridge but would cross at Comm x Auburn.
- There is another somewhat gradually descending route that would split off from this same hi-line route that could go to a wraparound deck under Rt 30.
- Both/either of these routes might be more AMC style trails, because there are still some slope issues. It would be great to get access to a fine scale digital elevation map to be able to assess slopes and grades better. I wonder which state agency would have the best one?
- Whether any of this is preferable to simply using Oakland Ave, I don't know! Nathan

-
- 7 From Larry - I just looked at the city assessing maps and all of the land along the river behind Oakland Avenue from Commonwealth Ave to the Mass Pike is owned by the State. It appears that the State land extends about 100' back from the river.
- Perhaps a trail under Route 30 and then tying into the old Pigeon Hill Road we walked is a possibility.

120 St. James Avenue, 5th Floor
Boston, Massachusetts 02116

www.jacobs.com

Subject Summary - Riverside Greenway Public Meeting #1

Attention Riverside Greenway Working Group

From Dieckmann Cogill, Beth Isler

Date September 24, 2018

Copies to

On September 17, 2018, the Riverside Greenway Working Group held a public meeting to solicit input from the community on the Riverside Greenway project. The meeting was held at the Auburndale Community Library. The evening kicked off with introductions and a slide presentation (attached) followed by smaller group discussions in which attendees could visit large format maps and boards to talk about each of the five sub-study areas and the project Vision and Goals. Attendees were invited to write comments, ideas, and concerns on post-it notes and attach them to the boards.

The discussions focused on four main points:

1. Connections and access throughout the study area, particularly to the Charles River and to the MBTA Riverside T station
2. Crossing Commonwealth Avenue safely
3. Making use of Commonwealth Avenue's Carriage Lanes for people walking, running, biking, etc.
4. Calming traffic to improve safety for all users

The table below organizes the comments into these four categories as applicable. There was support for the preliminary draft greenway alignments, as well as suggestions for new alignments. The study area map has been updated to show these new alignments, and is provided after the table.

Connections and access
<ul style="list-style-type: none">• Restore the walking loop through Riverside Park using the Pony Truss and Charles St bridges and RR underpass• Add sidewalks [Commonwealth Avenue]• Charles Street and tunnel could give Pigeon Hill area good access to Riverside• Why not have a path along the river? Yes!• Plans to renovate/utilize Norumbega Park? More than just a dog park?• Trail signage from commuter rail station• Social issue of people who work and live in apartments to get to public transportation access to Riverside? Marriott employees?

- Identify precise segments that can be constructed in phases as opportunities present themselves
- Marriott employees use Riverside station and walk to Marriott to get to work
- Historical markers for Norumbega Park? [was this referring to the need for them? Or the preservation of existing?]
- Instead of Comm Ave, why not connect through Norumbega?
- Boardwalk under [MassPike] bridge/over river to bank on the other side
- Renovate old walking path
- I want a trail running between the houses (on Oakland Ave) and the river
- Signage/connection to Weston Aqueduct trail [west of Route 95/128]
- Park [east of Charles St and immediately north of Pike]
- Parking concerns on Charles St
- Get buy-in from MassDOT to get under I-90 early and often for Pigeon Hill Road connection
- Seek connections along river rather than up on Pigeon Hill Road
- Evergreen and Oakland are too steep for some cyclists or for ADA compatibility
- There needs to be better access to the river
- Stroller access
- Triangle between Pike and Commuter Rail is a lost area now. Needs access.
- Walking path from Pigeon Hill and Charles Street to Riverside would be great (through Depot Tunnel)
- Clarify a phased project to account for current opportunities and future opportunities
- I'd like to see SAFE walking trails for Lower Falls to Riverside-Williams School- and access to river by boathouse
- Walking access between Pigeon Hill and Riverside is key!
- Consider utilizing land at rear of Riverside "yard" for at grade path or gradual descent path to Pony Truss Trail grade (ask Jennifer Steel)
- Connect Pony Truss Trail to office park at Riverside Center and Riverside Station to avoid ½ mile walk around Riverside
- Northern access to Riverside station?!
- Connect neighborhoods east of Pony Truss (between Riverside MBTA and commuter rail line) to trail network and Riverside MBTA
- We love walking to this bridge but the trails/access need improvement

Crossing Commonwealth Avenue safely

- Crosswalks on Commonwealth
- Both Comm Ave crossings have good sight lines for signalization. The Oakland one already has eastbound signals, but no crosswalk or walk cycle

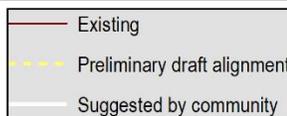
- Don't have people cross at the dangerous intersection by the Marriott/boathouse/gas station. It's dangerous for cars. Adding pedestrians to this would be a nightmare
- Slower, more crossings
- Lights for crossing
- Raise road at crossing
- Crossing Comm Ave to get to Norumbega area is SO dangerous. Our neighbor was hit by a car here.

Commonwealth Avenue's Carriage Lanes

- Continue Carriage Lane from Islington to the river to:
 - Improve safety at Auburn, Bourne for cars and pedestrians
 - Provide improved access to dog park to be and Norumbega Conservation area and Lyons Park
- Restoration of Carriage Road on Comm Ave would make it a lot easier for users of Norumbega Park and new dog park adjacent to Comm Ave and make parking design much easier. It would provide easier crossing access to park users from south side of Comm Ave

Calming traffic to improve safety for all users

- Fix Commonwealth-Auburn intersection so drivers from Auburn St don't have to merge with fast through traffic to reach 128 north
- Better intersection by Marriott/boathouse; dangerous
- Auburn Street is fast-moving and needs traffic calming.



Service Layer Credits: Esri, HERE, Garmin, © OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS,



The following sections summarize all of the input received in each of the smaller discussion groups.

1. Vision and Goals

Riverside Greenway Conceptual Plan	
Study Area	Vision & Goals
	<p>Vision: Link communities and bring people together to share in a common natural resource.</p> <p>Goals</p> <ul style="list-style-type: none"> • Improve access to the river and/or greenway for people walking, biking, or taking part in other activities. • Improve circulation and open-space connections along the river corridor. • Protect and enhance the character of open space and the shoreline along the River. • Protect and improve visual/scenic quality. • Limit potential conflicts between activities. <hr/> <p>What are your thoughts about the draft goals? How would you change them? Write your comment on a sticky note and post below.</p> <hr/> <p><i>creating connections / restoring a legacy</i></p>

- Restore the walking loop through Riverside Park using the Pony Truss and Charles St bridges and RR underpass

2. Commonwealth Avenue

Riverside Greenway Conceptual Plan

Commonwealth Avenue

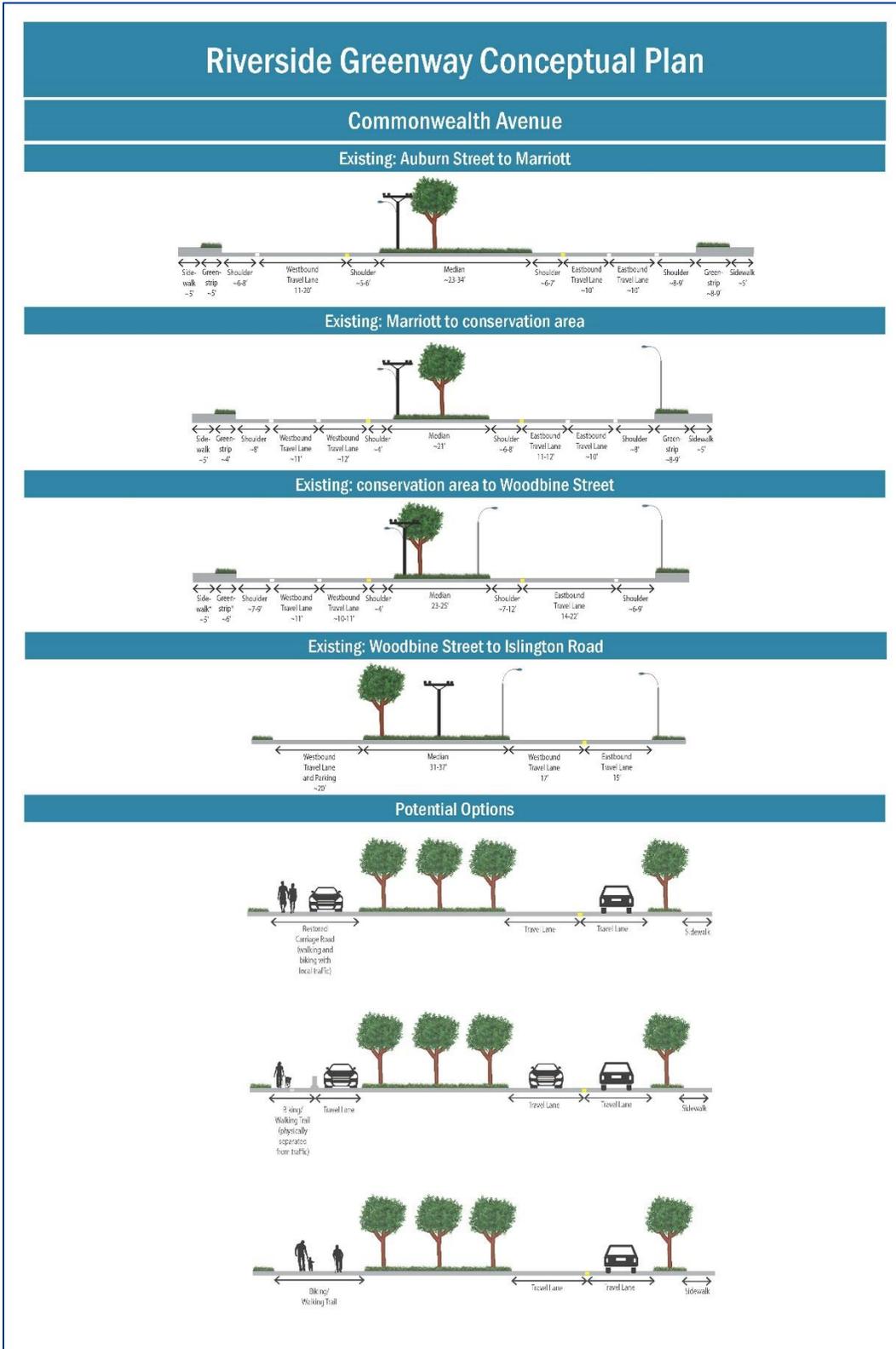
Commonwealth Avenue

	Existing
	Potential alignment
	Potential crossing location

0 125 250 375 500 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar, IGN, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

What do you think of this area?
What would you like to see done here?
Write your comment on a sticky note and post it below.



- Fix Commonwealth-Auburn intersection so drivers from Auburn St don't have to merge with fast through traffic to reach 128 north
- Crosswalks on Commonwealth
- Both Comm Ave crossings have good sight lines for signalization. The Oakland one already has eastbound signals, but no crosswalk or walk cycle
- Don't have people cross at the dangerous intersection by the Marriott/boathouse/gas station. It's dangerous for cars. Adding pedestrians to this would be a nightmare
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- Better intersection by Marriott/boathouse; dangerous
- Charles Street and tunnel could give Pigeon Hill area good access to Riverside
- Slower, more crossings
- Why not have a path along the river? Yes!
- Lights for crossing
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- Restoration of Carriage Road on Comm Ave would make it a lot easier for users of Norumbega Park and new dog park adjacent to Comm Ave and make parking design much easier. It would provide easier crossing access to park users from south side of Comm Ave
- Plans to renovate/utilize Norumbega Park? More than just a dog park?
- Trail signage from commuter rail station
- Social issue of people who work and live in apartments to get to public transportation access to Riverside? Marriott employees?
- Identify precise segments that can be constructed in phases as opportunities present themselves
- Marriott employees use Riverside station and walk to Marriott to get to work
- Historical markers for Norumbega Park?
- Instead of Comm Ave, why not connect through Norumbega?

3. Pigeon Hill

Riverside Greenway Conceptual Plan

Pigeon Hill

Pigeon Hill

— Existing ● Potential crossing location
- - - Potential alignment

0 125 250 375 500 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and

What do you think of this area?
What would you like to see done here?
 Write your comment on a sticky note and post it below.

- Crossing Comm Ave to get to Norumbega area is SO dangerous. Our neighbor was hit by a car here.
- Auburn Street is fast-moving and needs traffic calming.
- Boardwalk under [MassPike] bridge/over river to bank on the other side
- Renovate old walking path

Summary - Riverside Greenway Public Meeting #1
September 24, 2018

- I want a trail running between the houses (on Oakland Ave) and the river
- Signage/connection to Weston Aqueduct trail
- Park [east of Charles St and immediately north of Pike]
- Parking concerns on Charles St
- Get buy-in from MassDOT to get under I-90 early and often for Pigeon Hill Road connection
- Seek connections along river rather than up on Pigeon Hill Road
- Evergreen and Oakland are too steep for some cyclists or for ADA compatibility

4. MassPike to Commuter Rail

Riverside Greenway Conceptual Plan

MassPike to Commuter Rail Line

MassPike to Commuter Rail

Existing
 Potential alignment

0 75 150 225 300 Feet

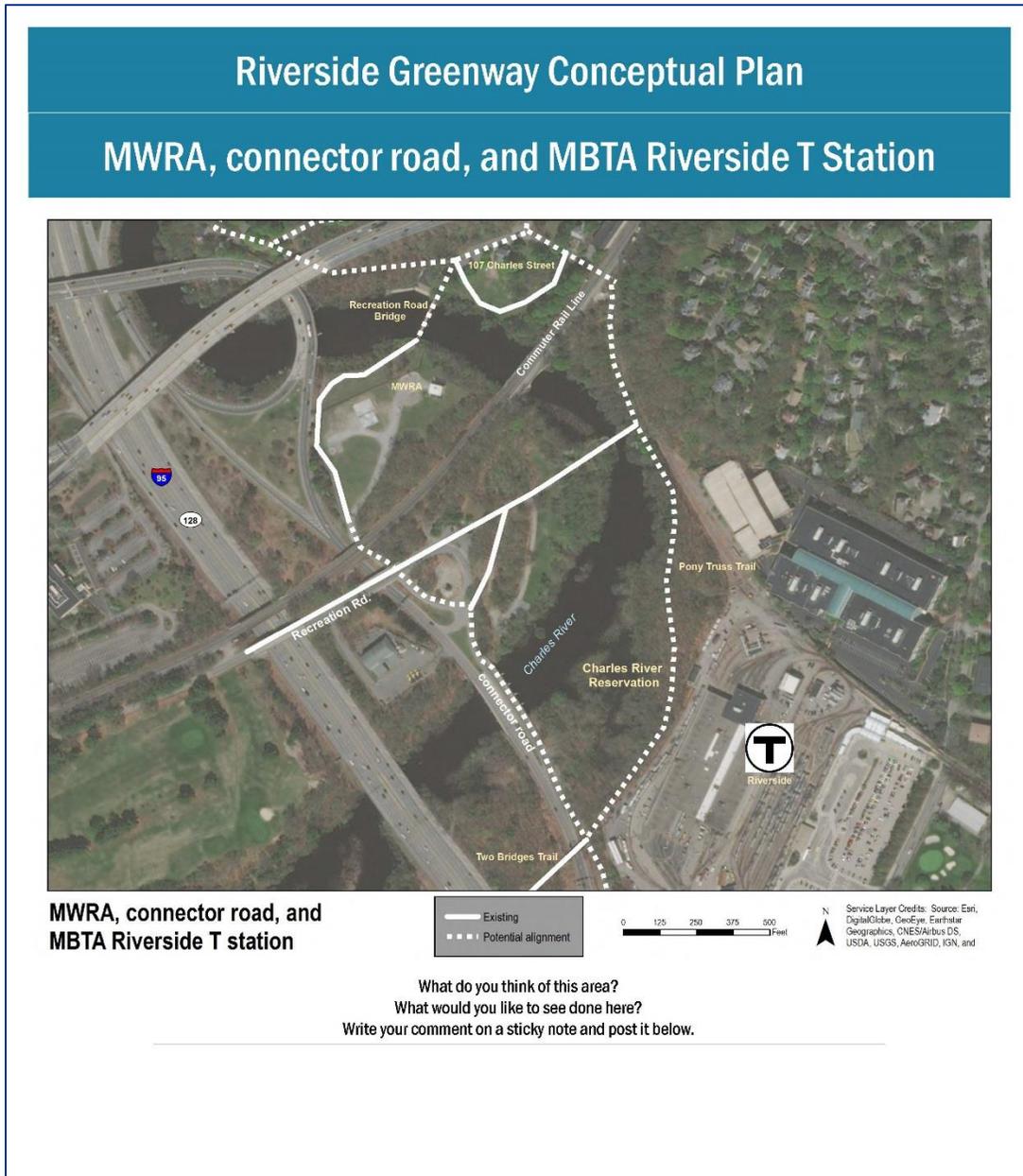
Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNR/S/Airbus DS, USDA, USGS, AeroGRID, IGN, and

What do you think of this area?
What would you like to see done here?
 Write your comment on a sticky note and post it below.

