TWO FEASIBILITY STUDIES OF REGIONAL TRAIL LINKAGE TO THE COMMUNITY PATH EXTENSION (CPX)

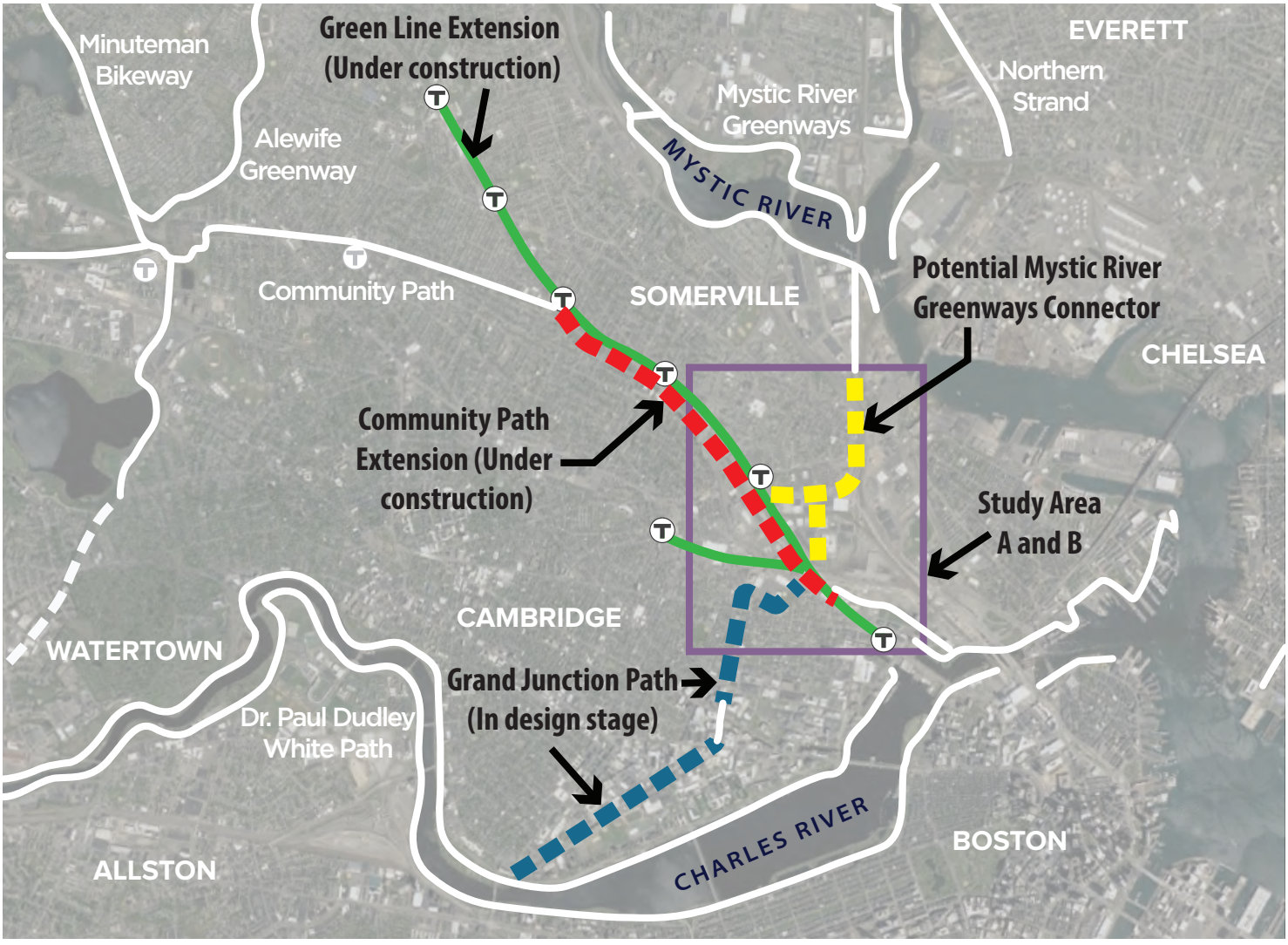
FEASIBILITY STUDY A:

COMMUNITY PATH EXTENSION: CONNECTION TO THE GRAND JUNCTION PATH

FEASIBILITY STUDY B:

COMMUNITY PATH EXTENSION: CONNECTION TO THE MYSTIC RIVER GREENWAYS AT ASSEMBLY SQUARE

JUNE 1, 2020



ACKNOWLEDGMENTS

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Friends of the **Mystic to Charles**