- There needs to be better access to the river.
- Stroller access
- Parking concerns on Charles Street
- Triangle between Pike and Commuter Rail is a lost area now. Needs access.

- Walking path from Pigeon Hill and Charles Street to Riverside would be great (through Depot Tunnel)

5. MWRA, connector road...



- Clarify a phased project to account for current opportunities and future opportunities
- I'd like to see SAFE walking trails for Lower Falls to Riverside-Williams School- and access to river by boathouse

Summary - Riverside Greenway Public Meeting #1
September 24, 2018

- Walking access between Pigeon Hill and Riverside is key!
- Consider utilizing land at rear of Riverside “yard” for at grade path or gradual descent path to Pony Truss Trail grade (ask Jennifer Steel)
- Connect Pony Truss Trail to office park at Riverside Center and Riverside Station to avoid ½ mile walk around Riverside
- Northern access to Riverside station?!
- Connect neighborhoods east of Pony Truss (between Riverside MBTA and commuter rail line) to trail network and Riverside MBTA

6. What else do you want us to know?

Riverside Greenway Conceptual Plan	
Next Steps for Conceptual Design	What else do you want us to know?
<ul style="list-style-type: none">• Finalize goals and evaluation criteria• Develop draft alternatives• Review, refine, and evaluate alternatives	<p>Do you currently visit the area? How do you get there? Where do you go? What do you love about it? What is missing? Write your thoughts on a sticky note and post below.</p> <div style="border: 1px solid black; height: 200px; width: 100%;"></div>
	<p><small>creating connections / restoring a legacy</small></p>

- We love walking to this bridge but the trails/access need improvement



**Riverside Tunnel
Tunnel Condition Assessment
Newton, Massachusetts**

Jacobs Project No.: E2X81200

Submitted to Solomon Foundation:

**Draft Report on October 22, 2018
Final Report on December 19, 2018**

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APPENDIX D: PROPOSED RAMP SKETCHES (OPTION 2)

Executive Summary:

Jacobs was retained by the Solomon Foundation to perform a condition assessment at the Riverside Depot tunnel as part of a larger project assessing the Riverside Greenway. The goal of the project is to reestablish the connection between the Riverside Depot tunnel and nearby trails. The Riverside Depot tunnel carries active MBTA tracks over a pedestrian tunnel at the end of Charles Street in Newton, MA (located in the village of Auburndale). The tunnel is currently closed but was previously used by pedestrians and commuters utilizing Riverside Station and the nearby Riverside Greenway trails.

Jacobs field investigation occurred on July 11th, 2018 and found that the tunnel is in similar condition to previous inspection reports. The following deficiencies were noted:

- The tunnel floor exhibits spalling, cracking, and delaminations with an accumulation of debris throughout.
- There is no drainage system within the tunnel.
- The stairs at the South entrance exhibit vegetation and tree growth between cracks in the treads and misalignment of the treads.
- The walls are missing areas of brick in the first and second layer and exhibit areas of missing pointing. The bricks are also typically covered with graffiti.
- The concrete encased beams exhibit spalling, cracking, and efflorescence.
- The ceiling panels and framing exhibit spalling with exposed reinforcement and heavy rust and pitting losses to steel members. Several panels are missing.
- Light fixtures throughout are broken or missing conduit.
- The height of the tunnel opening varies, but in general falls short of the current standard of 8'-0" minimum vertical clearance to obstruction per the FHWA.
- The tunnel as currently constructed does not meet ADA requirements due to the configuration of the South entrance, which has only stairs for access.

Two repair options have been developed as a result of the tunnel assessment. The major items for each option are shown below, as well as the order of magnitude cost:

Item	Option 1 – Restorative Option	Option 2 – Improvement Option
Stairs	Replace misaligned treads, remove vegetation.	Remove stairs and replace with ADA compliant ramp.
Floors	Remove debris and perform spot repairs of spalls and cracks.	Remove debris and replace floor slab, install drainage system.
Walls*	Repoint granite and replace missing or broken bricks.	Repoint granite and replace bricks throughout.
Ceiling Panels**	Remove debris and repair damaged or missing panels.	Remove debris and replace ceiling panels.
MBTA Beams***	Clean and repaint exposed portions of beams.	Clean and repaint exposed portions of beams, repair encasements.
Lighting	Replace broken lighting.	Replace broken lighting.
Exterior	Remove vegetation growth and replace utility junction box.	Remove vegetation growth and replace utility junction box.
Overall cost	\$480,00.00	\$710,000.00

*The cost for this item may be reduced by reusing some of the existing bricks. The Contractor would need to determine whether that option is feasible or not.

**Replacement/Repair of Ceiling Panels may also be optional. To be discussed with clients. The cost for replacement of the ceiling panels is estimated at \$45,000. As an alternative, the ceiling panels could be removed and a fence be installed along the top of the walls and stairs/ramp. The cost of the fencing and ceiling can be considered similar and will not change the overall price for either option. A better recommendation can be made during the design phase, when calculations can confirm whether the existing walls need any retrofit to install posts for the proposed fencing.

***Cleaning and painting the MBTA Beams is an optional repair and the cost is estimated at \$47,250.

Jacobs recommends that the Solomon Foundation pursue funding for the Improvement Option (Option 2), as Option 1 would not meet current ADA standards and will provide a much shorter design life when compared to Option 2. Option 2 is more expensive, but will provide an ADA compliant passageway that can be used by all pedestrians, as well as a longer design life, reducing future costs for the MBTA and other state agencies.

Introduction:

Jacobs was retained by the Solomon Foundation to perform a tunnel condition assessment at the Riverside Depot tunnel which carries two Framingham Line Commuter Rail and CSX tracks over the pedestrian way at Charles Street in Newton, Massachusetts (in the village of Auburndale). The tunnel is designated as Bridge No. N-12-057 (74A) by MassDOT and the MBTA. The tunnel condition assessment is part of a greater assessment of the Riverside Greenway, with the overall goal of the project to develop a concept to link surrounding trails. The Riverside Depot tunnel is a main link and would provide access for people to safely cross the track and access all areas without any obstruction.

Jacobs field investigation occurred on July 11th, 2018. Weather conditions were fair; sunny and a high of 78°F. The floors, walls, and ceiling of the tunnel were inspected on foot.

Description of The Riverside Depot tunnel:

Figure 1: View from inside the tunnel.

The Riverside Depot tunnel is a pedestrian way built in the late 19th century as a part of the Riverside Depot, which brought passengers to the Riverside Recreation Area on the Charles River. The west end of the tunnel is at grade with Charles Street, with the tunnel passing beneath the MBTA tracks and bending south. The south entrance is not at grade and is accessed by granite stairs. The floor of the tunnel consists of a concrete slab. The walls/abutments consist of granite blocks with a two brick layer brick veneer. The roof of

the tunnel (below the tracks) consists of thirty-two (32) concrete encased steel beams. There is also a separate “ceiling” to the east of the tracks that consists of steel beams with skylight panels. There is no drainage system in the existing tunnel.

The pedestrian way was closed in 2014 following a bridge inspection by the MBTA and has not been reopened. The closure was due to noted safety concerns in the tunnel such as loose bricks, exposed wiring of the lighting system, debris, etc. and not due to the structural integrity of the concrete encased steel beams which carry the MBTA tracks over the pedestrian tunnel. Inspectors during the 2014 inspection found that the tunnel required maintenance and cleaning before being reopened, including repairing the exposed wiring, removal of all debris, and stabilization or removal of the failing brick walls/facades along both abutments. Warning signs were posted notifying pedestrians that the tunnel is closed and steel fencing with a steel mesh was placed at each

Tunnel Condition Assessment

The Riverside Depot Tunnel
Final Report Submittal

December 19, 2018

entrance. Currently, pedestrians who attempt to cross the MBTA tracks defy the posted warnings and climb across the tracks to reach the trails southeast of the tunnel.

Objectives:

The Solomon Foundation is investigating the feasibility of reopening the presently closed tunnel to connect the trails of the Charles River Corridor and local roads. The purpose of this condition survey and assessment was to determine the state of the tunnel and provide a scope and cost estimate for the repair of the tunnel, excluding the concrete encased steel beams that carry the MBTA tracks. The concrete encased steel beams have previously been inspected and analyzed for capacity and were found to meet statutory requirements for all current design loadings. This condition assessment is intended to provide guidance for further design development by state agencies with two repair options for the tunnel. Option 1 is to develop a strategy to restore the tunnel to its original state, repairing the current level of access and restoring the tunnel for safe passage (deemed as the Restorative option). Option 2 is considered an improvement of the existing tunnel, replacing the stairs with a ramp that meets ADA requirements, as well as other improvements such as installing a drainage system and replacing missing or broken bricks and ceiling panels (deemed as the Improvement option). Note that it is assumed that Option 1 would require a waiver from the MBTA or other state agencies due to the existing tunnel not meeting current ADA requirements and its feasibility is unclear at this time.

The following tasks occurred to meet the objectives of this report:

- Review of prior inspection reports of the structure, which is designated Bridge No. N-12-057 (74A) by MassDOT and the MBTA.
- Review of prior rating reports of the structure.
- Hands on assessment of the current condition of the floor, stairs, walls, and alcove “ceiling”.
- Assess drainage system.
- Assess the lighting system and the power source.
- Develop scope and cost estimate for repair options 1 and 2.

Visual Observations and Repair Recommendations:

On July 11th, 2018, a hands on inspection was performed to identify the general condition of the tunnel including the floor, walls, ceiling, and exterior/access areas of the tunnel. The tunnel elements exhibit spalls, delaminations, cracking, debris throughout, areas of missing brick (within both the first and second layer), rust and efflorescence along underside of the load carrying beams, and missing and rusted lighting conduit. Masonry hammers were used to determine the extent of any loose brick and spalled and delaminated concrete.

While notes are included below regarding the condition of the concrete encased steel beams, these beams were not evaluated for their structural capacity as part of this assessment as they have been previously analyzed as part of a rating report in 2012.

A summary of Jacobs' observations is as follows, **see Appendix A for Inspection Photos and Appendix B for Inspection Sketches:**

Floor Deficiencies:

1. The floor slab exhibits moderate to severe spalling, delaminations, and cracking (**see Photo 1**). Typical throughout pedestrian way, the floor slab exhibits areas of debris collecting along walls.
2. Near the bottom of the south stairs, there is a 4'-6" long x 4'-0" wide x 3" deep spall that is heaving (**see Photo 2**).
3. There are cracks in the floor slab up to 3/8" wide.
4. There is a patch approximately 4'-0" long x 4'-0" wide with areas of delamination and spalling adjacent (**see Photo 3**).
5. There is no drainage system along the tunnel floor, although the floors are sloped to mitigate pooling water along the walkway.

Wall Deficiencies:

1. The walls are typically covered in graffiti (**see Photo 4**).
2. Near the temporary fence at the west entrance, there is a 1'-1" wide x 1'-8" high area of missing bricks on the first layer. Adjacent to this is a 1'-7" wide x 5'-0" high area of missing bricks to the first layer and heavy deterioration and missing mortar to the second layer (**see Photo 5**).
3. On the south wall under Beam 15, there is a 1'-4" wide x 8" high area of missing brick on the first layer of brick.
4. On the north wall under Beam 10 through Beam 20 a 17'-0" long x 3'-4" high area of missing brick on first layer and 2'-3" wide x 1'-5" high area of missing bricks on

- the second layer (**see Photo 6**). The remaining bricks in this area and to the temporary fence are bowed out, creating an up to 4" gap (**see Photo 7**).
5. On the south wall at east corner, an up to 5'-0" wide x 8'-1" high area of missing bricks on the first layer and 3'-6" wide x 2'-10" high area of missing bricks to the second layer (**see Photo 8**).
 6. On the west wall near the north corner is a 1'-2" wide x 4'-8" high area of missing bricks to the first layer.
 7. The east wall first layer of bricks is missing 25% of its mortar.

Ceiling Deficiencies:

1. Moving from the West Entrance to the South Entrance, the clearance measurements are as follows, 7'-9" at Stringer 1, 7'-5" at String 32, 9'-9" at the bend, 7'-9" at bottom step. Note that current FHWA standards require 8'-0" minimum clearance.
2. Section of conduit missing along the top of the north wall. 100% section loss to the conduit along top of north wall (**see Photo 9**).
3. Heavy rust to the Fascia Member, channel section, at Beam 32 (**see Photo 10**).
4. Ceiling panels missing in several areas where the alcove ceiling abuts the tunnel structure (**see Photo 11**).
5. Some of the concrete ceiling panels exhibit spalling to various extents with exposed reinforcement (**see Photo 12**).
6. Full depth spall in the southern bay above the stairs (**see Photo 13**).
7. There are several broken light fixtures (**see Photo 14**).
8. Junction box on west wall near stairs exhibits heavy rust and exposed wires.
9. Minor load vibrations during train load.

MBTA Beams:

1. The bottom of Beam 5 exhibits heavy rust to the bottom flange up to 3/8" Deep pitting loss (**see Photo 15**). Similar at Beams 11, 18, 19, 25, 26, and 32.
2. The encasement between Beams 11 and 12 exhibit cracking, efflorescence and honeycombing (**see Photo 16**). Similar between Beams 25 and 26, and Beams 26 and 27.

Exterior Deficiencies:

1. Utility junction box at the west entrance is missing door (**see Photo 17**).

2. Southwest and northwest Wingwalls and embankment exhibit heavy vegetation **(see Photo 18)**.
3. Retaining wall at northwest corner is undermined 6'-0" long x full width at base **(see Photo 19)**.
4. West headwall exhibits cracking and efflorescence.
5. Railing is broken around all three sides of stairs **(see Photo 20)**.
6. The stairs are misaligned throughout and there appears to be missing fill below the granite. Tree stumps remain between treads of stairs where previous vegetation has been removed **(see Photo 20)**.
7. Skylight area is covered in debris **(see Photo 21)**.
8. West and south entrances are temporarily closed with the steel mesh fencing restricting access **(see Photo 22)**.

Repair Recommendations:

Two repair options are proposed:

Option 1: Restorative Option:

This option includes restoring the current level of service/access to the tunnel and repairing items which are currently unsafe or have failed. Jacobs recommends:

- Remove all areas of spalled and delaminated concrete at the floor slabs and patch.
- Clear the floor of all debris.
- Chip down or patch any areas of heaving or settlement.
- Larger cracks (greater than 1/16" wide) should be sealed.
- Remove and replace all existing layers of bricks located in front of the walls/abutments. Existing bricks may be reused to reduce costs. When walls/abutments are exposed, repoint any missing or deteriorated mortar.
- Clear all debris on the skylight panels. The panels should be removed and replaced or an alternative should be utilized.
- Remove and replace broken conduit and light fixtures.
- Granite stairs at south entrance should be removed and replaced, either by reusing the existing granite or with new granite steps.

Note that replacement of the ceiling members over the south entrance to the tunnel is optional, and it would be expected that an alternative solution is possible. One option may be to not replace the ceiling area and install additional fencing around the opening.

For the exterior areas, the retaining walls should be repaired or replaced as necessary. The broken railings at the stairs should be removed and replaced. The utility junction box should have a new door installed.

Option 2: Improvement Option:

This option includes removal and replacement of all elements of the tunnel which have failed or exhibit deterioration. In addition, a drainage system would be added and an ADA compliant ramp be installed in place of the stairs. Jacobs recommends:

- Clear the floor of all debris, replace floor slab, and install a drainage system.
- Chip down or patch any areas of heaving or settlement.
- Larger cracks (greater than 1/16" wide) should be sealed.
- Remove and replace all existing layers of bricks located in front of the walls/abutments. Existing bricks may be reused to reduce costs. When walls/abutments are exposed, repoint any missing or deteriorated mortar.
- Clear all debris on the skylight panels. The panels should be removed and replaced or an alternative should be utilized.
- Remove and replace broken conduit and light fixtures.
- Granite stairs at south entrance should be removed and replaced with an ADA compliant ramp.
- Clean and repaint exposed portion of beams, repair to damaged encasements should be made as well.

Note that replacement of the ceiling members over the south entrance to the tunnel is optional, and it would be expected that an alternative solution is possible. One option may be to not replace the ceiling area and install additional fencing around the opening.

For the exterior areas, the retaining walls should be repaired or replaced as necessary. The broken railings at the stairs should be removed and replaced. The utility junction box should have a new door installed and the vegetation removed.

See Appendix D for sketches of proposed ramp layout.

Overall Recommendation:

Jacobs recommends that the Solomon Foundation pursue funding for the Improvement Option (Option 2), as Option 1 would not meet current standards and will provide a much shorter design life when compared to Option 2. Option 2 is more expensive, but will provide an ADA compliant passageway that can be used by all pedestrians, as well as a longer design life, reducing future costs for the MBTA and other state agencies.

Item	Option 1 – Restorative Option	Option 2 – Improvement Option
Stairs	Replace misaligned treads, remove vegetation.	Remove stairs and replace with ADA compliant ramp.
Floors	Remove debris and perform spot repairs of spalls and cracks.	Remove debris and replace floor slab, install drainage system.
Walls*	Repoint granite and replace missing or broken bricks.	Repoint granite and replace bricks throughout.
Ceiling Panels**	Remove debris and repair damaged or missing panels.	Remove debris and replace ceiling panels.
MBTA Beams***	Clean and repaint exposed portions of beams.	Clean and repaint exposed portions of beams, repair encasements.
Lighting	Replace broken lighting.	Replace broken lighting.
Exterior	Remove vegetation growth and replace utility junction box.	Remove vegetation growth and replace utility junction box.
Overall cost	\$480,00.00	\$710,000.00

Appendix A: Inspection Photos



Photo No. 1 – Typical spalling, delamination and cracking to floor slab.



Photo No. 2 – Near south entrance stairs - 4'-6" long x 4'-0" wide x 3" deep spall with heaving.



Photo No. 3 –Southeast corner - 4'-0" long x 4'-0" wide patch with adjacent areas of spalling and delamination.



Photo No. 4 – Typical area covered in graffiti, shown on west wall.



Photo No. 5 – South wall, west entrance – 5’-0” wide x 1’-7” high area missing brick in first layer and heavy deterioration and missing mortar in second layer.



Photo No. 6 – North wall, below Beams 10 through 20 – 17’-0” long x 3’-4” high area of missing brick in first layer and 2’-3” long x 1’-5” high area of missing brick in second layer.



Photo No. 7 – North wall, at area of missing brick – remaining brick layer bowed out with up to a 4” gap.

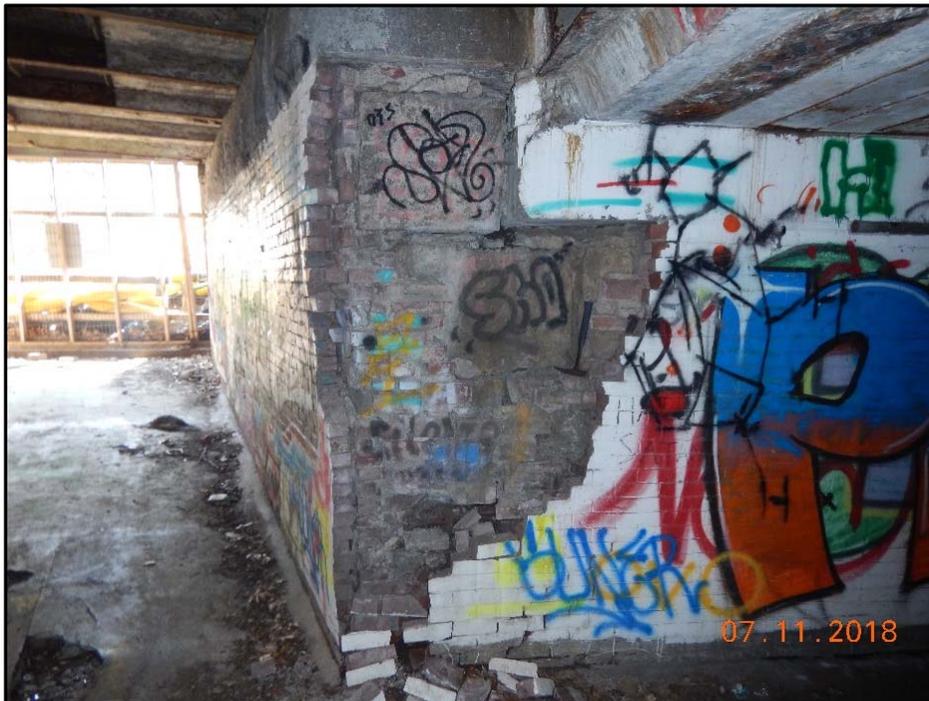


Photo No. 8 – South wall, east corner – up to 5’-0” wide x 8’-1” high area of missing bricks on the first layer and 3’-6” wide x 2’-10” high area of missing bricks to the second layer.



Photo No. 9 – North wall - 100% section loss to the conduit along top.



Photo No. 10 – Fascia Member at Beam 32 - Heavy rust to the channel section.



Photo No. 11 – Panels missing in several areas near MBTA Tunnel section. Shown adjacent to MBTA Tunnel section.



Photo No. 12 – Some ceiling panels exhibit spalling to various extents with exposed reinforcement.



Photo No. 13 – Southern bay, above stairs - Full depth spall.

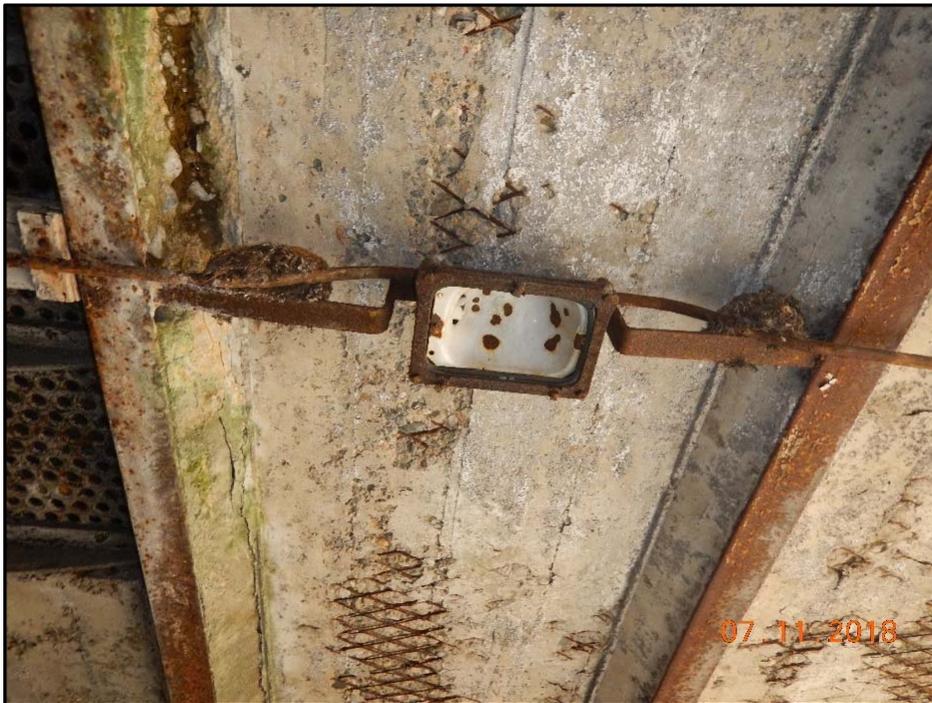


Photo No. 14 – Typical broken light fixtures (shown near south entrance).



Photo No. 15 – Heavy rust and up to 3/8” deep pitting loss to the bottom flange at several beams (shown at Beam 5).



Photo No. 16 – Encasement exhibits cracking, efflorescence and honey combing (shown between Beams 11 and 12).



Photo No. 17 – Utility junction box at the west entrance is missing door.

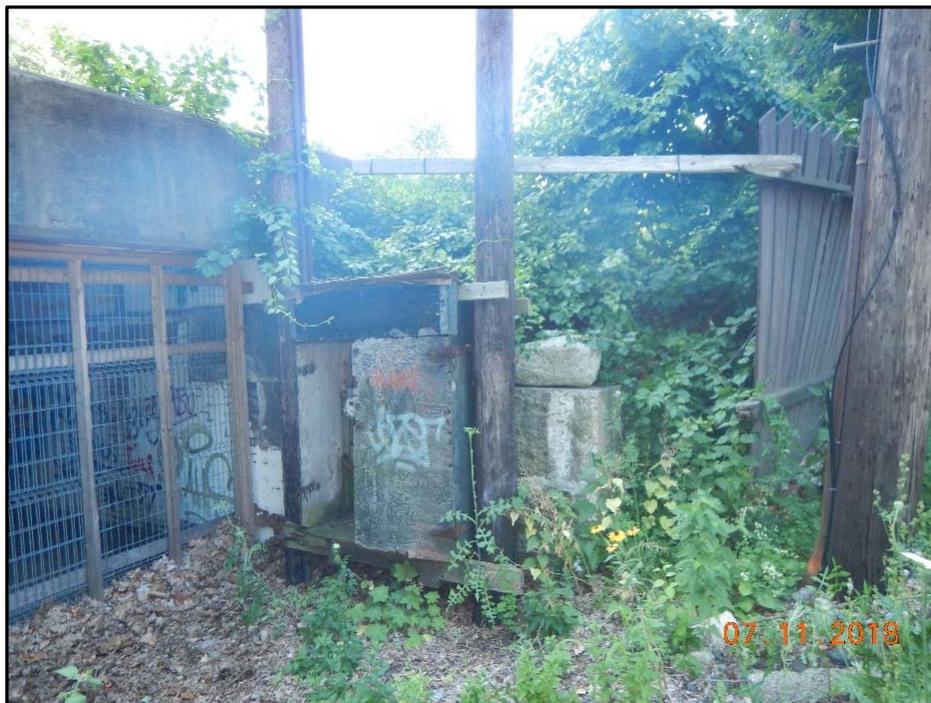


Photo No. 18 – Southwest embankment – Heavy vegetation growth. Similar at northwest embankment.



Photo No. 19 – Northwest retaining wall – Undermined 6'-0" long x full width at base.



Photo No. 20 – Southern entrance - Railing broken around all three sides of stairs. Stairs are misaligned throughout and tree stumps remain on stairs from previous clearing of vegetation.

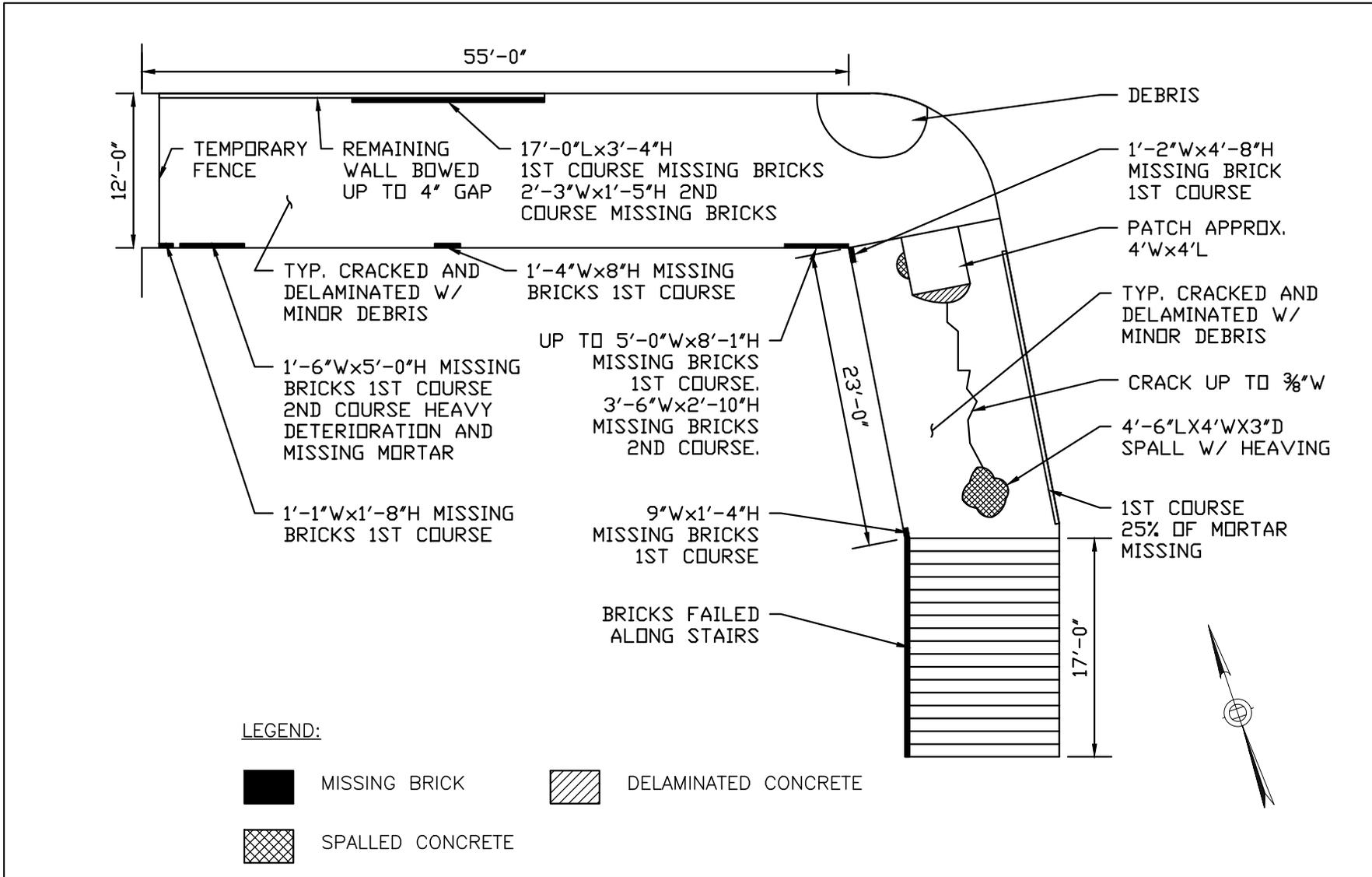


Photo No. 21 – Skylight area covered in debris.



Photo No. 22 – West and south entrances temporarily closed with access restricted by steel mesh fencing (shown at west entrance).

Appendix B: Inspection Sketches

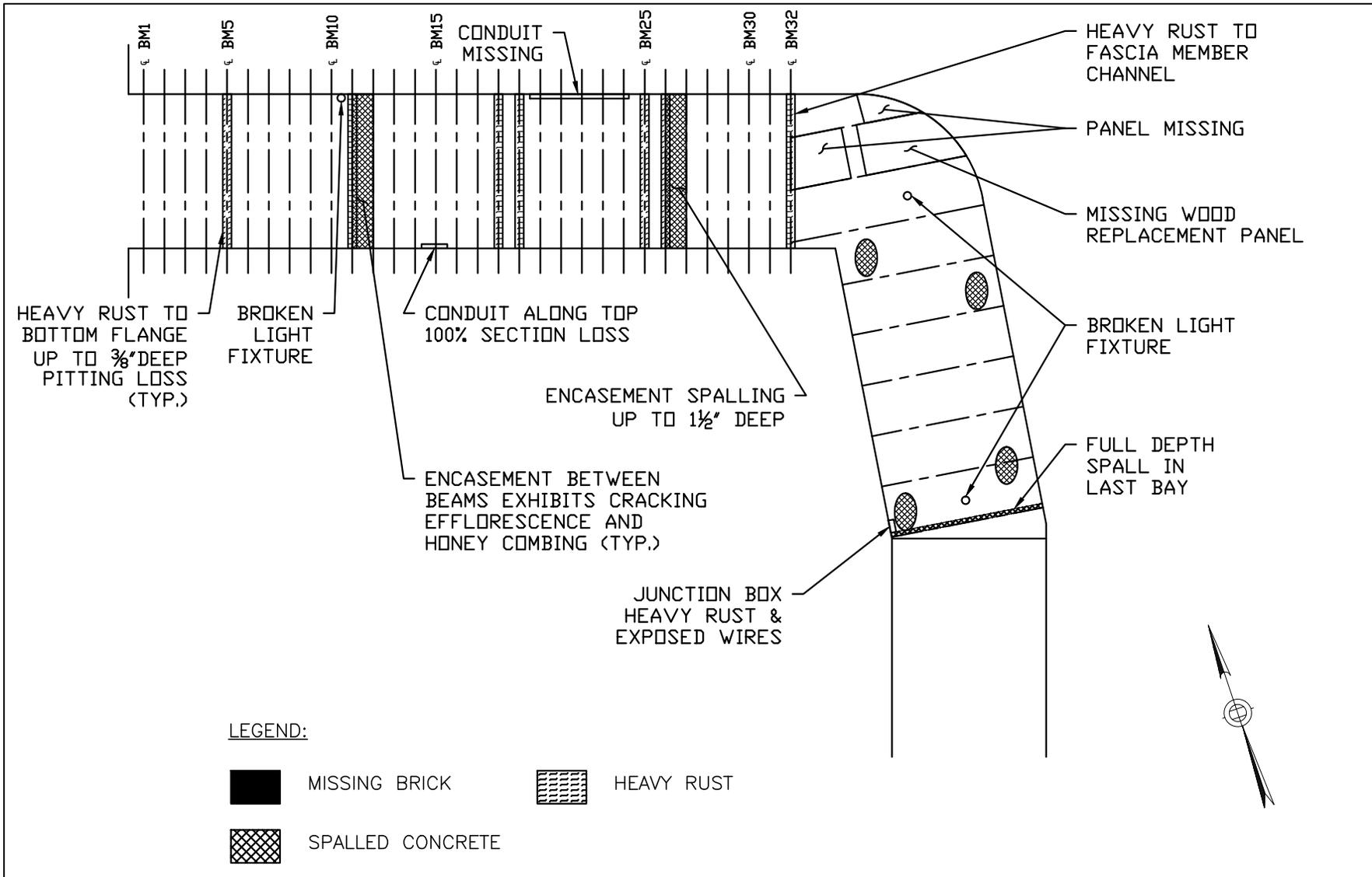


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MBTA RIVERSIDE TUNNEL
FLOOR AND WALL DEFICIENCIES

Tunnel Deficiencies
Riverside Depot
Pedestrian Tunnel
Newton, MA

SK-001



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MBTA RIVERSIDE TUNNEL
CEILING DEFICIENCIES

Tunnel Deficiencies
Riverside Depot
Pedestrian Tunnel
Newton, MA

SK-002

Appendix C: Repair Estimate and Quantities

Cost Estimate for Riverside Depot Pedestrian Tunnel - Option 1 - Restoration

CITY/TOWN: NEWTON
 PROJECT: RIVERSIDE GREENWAY PEDESTRIAN TUNNEL N-12-057 (74A)

E.W.O. #:
 FILE

December 19, 2018

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL VALUE
115.01	PARTIAL DEMOLITION OF N-12-057 (74A)	1	LS	\$32,000.00	\$32,000.00
127.1	REINFORCED CONCRETE EXCAVATION	20	CY	\$550.00	\$11,000.00
706.2	BRICK WALL REMOVED	1400	SY	\$15.00	\$21,000.00
992.1	ALTERATION OF N-12-057 (74A)	1	LS	\$269,200.00	\$269,200.00
107.855	PRESSURE INJECTION OF CRACKS	100	FT	\$75.00	\$7,500.00
706.4	GRANITE STEPS REMOVED AND RESET	1	LS	\$42,500.00	\$42,500.00
806.1	1 INCH ELECTRICAL CONDUIT TYPE RM - GALVANIZED STEEL	200	FT	\$35.00	\$7,000.00
811.90	JUNCTION BOX 30 X 24 X 12 INCHES	1	EA	\$1,000.00	\$1,000.00
823.32	UNDERPASS LIGHTING LUMINAIRE 8 FOOT FLOURESCENT	6	EA	\$1,500.00	\$9,000.00
904.	4000 PSI, 3/4 INCH, 610 CEMENT CONCRETE	20	CY	\$1,100.00	\$22,000.00
910.1	STEEL REINFORCEMENT FOR STRUCTURES - EPOXY COATED	1000	LB	\$6.00	\$6,000.00
915.4	BRICK MASONRY	3400	FT	\$50.00	\$170,000.00
974.02	METAL BRIDGE RAILING REMOVED AND REPLACED	60	FT	\$70.00	\$4,200.00
-	OPTIONAL ALTERATIONS OF N-12-057 (74A)	1	LS	\$92,250.00	\$92,250.00
106.301	CLEAN AND PAINT STRUCTURAL STEEL	630	SF	\$75.00	\$47,250.00
999.1	PRECAST SKYLIGHT PANEL	30	EA	\$1,500.00	\$45,000.00

OPTIONAL SUBTOTAL = \$92,250.00

MANDATORY SUBTOTAL = \$301,200.00

SUBTOTAL = \$393,450.00

NOTE: Unit bid prices based on MassDOT state wide weighted average bid prices (as of December, 2018 and rounded up).

See report for details of restorative option.

20% CONST. ENG. = \$78,690.00

TOTAL= \$472,140

Note that it is assumed this option would require a waiver from the MBTA and/or other State Agencies and its feasibility is unclear at this time.

SAY \$480,000

WITHOUT OPTIONAL REPAIRS SAY \$380,000

JACOBS

PROJECT: Riverside Greenway Pedestrian Tunnel N-12-057 (74A)

FILE NO. E2X81200

SUBJECT: Pedestrian Tunnel Demolition Estimate - Restoration Alternative

SHEET No.

COMPUTED BY: BGH

CHECKED BY: AMR

Rev 12/18

DATE:

Aug-18

115.01 **PARTIAL DEMOLITION OF N-12-057 (74A)** **LS**

127.1 **REINFORCED CONCRETE EXCAVATION** **CY**

Floor Slab

Floor Area =	1035.27	SF
Floor Thickness =	0.67	FT
Volume =	25.56	CY
Assume 50% of floor to be repaired:	12.78	CY

Ceiling Panels

Ceiling Area =	348.00	SF
Panel Thickness =	0.33	FT
Volume =	4.30	CY
Assume 75% of ceiling to be repaired:	3.22	CY

Total Reinforced Concrete Excavation =	16.00	CY
Say	<u>20</u>	<u>CY</u>

706.2 **BRICK WALL REMOVED** **SY**

Note: assume 25% of brick work to be repaired

East-West Wall Area Removed

Brick wall height =	8.00	FT
Total wall length =	110.00	FT
Total area of wall =	880.00	SF
Total area of wall repaired =	660.00	SF

North-South Wall Area Removed

Brick wall height =	8.00	FT
Total wall length =	64.22	FT
Total area of wall =	513.76	SF
Total area of wall repaired =	385.32	SF

Total Brick Masonry Removed =	1045.32	SF
Assume two courses of brick equal 1 foot deep:	1.00	FT
Say	<u>1400</u>	<u>SY</u>

JACOBS

PROJECT: Riverside Greenway Pedestrian Tunnel N-12-057 (74A)
 SUBJECT: Pedestrian Tunnel Alteration Estimate - Restoration Alternative
 COMPUTED BY: BGH CHECKED BY: AMR

FILE NO. E2X81200
 SHEET No.
 DATE: Aug-18

Rev 12/18

823.32 UNDERPASS LIGHTING LUMINAIRE 8 FOOT FLOURESCENT EA

Number of Luminaires

Previous number of fixtures = 6 EA
Say 6 EA

904. 4000 PSI, 3/4 INCH, 610 CEMENT CONCRETE CY

Match value of reinforced concrete excavation from above:

Volume = 20.00 CY
 Total Volume of 4000 psi, 3/4 in., 610 HP Cement Concrete = 20.0 CY
Say 20 CY

910.1 STEEL REINFORCEMENT FOR STRUCTURES - EPOXY COATED LB

Assumed steel density in concrete = 100.00 LB/CY
 Volume of concrete = 20.00 CY
 Weight of steel reinforcement = 2000.00 LB
Say 1000 LB

915.4 BRICK MASONRY SF

Note: Optional Work

Area of brick

Area of walls = 1393.76 SF
 Courses of brick = 2 EA
 Total area of brick = 2787.52 SF
Say 3400 SF

974.02 METAL BRIDGE RAILING REMOVED AND REPLACED FT

Railing at South Entrance

Length of Railing (measured from plans) = 48 FT
 Add 20% = **Say 60 FT**

999.1 PRECAST SKYLIGHT PANEL EA

Number of Panels = 27 EA
Say 30 EA

Cost Estimate for Riverside Depot Pedestrian Tunnel - Option 2 - Improvement

CITY/TOWN: NEWTON
 PROJECT: RIVERSIDE GREENWAY PEDESTRIAN TUNNEL N-12-057 (74A)

E.W.O. #:
 FILE

December 19, 2018

ITEM #	DESCRIPTION	QTY	UNIT	UNIT PRICE	TOTAL VALUE
115.01	PARTIAL DEMOLITION OF N-12-057 (74A)	1	LS	\$67,027.80	\$67,027.80
127.1	REINFORCED CONCRETE EXCAVATION	37	CY	\$550.00	\$20,527.80
706.2	BRICK WALL REMOVED	1,400	SF	\$15.00	\$21,000.00
710.5	REMOVAL OF GRANITE STEPS	17	EA	\$1,500.00	\$25,500.00
992.1	ALTERATION OF N-12-057 (74A)	1	LS	\$452,808.94	\$452,808.94
204.	GUTTER INLET	8	EA	\$2,000.00	\$16,000.00
234.12	12 INCH DRAINAGE PIPE	450	FT	\$80.00	\$36,000.00
806.1	1 INCH ELECTRICAL CONDUIT TYPE RM - GALVANIZED STEEL	200	FT	\$35.00	\$7,000.00
811.90	JUNCTION BOX 30 X 24 X 12 INCHES	1	EA	\$1,000.00	\$1,000.00
823.32	UNDERPASS LIGHTING LUMINAIRE 8 FOOT FLOURESCENT	6	EA	\$1,500.00	\$9,000.00
904.	4000 PSI, 3/4 INCH, 610 CEMENT CONCRETE	84	CY	\$1,100.00	\$92,408.94
910.1	STEEL REINFORCEMENT FOR STRUCTURES - EPOXY COATED	16,900	LB	\$6.00	\$101,400.00
915.4	BRICK MASONRY	3,400	SF	\$50.00	\$170,000.00
960.1	STRUCTURAL STEEL - COATED STEEL	1,650	LB	\$10.00	\$16,500.00
974.02	METAL BRIDGE RAILING REMOVED AND REPLACED	50	FT	\$70.00	\$3,500.00
-	OPTIONAL ALTERATIONS OF N-12-057 (74A)	1	LS	\$67,500.00	\$67,500.00
106.301	CLEAN AND PAINT STRUCTURAL STEEL	300	SF	\$75.00	\$22,500.00
999.1	PRECAST SKYLIGHT PANEL	30	EA	\$1,500.00	\$45,000.00

OPTIONAL SUBTOTAL =	\$67,500.00
MANDATORY SUBTOTAL =	\$519,836.75
SUBTOTAL =	\$587,336.75
20% CONST. ENG. =	\$117,467.35
TOTAL=	\$704,804
SAY	\$710,000

NOTE:

Unit bid prices based on MassDOT state wide weighted average bid prices (as of December, 2018 and rounded up).

The improvement alternative proposed includes restoration of the tunnel and brick. The improvement is the addition of an accessible ramp to replace the granite steps.

JACOBS

PROJECT: Riverside Greenway Pedestrian Tunnel N-12-057 (74A)

FILE NO. E2X81200

SUBJECT: Pedestrian Tunnel Demolition Estimate - Improvement Alternative

SHEET No.

COMPUTED BY: BGH

CHECKED BY: AMR

Rev 12/18

DATE:

Sep-18

115.01 **PARTIAL DEMOLITION OF N-12-057 (74A)** **LS**

127.1 **REINFORCED CONCRETE EXCAVATION** **CY**

Floor Slab

Floor Area =	1035.27	SF
Floor Thickness =	0.67	FT
Volume =	25.56	CY

Ceiling Panels

Ceiling Area =	348.00	SF
Panel Thickness =	0.33	FT
Volume =	4.30	CY

Total Reinforced Concrete Excavation = 29.86 CY

Say **37** **CY**

706.2 **BRICK WALL REMOVED** **SY**

Note: assume 75% of masonry to be repaired

East-West Wall Area Removed

Brick wall height =	8.00	FT
Total wall length =	110.00	FT
Total area of wall =	880.00	SF
Total area of wall repaired =	660.00	SF

North-South Wall Area Removed

Brick wall height =	8.00	FT
Total wall length =	64.22	FT
Total area of wall =	513.76	SF
Total area of wall repaired =	385.32	SF

Total Brick Masonry Removed = 1045.32 SF

Say **1400** **SF**

710.5 **REMOVAL OF GRANITE STEPS** **EA**

Number of Steps = 17 EA

Say **17** **EA**

JACOBS

PROJECT: Riverside Greenway Pedestrian Tunnel N-12-057 (74A)
SUBJECT: Pedestrian Tunnel Alteration Estimate - Improvement Alternative
COMPUTED BY: BGH CHECKED BY: AMR

FILE NO. E2X81200
SHEET No.
Rev 12/18 DATE: Sep-18

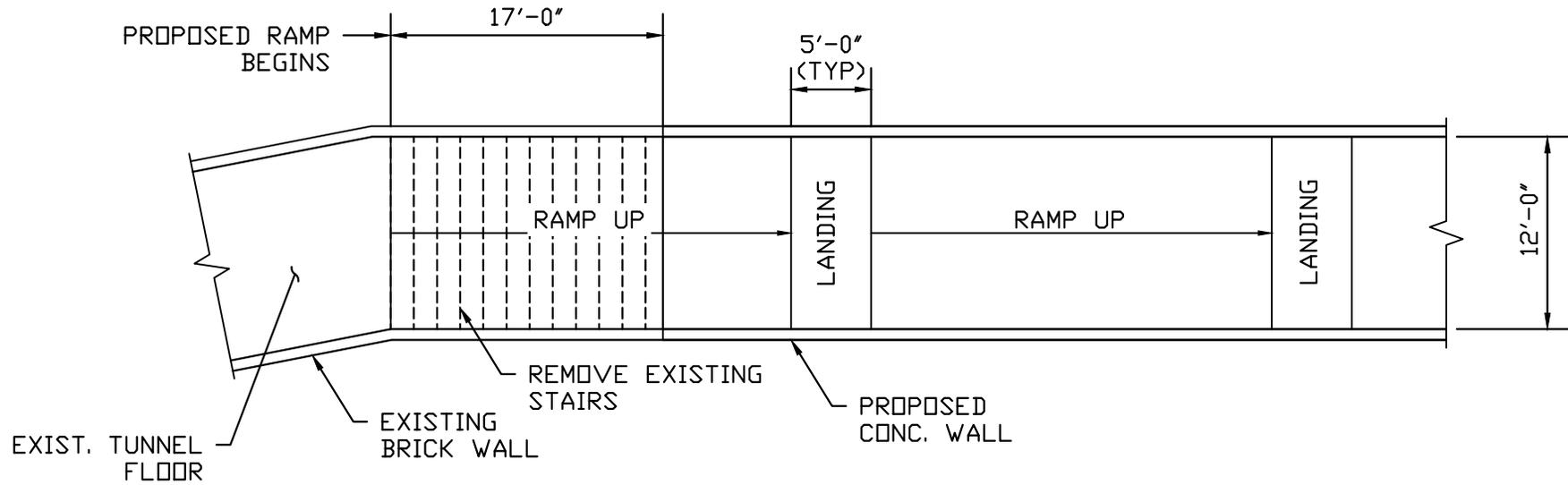
999.2	<u>PRECAST SKYLIGHT PANEL</u>			EA
	Number of Panels =		27	EA
		Say	<u>30</u>	<u>EA</u>

Drainage Items:

204.	<u>GUTTER INLET</u>			EA
	<u>Assume 8 structures needed:</u>			
		Say	<u>8</u>	<u>EA</u>

234.12	<u>12 INCH DRAINAGE PIPE</u>			FT
	<u>Length of conduit required</u>			
	Length along walls =		133	FT
	Assume two pipes		266.0	FT
		Add 50% for connections, etc. =	412.3	FT
		Say	<u>450</u>	<u>FT</u>

Appendix D: Proposed Ramp Sketches (Option 2)

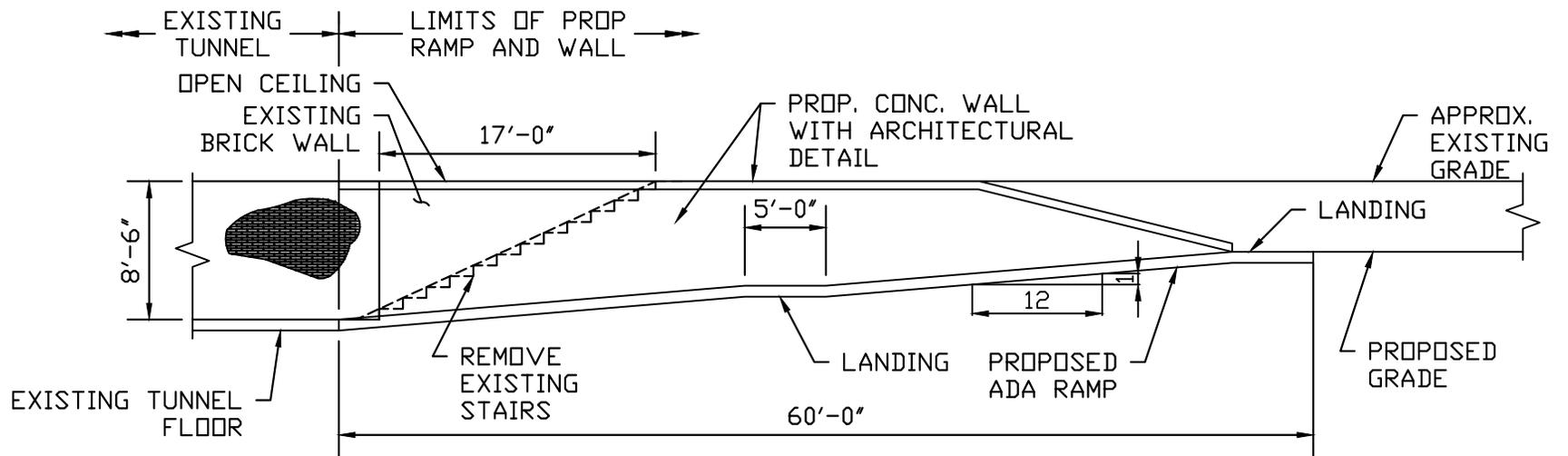


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MBTA RIVERSIDE TUNNEL
ADA ACCESSIBLE RAMP PLAN

Tunnel Assessment
Riverside Depot
Pedestrian Tunnel
Newton, MA

SK-001

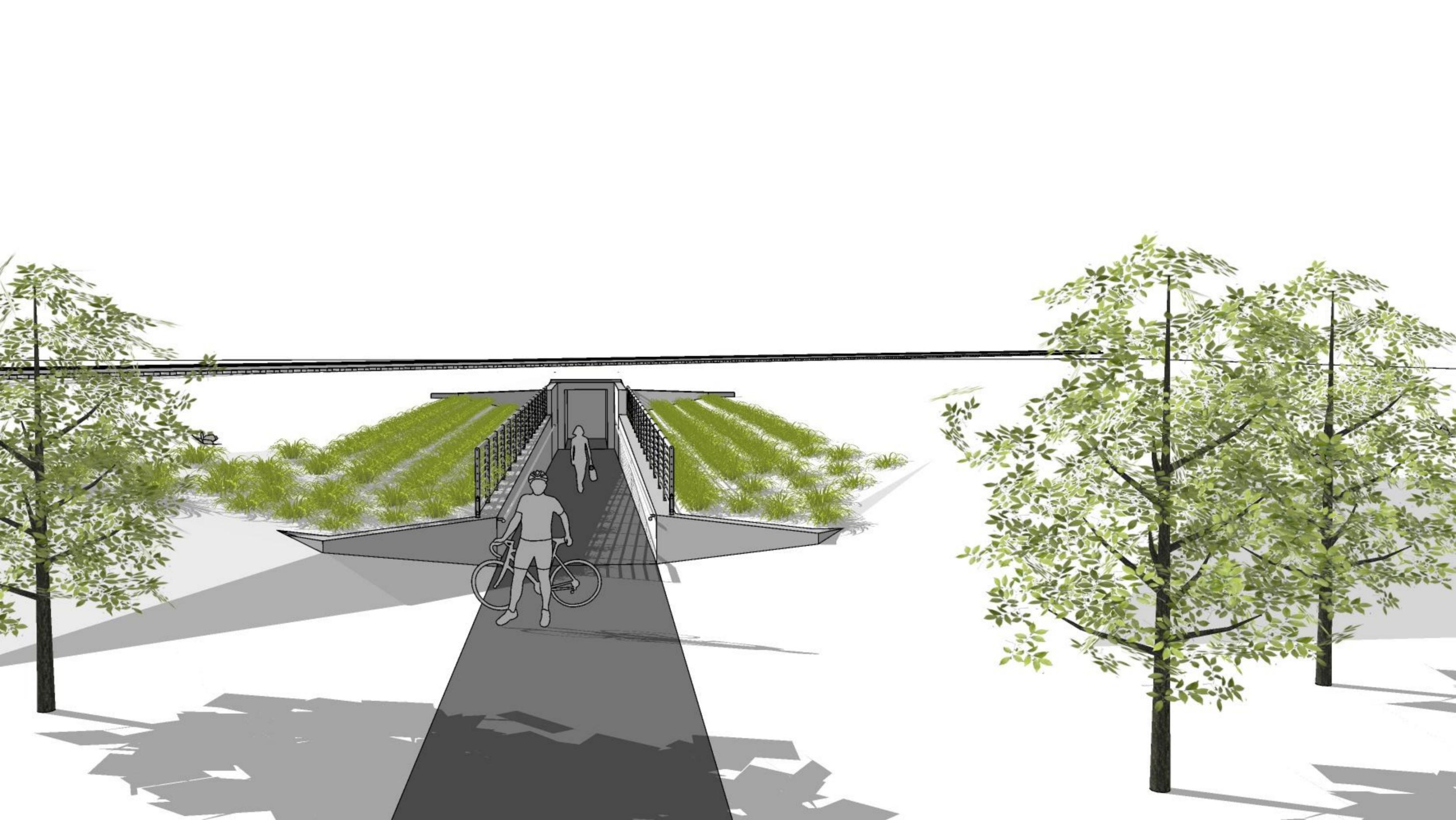


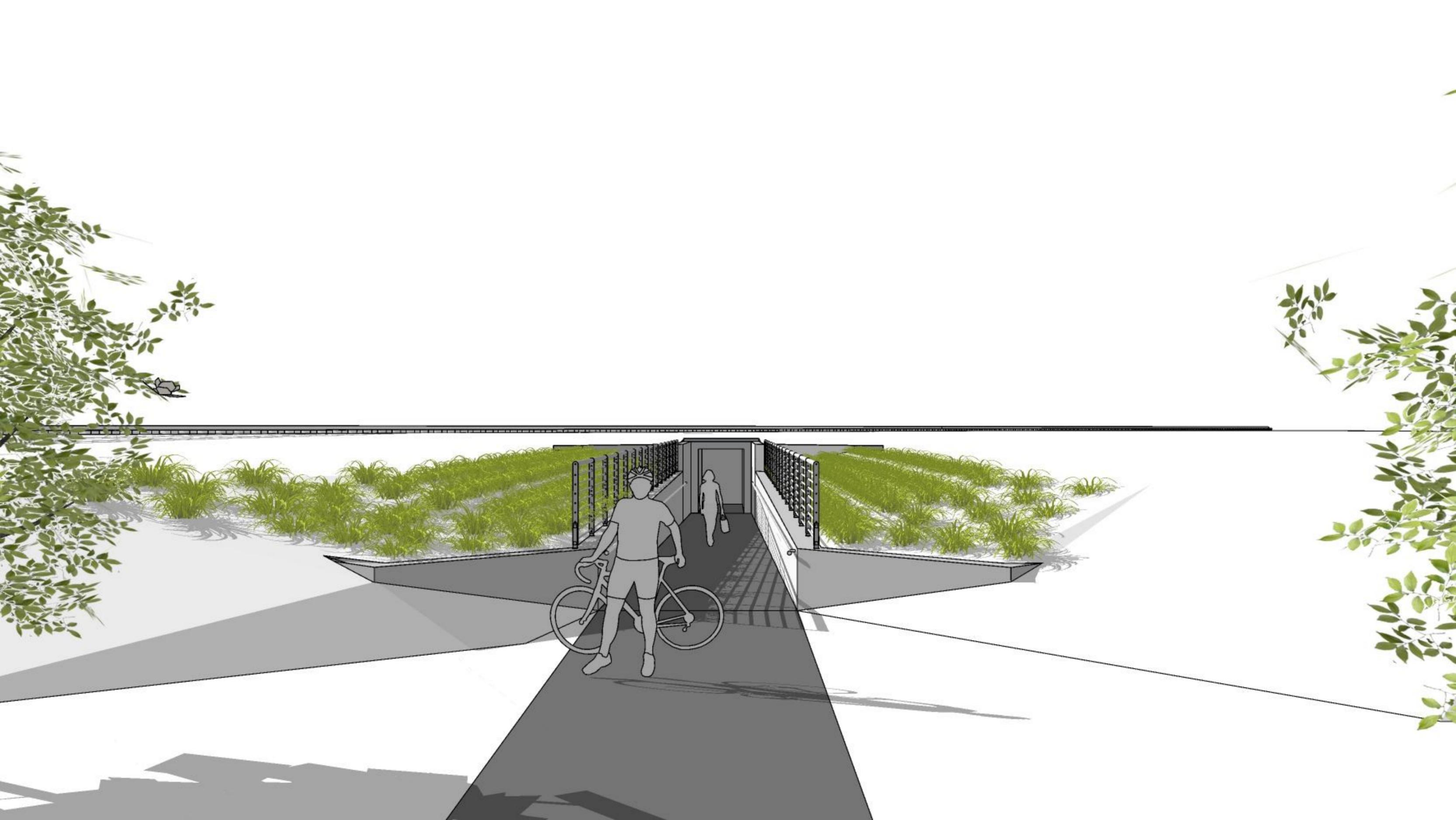
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MBTA RIVERSIDE TUNNEL
ACCESSIBLE RAMP ELEVATION

Tunnel Assessment
Riverside Depot
Pedestrian Tunnel
Newton, MA

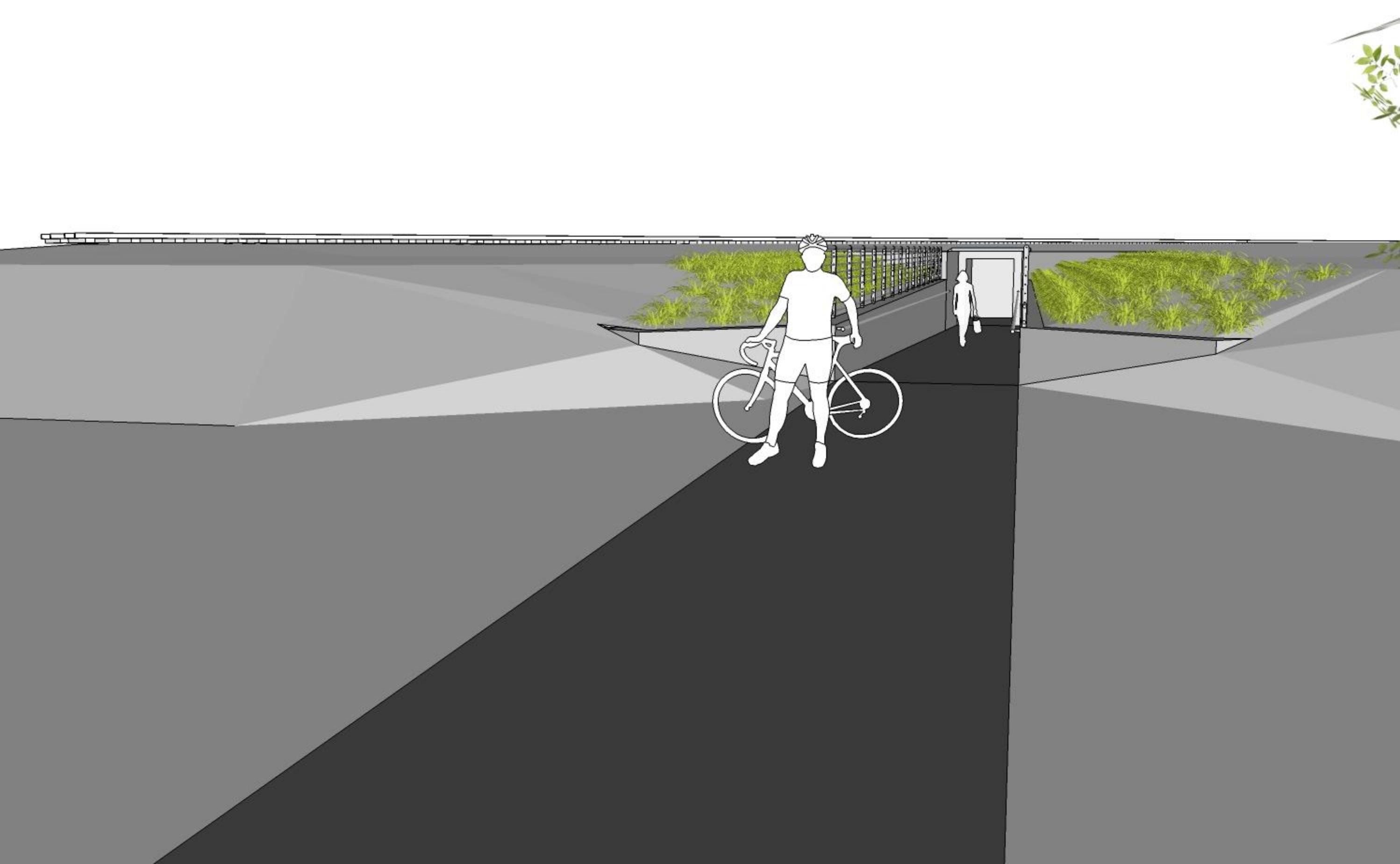
SK-002

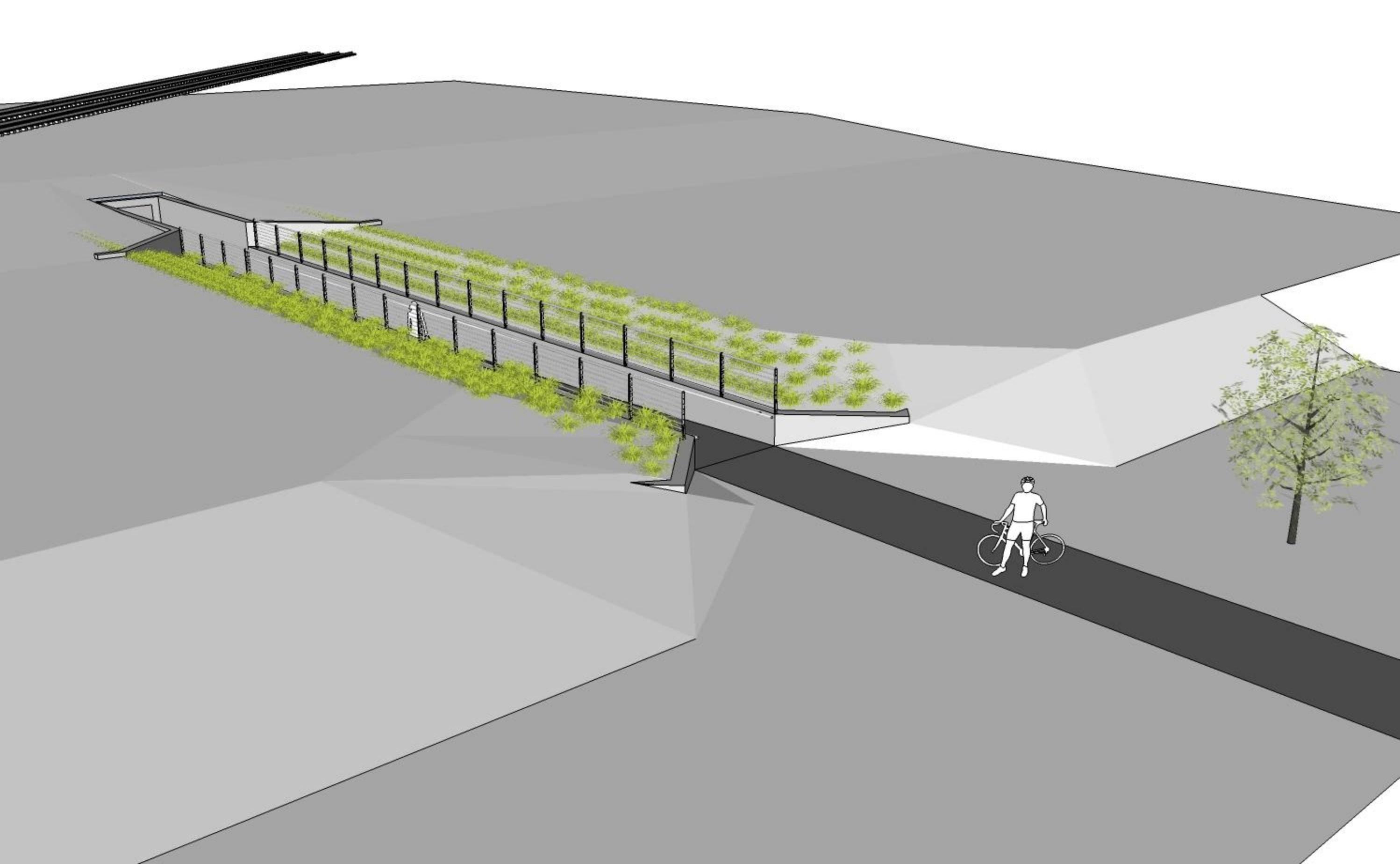


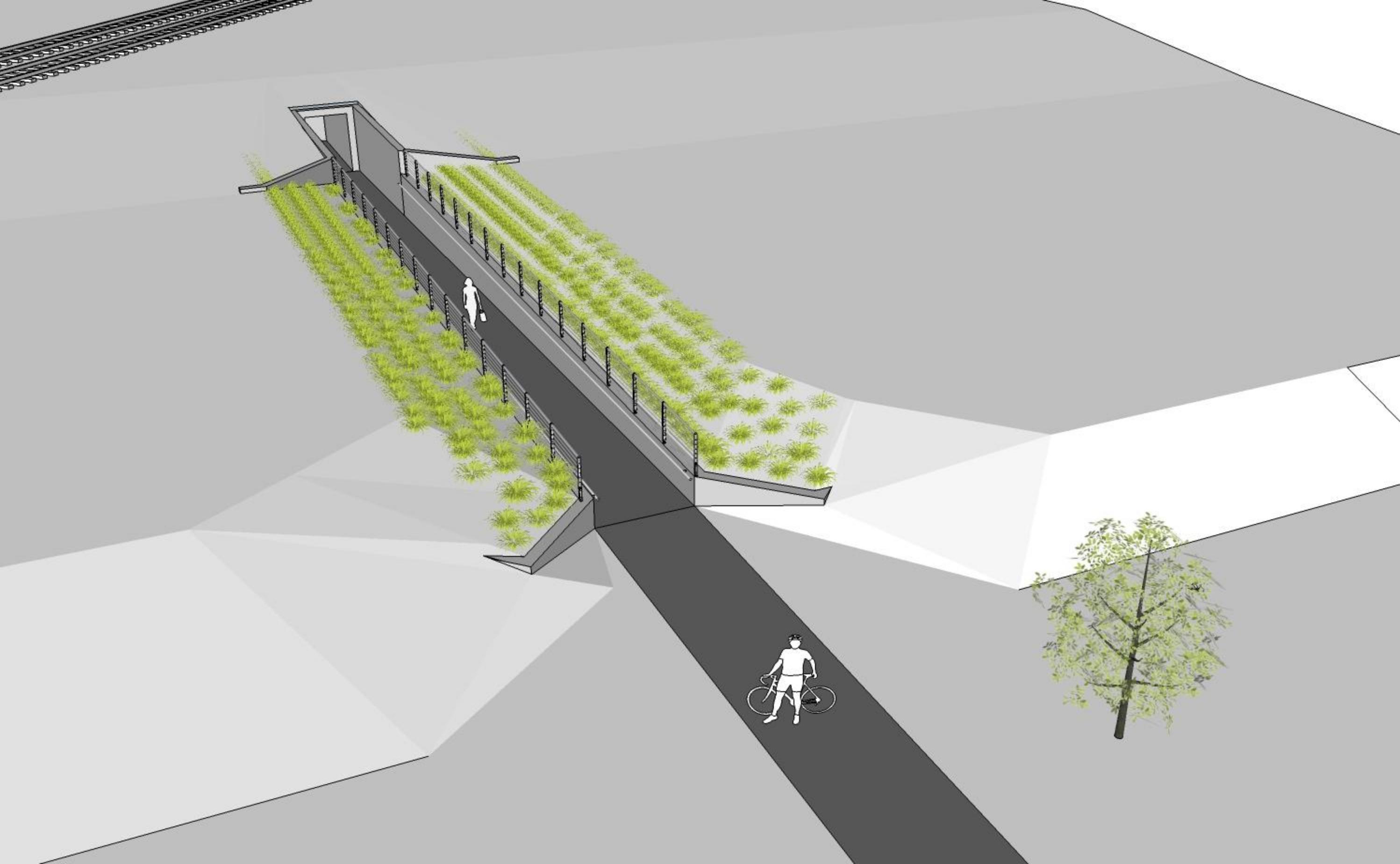


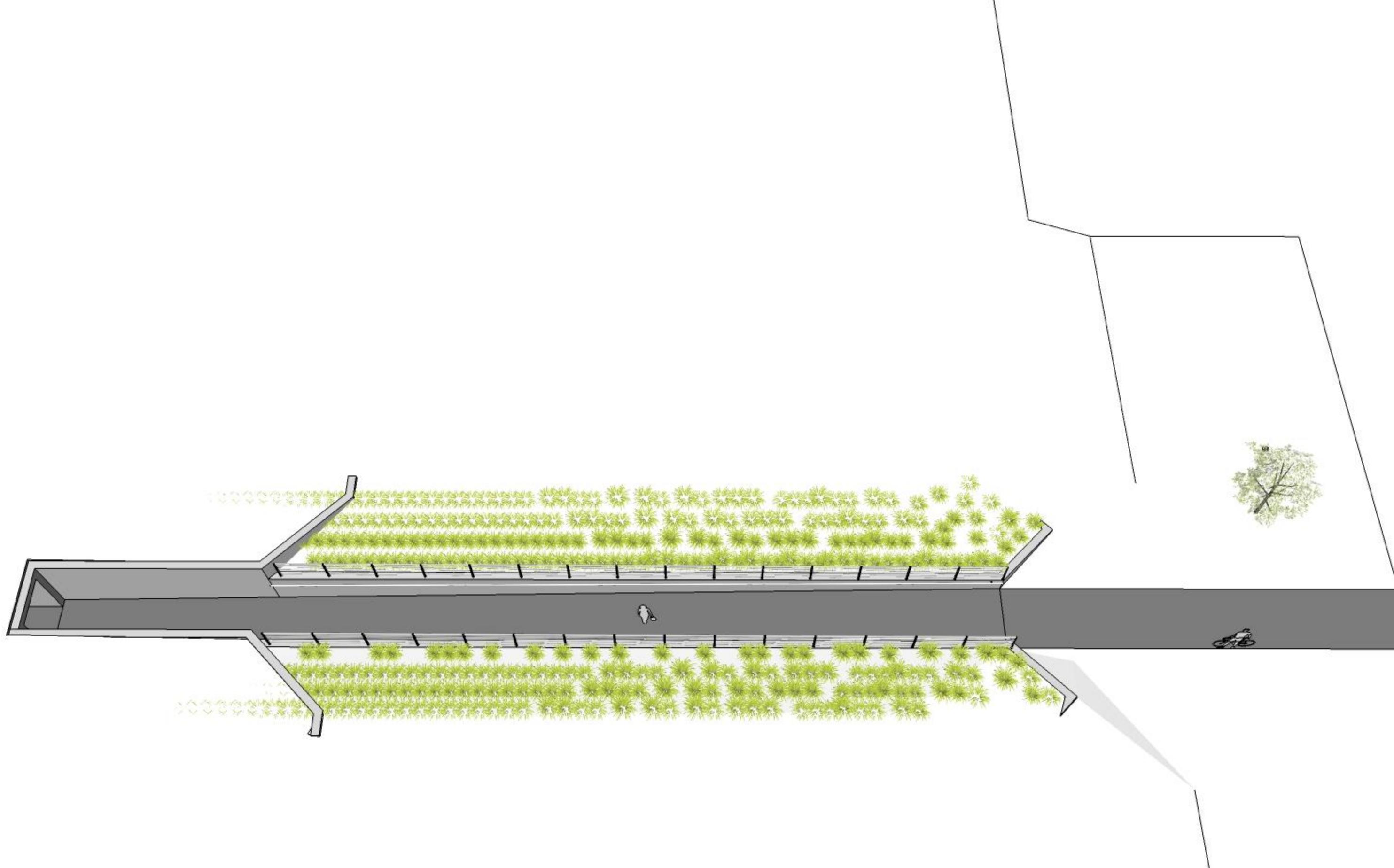




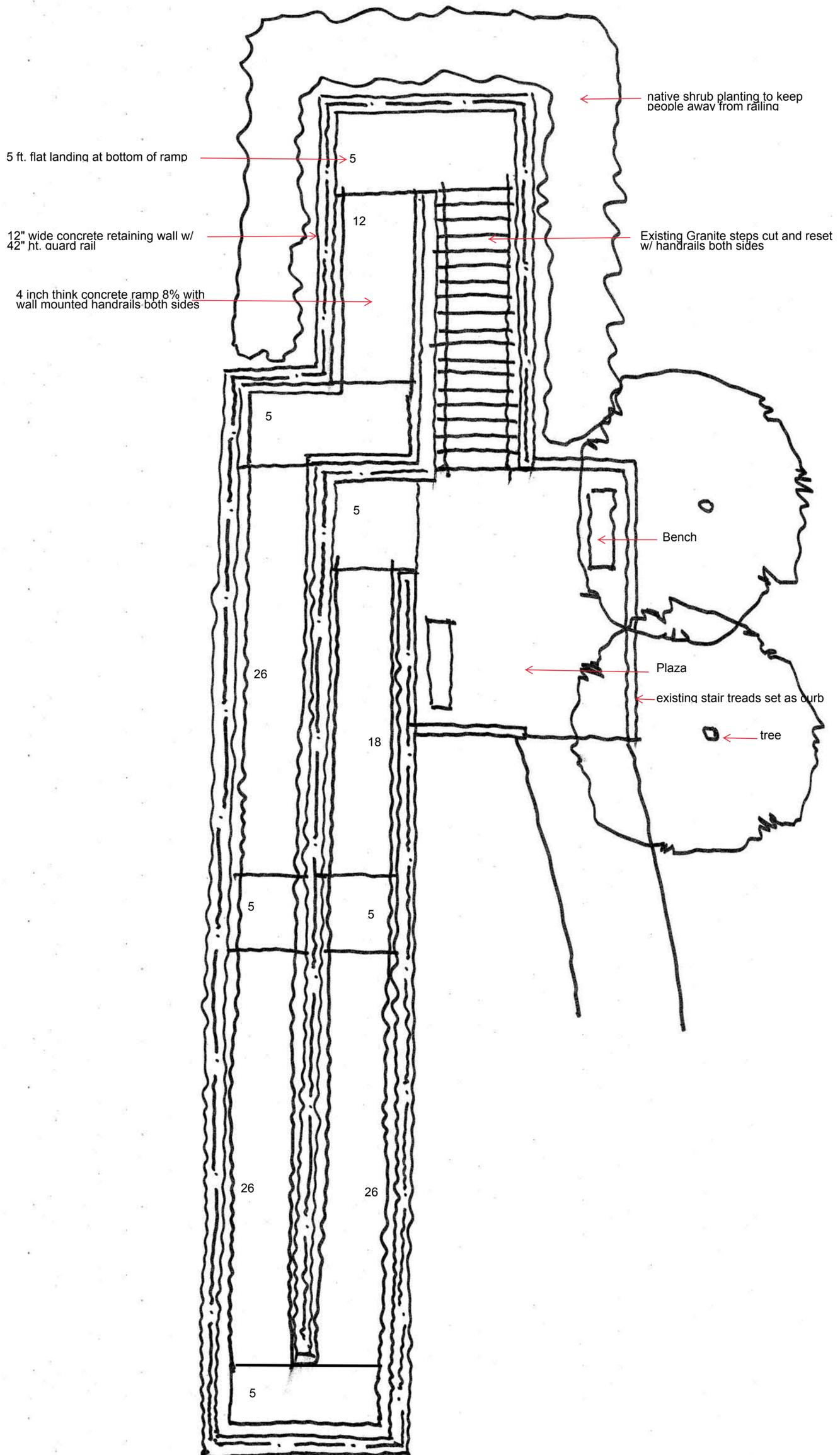














Memorandum

120 St. James Avenue, 5th Floor
Boston, Massachusetts 02116

www.jacobs.com

Subject Summary - Riverside Greenway Public Meeting #1

Attention Riverside Greenway Working Group

From Dieckmann Cogill, Beth Isler

Date September 24, 2018

Copies to

On September 17, 2018, the Riverside Greenway Working Group held a public meeting to solicit input from the community on the Riverside Greenway project. The meeting was held at the Auburndale Community Library. The evening kicked off with introductions and a slide presentation (attached) followed by smaller group discussions in which attendees could visit large format maps and boards to talk about each of the five sub-study areas and the project Vision and Goals. Attendees were invited to write comments, ideas, and concerns on post-it notes and attach them to the boards.

The discussions focused on four main points:

1. Connections and access throughout the study area, particularly to the Charles River and to the MBTA Riverside T station
2. Crossing Commonwealth Avenue safely
3. Making use of Commonwealth Avenue's Carriage Lanes for people walking, running, biking, etc.
4. Calming traffic to improve safety for all users

The table below organizes the comments into these four categories as applicable. There was support for the preliminary draft greenway alignments, as well as suggestions for new alignments. The study area map has been updated to show these new alignments, and is provided after the table.

Connections and access
<ul style="list-style-type: none"> • Restore the walking loop through Riverside Park using the Pony Truss and Charles St bridges and RR underpass • Add sidewalks [Commonwealth Avenue] • Charles Street and tunnel could give Pigeon Hill area good access to Riverside • Why not have a path along the river? Yes! • Plans to renovate/utilize Norumbega Park? More than just a dog park? • Trail signage from commuter rail station • Social issue of people who work and live in apartments to get to public transportation access to Riverside? Marriott employees?

- Identify precise segments that can be constructed in phases as opportunities present themselves
- Marriott employees use Riverside station and walk to Marriott to get to work
- Historical markers for Norumbega Park? [was this referring to the need for them? Or the preservation of existing?]
- Instead of Comm Ave, why not connect through Norumbega?
- Boardwalk under [MassPike] bridge/over river to bank on the other side
- Renovate old walking path
- I want a trail running between the houses (on Oakland Ave) and the river
- Signage/connection to Weston Aqueduct trail [west of Route 95/128]
- Park [east of Charles St and immediately north of Pike]
- Parking concerns on Charles St
- Get buy-in from MassDOT to get under I-90 early and often for Pigeon Hill Road connection
- Seek connections along river rather than up on Pigeon Hill Road
- Evergreen and Oakland are too steep for some cyclists or for ADA compatibility
- There needs to be better access to the river
- Stroller access
- Triangle between Pike and Commuter Rail is a lost area now. Needs access.
- Walking path from Pigeon Hill and Charles Street to Riverside would be great (through Depot Tunnel)
- Clarify a phased project to account for current opportunities and future opportunities
- I'd like to see SAFE walking trails for Lower Falls to Riverside-Williams School- and access to river by boathouse
- Walking access between Pigeon Hill and Riverside is key!
- Consider utilizing land at rear of Riverside "yard" for at grade path or gradual descent path to Pony Truss Trail grade (ask Jennifer Steel)
- Connect Pony Truss Trail to office park at Riverside Center and Riverside Station to avoid ½ mile walk around Riverside
- Northern access to Riverside station?!
- Connect neighborhoods east of Pony Truss (between Riverside MBTA and commuter rail line) to trail network and Riverside MBTA
- We love walking to this bridge but the trails/access need improvement

Crossing Commonwealth Avenue safely

- Crosswalks on Commonwealth
- Both Comm Ave crossings have good sight lines for signalization. The Oakland one already has eastbound signals, but no crosswalk or walk cycle

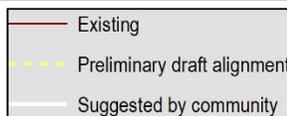
- Don't have people cross at the dangerous intersection by the Marriott/boathouse/gas station. It's dangerous for cars. Adding pedestrians to this would be a nightmare
- Slower, more crossings
- Lights for crossing
- Raise road at crossing
- Crossing Comm Ave to get to Norumbega area is SO dangerous. Our neighbor was hit by a car here.

Commonwealth Avenue's Carriage Lanes

- Continue Carriage Lane from Islington to the river to:
 - Improve safety at Auburn, Bourne for cars and pedestrians
 - Provide improved access to dog park to be and Norumbega Conservation area and Lyons Park
- Restoration of Carriage Road on Comm Ave would make it a lot easier for users of Norumbega Park and new dog park adjacent to Comm Ave and make parking design much easier. It would provide easier crossing access to park users from south side of Comm Ave

Calming traffic to improve safety for all users

- Fix Commonwealth-Auburn intersection so drivers from Auburn St don't have to merge with fast through traffic to reach 128 north
- Better intersection by Marriott/boathouse; dangerous
- Auburn Street is fast-moving and needs traffic calming.



Service Layer Credits: Esri, HERE, Garmin, ©
OpenStreetMap contributors, and the GIS user
community
Source: Esri, DigitalGlobe, GeoEye, Earthstar
Geographics, CNES/Airbus DS, USDA, USGS,



The following sections summarize all of the input received in each of the smaller discussion groups.

1. Vision and Goals

Riverside Greenway Conceptual Plan	
Study Area	Vision & Goals
	<p>Vision: Link communities and bring people together to share in a common natural resource.</p> <p>Goals</p> <ul style="list-style-type: none"> • Improve access to the river and/or greenway for people walking, biking, or taking part in other activities. • Improve circulation and open-space connections along the river corridor. • Protect and enhance the character of open space and the shoreline along the River. • Protect and improve visual/scenic quality. • Limit potential conflicts between activities. <hr/> <p>What are your thoughts about the draft goals? How would you change them? Write your comment on a sticky note and post below.</p> <hr/> <p><i>creating connections / restoring a legacy</i></p>

- Restore the walking loop through Riverside Park using the Pony Truss and Charles St bridges and RR underpass

2. Commonwealth Avenue

Riverside Greenway Conceptual Plan

Commonwealth Avenue

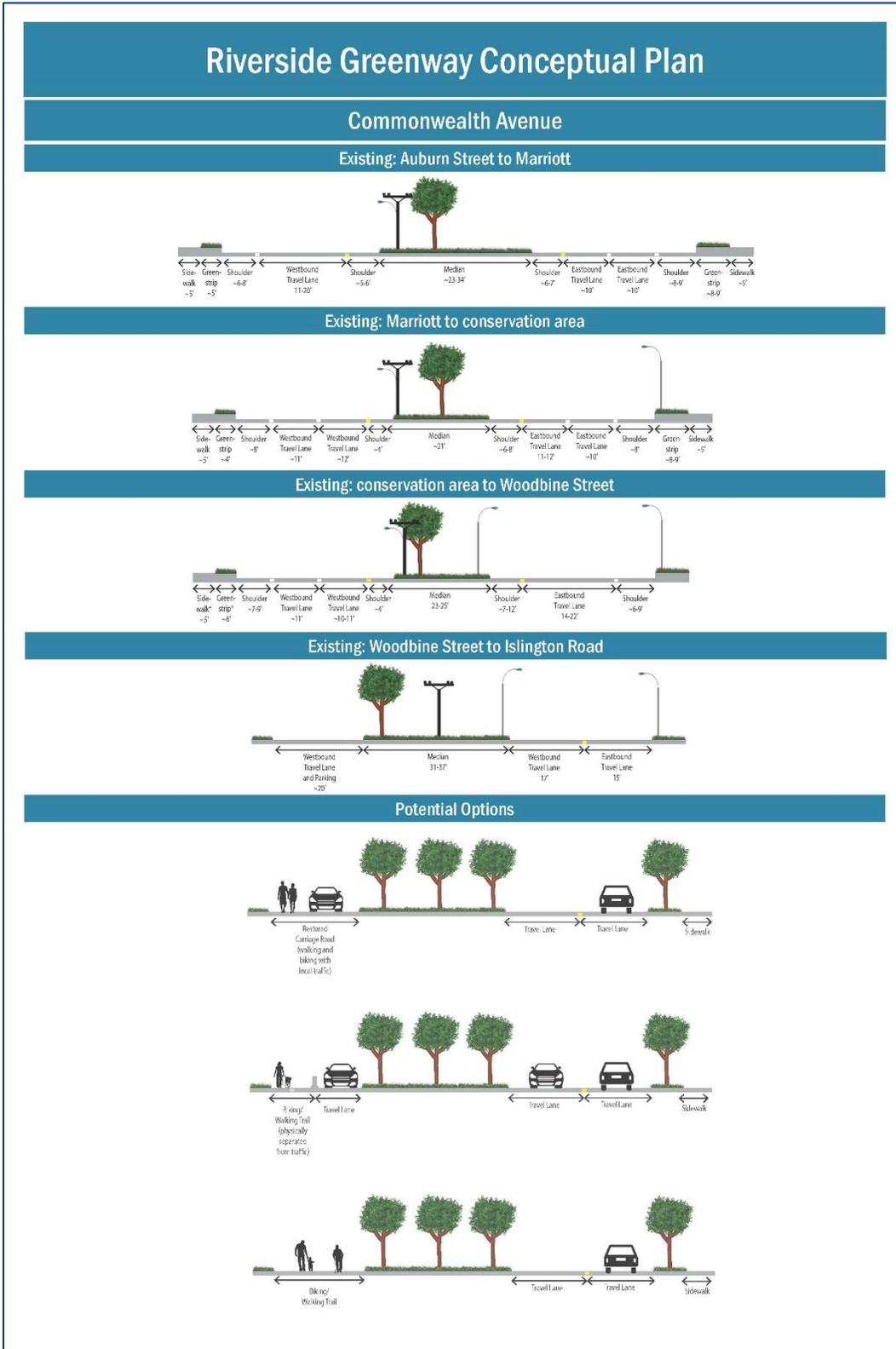
Commonwealth Avenue

	Existing
	Potential alignment
	Potential crossing location

0 125 250 375 500 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar, IGN, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

What do you think of this area?
What would you like to see done here?
Write your comment on a sticky note and post it below.



- Fix Commonwealth-Auburn intersection so drivers from Auburn St don't have to merge with fast through traffic to reach 128 north
- Crosswalks on Commonwealth
- Both Comm Ave crossings have good sight lines for signalization. The Oakland one already has eastbound signals, but no crosswalk or walk cycle
- Don't have people cross at the dangerous intersection by the Marriott/boathouse/gas station. It's dangerous for cars. Adding pedestrians to this would be a nightmare
- Continue Carriage Lane from Islington to the river to:
 - Improve safety at Auburn, Bourne for cars and pedestrians
 - Provide improved access to dog park to be and Norumbega Conservation area and Lyons Park
- Add sidewalks
- Better intersection by Marriott/boathouse; dangerous
- Charles Street and tunnel could give Pigeon Hill area good access to Riverside
- Slower, more crossings
- Why not have a path along the river? Yes!
- Lights for crossing
- Raise road at crossing
- Restoration of Carriage Road on Comm Ave would make it a lot easier for users of Norumbega Park and new dog park adjacent to Comm Ave and make parking design much easier. It would provide easier crossing access to park users from south side of Comm Ave
- Plans to renovate/utilize Norumbega Park? More than just a dog park?
- Trail signage from commuter rail station
- Social issue of people who work and live in apartments to get to public transportation access to Riverside? Marriott employees?
- Identify precise segments that can be constructed in phases as opportunities present themselves
- Marriott employees use Riverside station and walk to Marriott to get to work
- Historical markers for Norumbega Park?
- Instead of Comm Ave, why not connect through Norumbega?

3. Pigeon Hill

Riverside Greenway Conceptual Plan

Pigeon Hill

Pigeon Hill

— Existing ● Potential crossing location
- - - Potential alignment

0 125 250 375 500 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and

What do you think of this area?
What would you like to see done here?
 Write your comment on a sticky note and post it below.

- Crossing Comm Ave to get to Norumbega area is SO dangerous. Our neighbor was hit by a car here.
- Auburn Street is fast-moving and needs traffic calming.
- Boardwalk under [MassPike] bridge/over river to bank on the other side
- Renovate old walking path

Summary - Riverside Greenway Public Meeting #1
September 24, 2018

- I want a trail running between the houses (on Oakland Ave) and the river
- Signage/connection to Weston Aqueduct trail
- Park [east of Charles St and immediately north of Pike]
- Parking concerns on Charles St
- Get buy-in from MassDOT to get under I-90 early and often for Pigeon Hill Road connection
- Seek connections along river rather than up on Pigeon Hill Road
- Evergreen and Oakland are too steep for some cyclists or for ADA compatibility

4. MassPike to Commuter Rail

Riverside Greenway Conceptual Plan

MassPike to Commuter Rail Line

MassPike to Commuter Rail

Existing
 Potential alignment

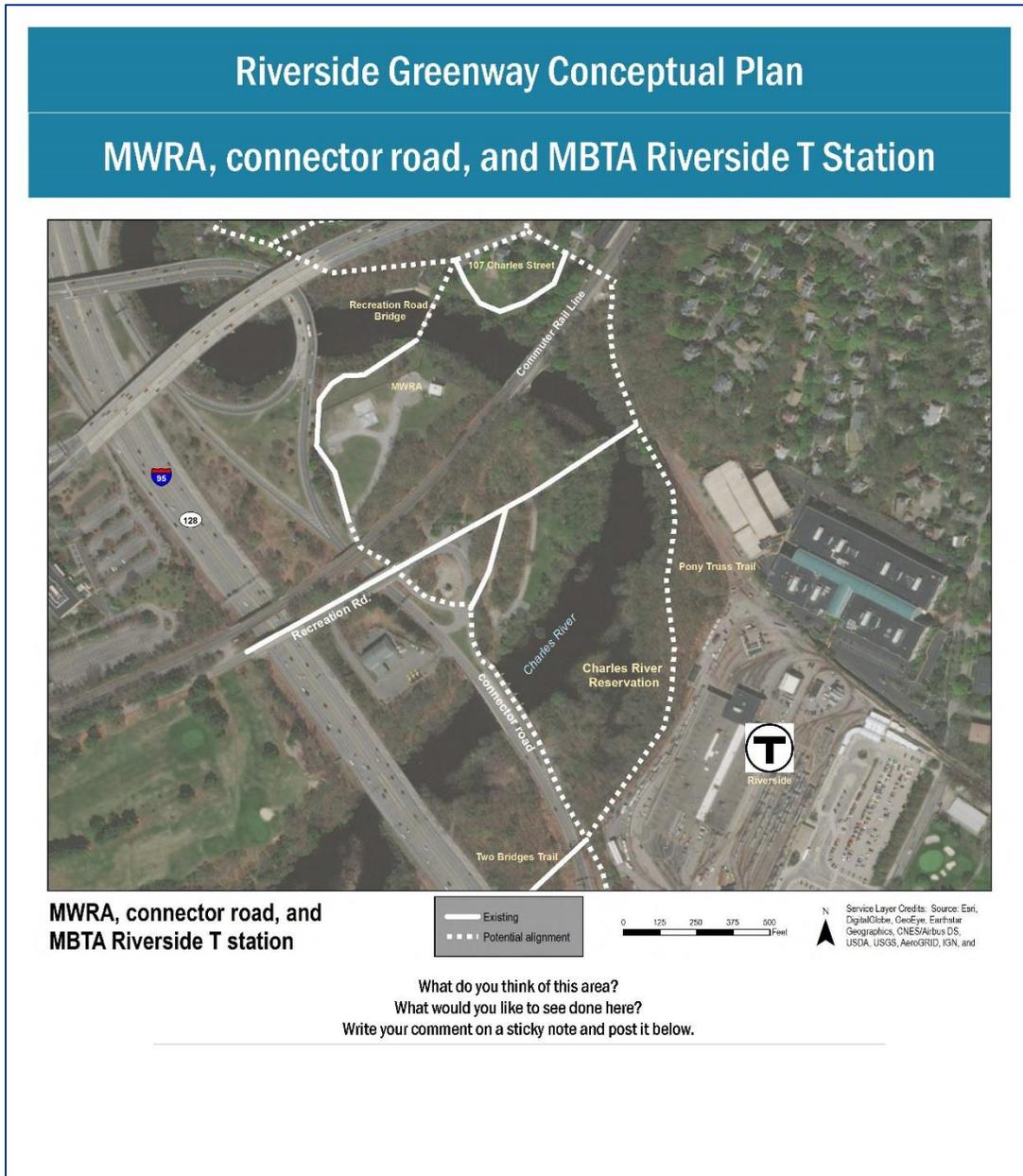
0 75 150 225 300 Feet

Service Layer Credits: Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNR/S/Airbus DS, USDA, USGS, AeroGRID, IGN, and

What do you think of this area?
What would you like to see done here?
 Write your comment on a sticky note and post it below.

- There needs to be better access to the river.
- Stroller access
- Parking concerns on Charles Street
- Triangle between Pike and Commuter Rail is a lost area now. Needs access.

- Walking path from Pigeon Hill and Charles Street to Riverside would be great (through Depot Tunnel)
5. **MWRA, connector road...**



- Clarify a phased project to account for current opportunities and future opportunities
- I'd like to see SAFE walking trails for Lower Falls to Riverside-Williams School- and access to river by boathouse

- Walking access between Pigeon Hill and Riverside is key!
- Consider utilizing land at rear of Riverside “yard” for at grade path or gradual descent path to Pony Truss Trail grade (ask Jennifer Steel)
- Connect Pony Truss Trail to office park at Riverside Center and Riverside Station to avoid ½ mile walk around Riverside
- Northern access to Riverside station?!
- Connect neighborhoods east of Pony Truss (between Riverside MBTA and commuter rail line) to trail network and Riverside MBTA

6. What else do you want us to know?

Riverside Greenway Conceptual Plan	
Next Steps for Conceptual Design	What else do you want us to know?
<ul style="list-style-type: none">• Finalize goals and evaluation criteria• Develop draft alternatives• Review, refine, and evaluate alternatives	<p>Do you currently visit the area? How do you get there? Where do you go? What do you love about it? What is missing? Write your thoughts on a sticky note and post below.</p> <div style="border: 1px solid black; height: 200px; width: 100%;"></div>
	<p><small>creating connections / restoring a legacy</small></p>

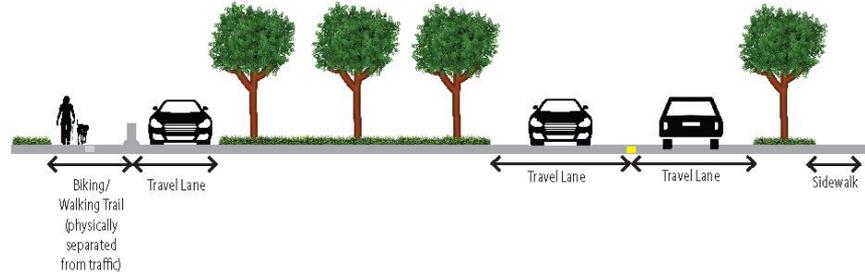
- We love walking to this bridge but the trails/access need improvement

Appendix D: Dismissed Alternatives

Alternatives considered but dismissed

- Comm Ave “over-engineered”

Trail with physical separation
from traffic



Treatment: Boardwalk N1 and S2

A boardwalk could connect under Commonwealth Avenue (lower left), just as the boardwalk in Somerville (lower right) connects under the busy Fellsway.

Politically infeasible



Intersections: Bourne Street & Phillips Street

Recommendations

- Raise intersection OR
- Neighborhood traffic circle

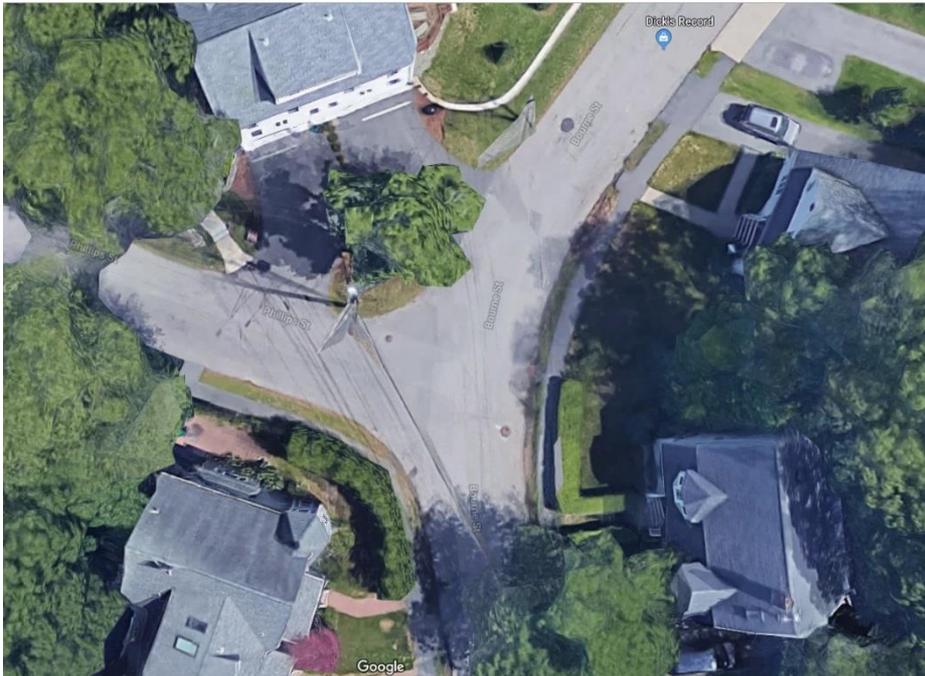


Figure 4.17 Raised Intersection

A raised intersection elevates the entire intersection footprint to sidewalk level (see **Section 4.3.1** for details).

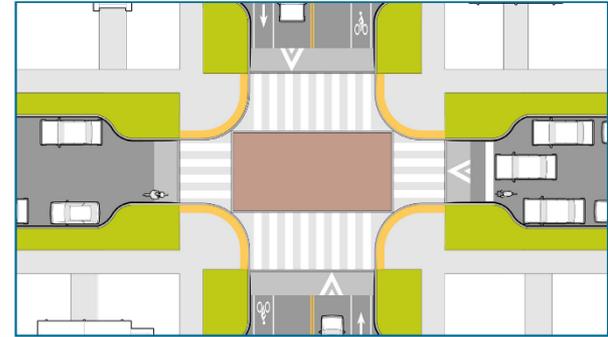
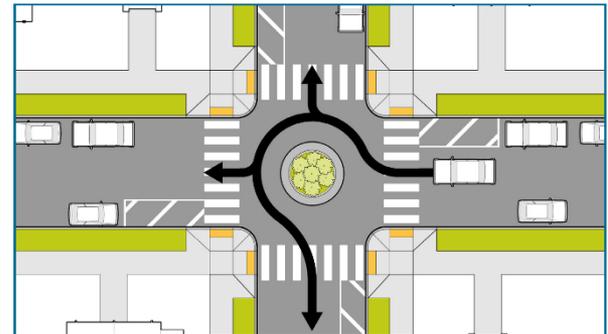


Figure 4.12 Neighborhood Traffic Circle

A neighborhood traffic circle is a raised island within an unsignalized intersection.



Intersections: Charles Street & Riverside Road



Recommendations

- Raise intersection

OR

- Install neighborhood traffic circle with raised crossings

Alignments north of Comm Ave and connections east of Riverside MBTA

Beyond scope

Auburn Street intersections

Over-engineered at this point in time, but if traffic calming is deemed necessary, could explore further

- Evergreen Avenue, Charles Street, Bourne Street
- Raise intersection or install neighborhood traffic circle

<p><i>Vision: Link communities and bring people together to share in a common natural resource.</i></p>	<p>TOTAL (max possible points = 80)</p>
<p>Depot Tunnel</p>	<p>73</p>
<p>Cross Section 2: no vehicles on carriage road between Woodbine Street and Auburn Street</p>	<p>69</p>
<p>I-90 Underpass</p>	<p>67</p>
<p>Depot tunnel to existing Pony Truss/new footbridge (footpath exists; scoring reflects potential bike/walk trail)</p>	<p>65</p>
<p>Charles Street Tunnel</p>	<p>65</p>
<p>Bike Boulevards on Neighborhood Streets</p>	<p>63</p>
<p>Pigeon Hill Trail (shared use path)</p>	<p>60</p>
<p>Cross Section 1: Conventional Bike Lanes</p>	<p>57</p>

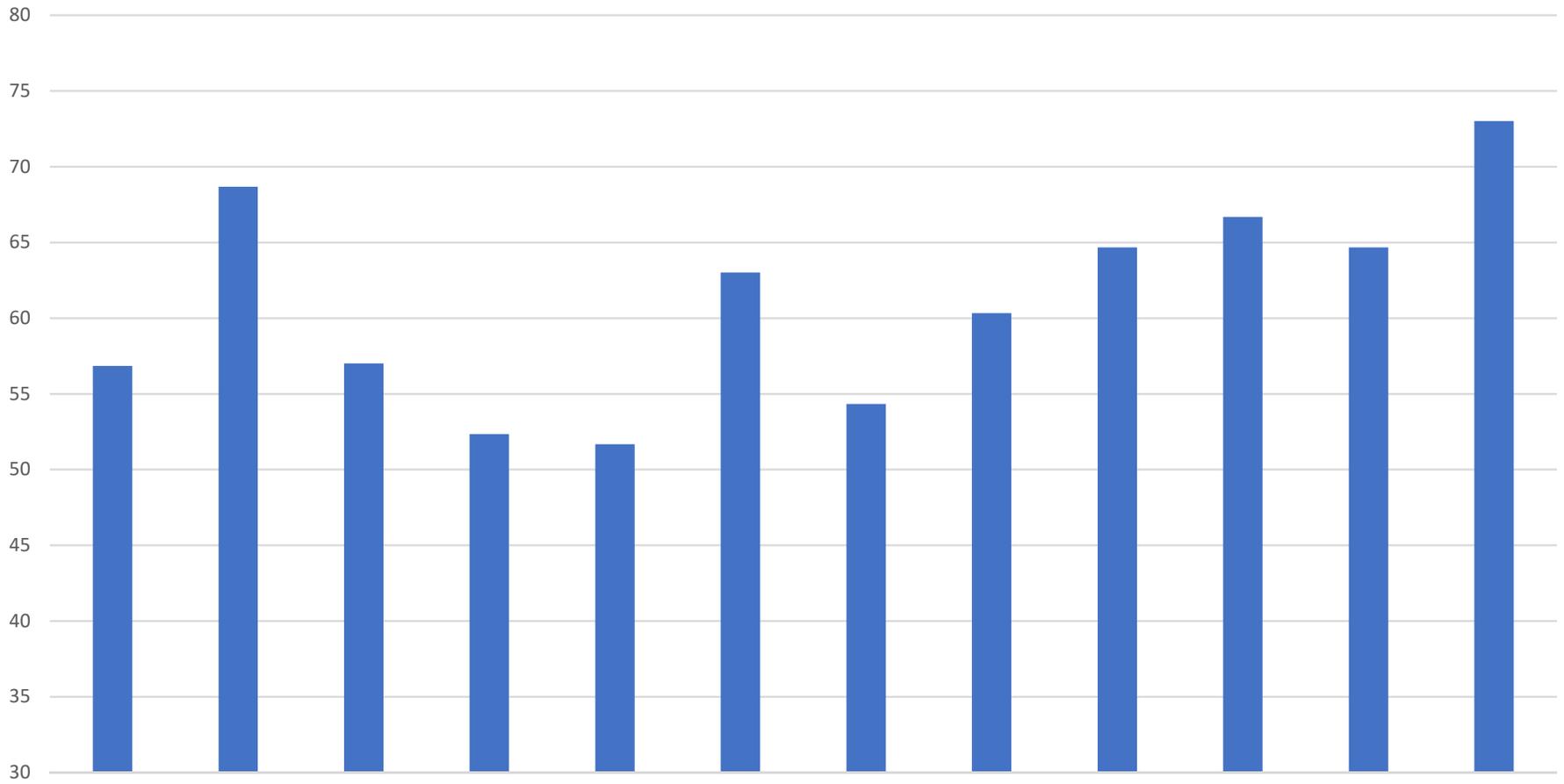
PBIC http://www.pedbikeinfo.org/cms/downloads/Countermeasure%20Costs_Report_Nov2013.pdf
 Dill https://activelivingresearch.org/sites/default/files/Dill_Bicycle_Facility_Cost_June2013.pdf
 People for Bikes <https://peopleforbikes.org/blog/protected-bike-lanes-do-not-cost-1-million-per-mile/>

Off Road	SAY	Source is PBIC unless otherwise noted
Shared Use Path (paved)	\$261,000 per mile	page 25
Path/trail (unpaved)	\$84,000 per mile	page 25
Boardwalk	\$2,000,000 per mile	page 25
On Street		
Bike Boulevard	\$100,000 per mile	Dill page i and 33 = \$50k to \$143k PBIC page 12 (\$200k is low end)
Bicycle Lane (conventional)	\$50,000 per mile	Dill page 6 is \$32k per mile PBIC page 13 is \$89,500
Separated Bicycle Lane	\$445,000 per mile	People for Bikes Dill page 6 is \$132k for one-way at grade and \$1M for two-way raised with SW
Shared Use/Side Path	\$261,000 per mile	page 25
Sidewalk (assume concrete & curb. 5' wide)	\$170 LF	page 25
	\$897,600.00 per mile	
Intersections/Crossings		
Roundabout/traffic circle	\$27,000 each	page 17
Raised crossing	\$7,000 each	page 16
Island	\$10,500 each	page 15
Pedestrian signals	\$5,240 per crossing	page 27-28
Marked crossing + curb ramps	\$5,124 per crossing	page 20, 25
Curb extension	\$13,000 each	Page 15
Signal timing adjustments	\$5,000 each	https://www.itscosts.its.dot.gov/its/benecost.nsf/0/215F723DB93D293C8525725F00786FD8
Road Diet	\$50,000 per mile	https://safety.fhwa.dot.gov/road_diets/resources/fhwasa16100/

Vision: Link communities and bring people together to share in a common natural resource.

		Goals (1 = doesn't meet goal, 5 = definitely meets goal)					Safety (1 = not at all, 5 = definitely)	Connectivity (1 = not at all, 5 = definitely)	Overcoming Barriers (1 = not at all, 5 = definitely)	Transportation (1 = not at all, 5 = definitely)	Impacts and Anticipated Permitting Needs (1 = large impacts, 5 = no impacts)				Feasibility and Timeliness (1 = less feasible, 5 = more feasible)			TOTAL (max possible points = 80)
		Does this connection improve access to the river and/or greenway for people walking, biking, or taking part in other activities?	Does this connection improve circulation and open space connections along the river corridor?	Does this connection protect and enhance the character of open space and the shoreline along the River?	Does this connection protect and improve visual/scenic quality?	Does this design/facility type limit potential conflicts between activities?	Does the facility improve safety for people walking or biking? (compared to parallel alignments)	Does it connect other networks and/or destinations (or is it a road to nowhere)?	Does it overcome one of the study area barriers (such as Comm Ave, I-90, MBTA tracks)?	Does it improve connectivity to transit?	Natural Resource Impacts	Cultural Resource Impacts	Built Environment Impacts	Wetland/Water Resource Impacts	Order of Magnitude Cost (correlates to Design Challenges)	Timeframe	Political Viability	
Commonwealth Avenue																		
Cross Section 1: vehicles allowed on carriage road for entire length of study area	Includes road diet and intersection improvements	3	3	3	3	2	4	5	4	4	5	5	3	5	3	2	4	57
Cross Section 2: no vehicles on carriage road between Woodbine Street and Auburn Street		5	5	4	4	5	5	5	4	4	5	5	3	5	3	2	4	69
Auburn Street																		
Cross Section 1: Conventional Bike Lanes	Includes intersection improvements	3	2	1	2	5	4	3	2	3	5	5	4	5	5	5	3	57
Cross Section 2: Two-way Separated Bike Lane		4	2	1	2	5	5	3	2	3	5	5	2	5	3	2	3	52
Cross Section 3: Shared Use Path		4	2	1	2	3	5	3	2	3	5	5	2	5	3	2	4	52
Neighborhood Streets																		
Bike Boulevards on Neighborhood Streets		4	4	2	2	4	3	3	3	3	5	5	5	5	5	5	5	63
Off-road Segments																		
West Pigeon Hill Footpath (from Comm Ave to I-90 Underpass)		4	3	3	3	5	4	3	2	2	3	5	5	4	3	2	3	54
Pigeon Hill Trail (shared use path)		5	5	3	4	3	4	3	2	2	4	5	5	4	4	3	4	60
Depot tunnel to existing Pony Truss/new footbridge (footpath exists; scoring reflects potential bike/walk trail)		5	5	4	4	3	4	4	2	4	3	5	5	4	4	4	5	65

Chart Title



Cross Section 1: vehicles allowed on carriage road for entire length of study area

Cross Section 2: no vehicles on carriage road between Woodbine Street and Auburn Street

Cross Section 1: Conventional Bike Lanes

Cross Section 2: Two-way Separated Bike Lane

Cross Section 3: Shared Use Path

Bike Boulevards on Neighborhood Streets

West Pigeon Hill Footpath (from Comm Ave to I-90 Underpass)

Pigeon Hill Trail (shared use path)

Depot tunnel to existing Pony Truss/new footbridge (footpath exists; scoring reflects potential bike/walk trail)

I-90 Underpass

Charles Street Tunnel

Depot Tunnel

Shared Used Path Design Guide

Cost Estimator



PROJECT COST SUMMARY

Project Name: Old Pigeon Hill Road Path
Project Location: Newton

PROJECT CATEGORY	ESTIMATED PRICE				
<u>Path</u> Length: 700 ft Width: 14 ft # Segments: 1 # Intersections: 0	\$60,000.00				
<u>Structures</u>	\$12,800.00				
<u>Landscaping Restoration & Enhancements</u>	\$22,200.00				
<u>Lighting & Security</u>	\$152,800.00				
CONSTRUCTION COST					
<u>Traffic Control</u> <i>Traffic cost not included</i>	TTCP COST \$0.00				
	SUBTOTAL \$247,800.00				
	<i>Contingency (assume 15%)</i> <u>\$37,170.00</u>				
	CONSTRUCTION COST \$284,970.00 **				
<u>Cost Escalation</u> Construction Year: 2020 <i>Assumed 4.47% increase in costs per year</i>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>CONSTRUCTION TOTAL</td> <td style="text-align: right;"><u>\$297,710.00</u></td> </tr> <tr> <td>COST PER MILE</td> <td style="text-align: right;"><u>\$2,245,580.00</u></td> </tr> </table>	CONSTRUCTION TOTAL	<u>\$297,710.00</u>	COST PER MILE	<u>\$2,245,580.00</u>
CONSTRUCTION TOTAL	<u>\$297,710.00</u>				
COST PER MILE	<u>\$2,245,580.00</u>				
<i>**Use this estimated cost on PIF forms - escalation is already included on the MassDOT Website</i>					
NON-CONSTRUCTION COSTS (NOT ESCALATED)					
<u>Survey</u> <i>Based on existing conditons</i>	SURVEY COST \$8,900.00				
<u>Design</u> <i>Assume 6% of construction cost</i>	DESIGN COST \$16,016.00				
	PROJECT TOTAL <u>\$322,626.00</u>				

[Click to Generate Error/Informational Warning Report](#)

- Costs for ROW and permitting are not included in this estimate.
- Environmental mitigation from paving a parking lot may be required. Cost not included.
- Your project includes culverts and/or bridges. Please consult a structural engineer for more accurate costs.

Shared Used Path Design Guide

Cost Estimator



PROJECT COST SUMMARY

Project Name: West Pigeon Hill Path
Project Location: Newton

PROJECT CATEGORY	ESTIMATED PRICE
-------------------------	------------------------

<u>Path</u>	Length: 1,500 ft	Width: 8 ft	\$25,200.00
	# Segments: 1	# Intersections: 0	
<u>Structures</u>			\$4,800.00
<u>Landscaping Restoration & Enhancements</u>			\$74,600.00
<u>Lighting & Security</u>			\$0.00

CONSTRUCTION COST

<u>Traffic Control</u>	Assume 4% of construction cost	TTCP COST	\$1,010.00
		SUBTOTAL	\$105,610.00
		Contingency (assume 15%)	\$15,841.50
		CONSTRUCTION COST	\$121,451.50
<u>Cost Escalation</u>	Construction Year: 2025	CONSTRUCTION TOTAL	<u>\$157,890.00</u>
	Assumed 4.47% increase in costs per year	COST PER MILE	<u>\$555,770.00</u>

**Use this estimated cost on PIF forms - escalation is already included on the MassDOT Website

NON-CONSTRUCTION COSTS (NOT ESCALATED)

<u>Survey</u>	Based on existing conditons	SURVEY COST	\$24,500.00
<u>Design</u>	Assume 5% of construction cost	DESIGN COST	\$6,600.00
PROJECT TOTAL			<u>\$188,990.00</u>

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- Costs for ROW and permitting are not included in this estimate.
- Environmental mitigation from paving a parking lot may be required. Cost not included.
- Your project includes culverts and/or bridges. Please consult a structural engineer for more accurate costs.