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01. EXISTING CONDITIONS

1.1 Context

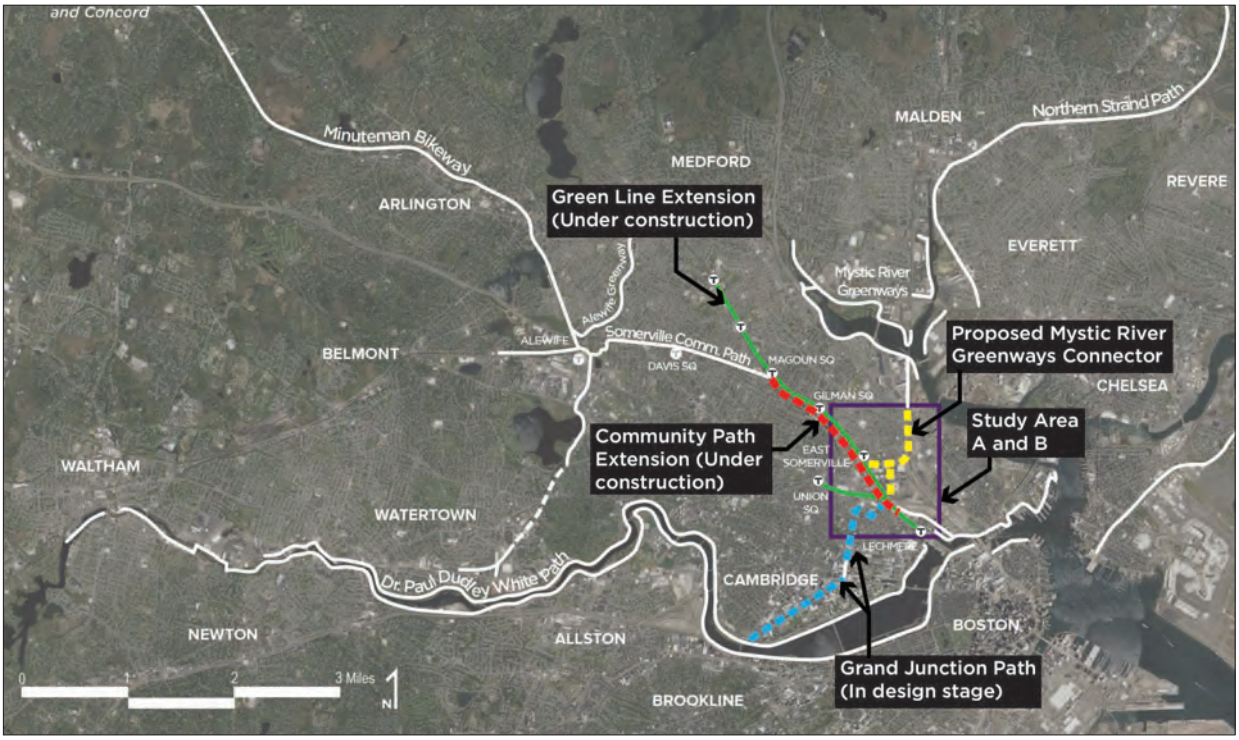
The purpose of this study is to examine the feasibility of comfortable pedestrian and bicycle connections between the Mystic River Greenways (MRG), the Community Path Extension (CPX) adjacent to the under-construction MBTA Green Line Extension (GLX), and the planned Grand Junction Path (GJP) system.

The Study Area boundaries, shown in purple below, include:

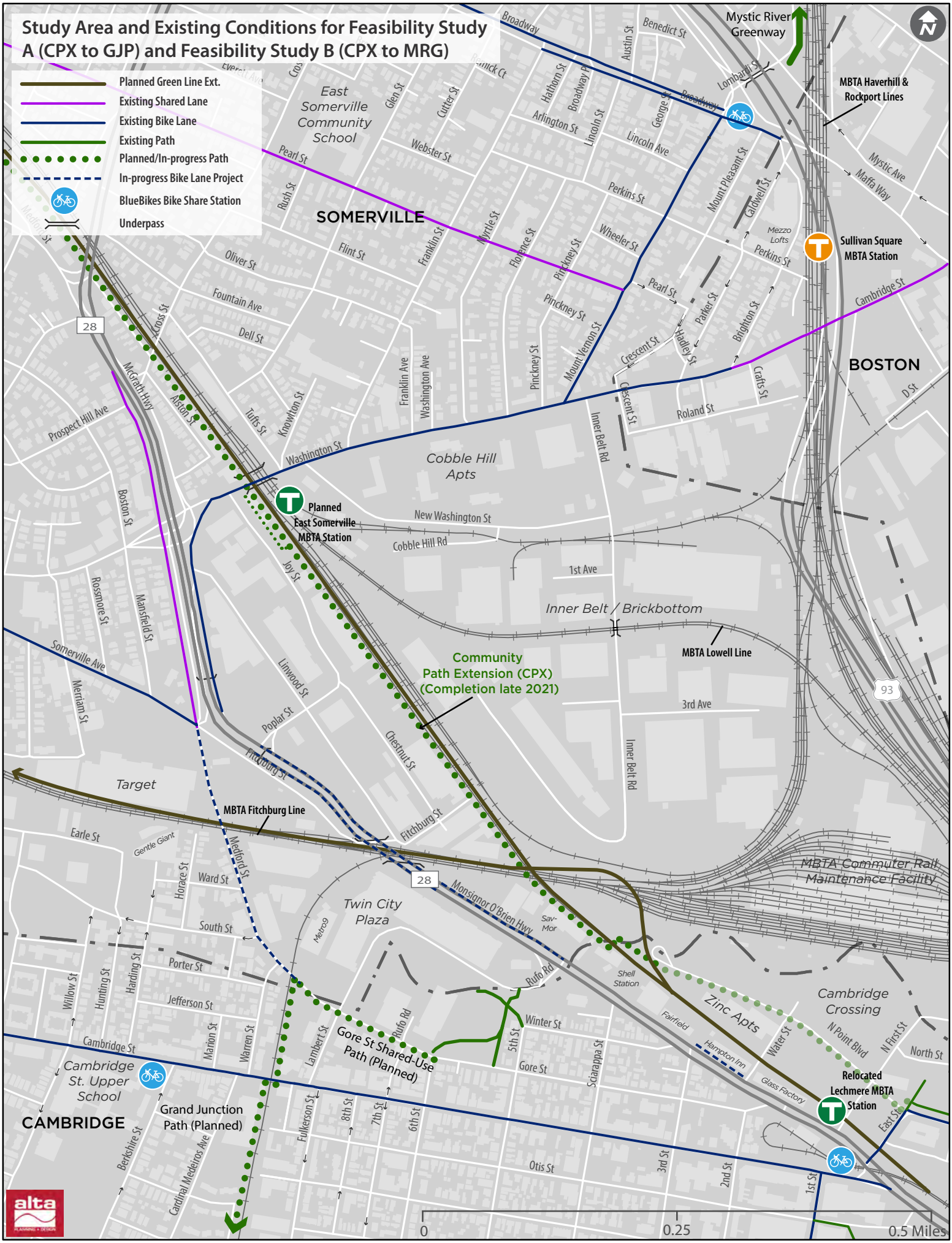
- The southern terminus of the existing Mystic Greenway at the intersection of Grand Union Boulevard and Mystic Avenue (Route 38)
- North First Street at the intersection with the relocated Lechmere Green Line MBTA Station to the east
- The planned Grand Junction Path crossing at Medford / Gore Street to the south
- And the MA28 / McGrath Highway bridge over the MBTA GLX and Commuter Rail tracks at Chester Avenue to the west.

Once completed, the CPX (under construction) and GJP (in design) will come close, but not connect, to each other. The Study Area described above has the potential to form the nexus of multiple shared use paths. If links between the CPX, the GJP and the MRG can be established, it would provide critical connections between dozens of miles of shared use paths throughout the region.

If the CPX and GJP can be linked by an off-road path connection, commuters and recreational users traveling via Somerville and East Cambridge would have seamless access to job hubs such as Kendall Square and Lechmere, as well as the entire Charles River Basin trail system. Furthermore, if the MRG were linked to the CPX, a commuter living adjacent to any of the burgeoning area path systems could bicycle to numerous employment centers without ever riding adjacent to heavy automobile traffic. Lastly, this Mystic-CommPath link would allow travelers on the 104-mile Mass Central Rail Trail (https://www.masscentralrailtrail.org) to continue northeast on the Border to Boston trail (https://essexheritage.org/bordertoboston), a segment of the East Coast Greenway (https://www.greenway.org).



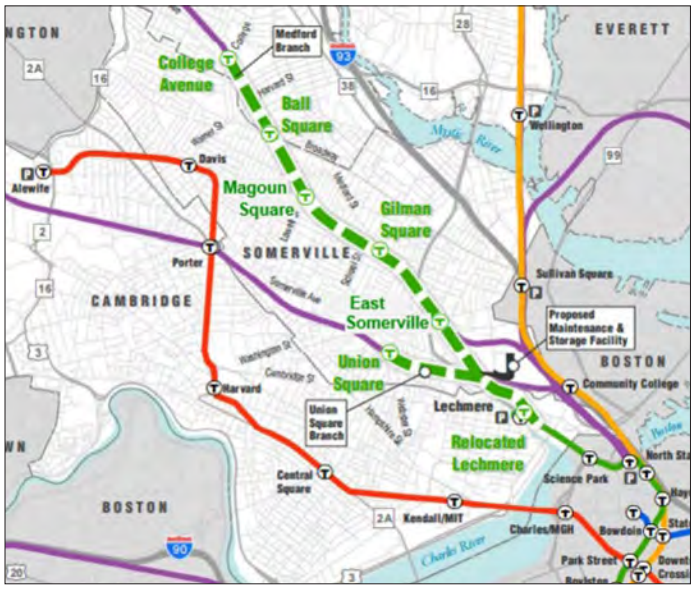
The Study Area (outlined by purple box in map at right) includes portions of Somerville, Boston, and Cambridge


Study Area and Existing Conditions for Feasibility Study
A (CPX to GJP) and Feasibility Study B (CPX to MRG)
Planned Green Line Ext.
Existing Shared Lane
Existing Bike Lane
Existing Path
Planned/In-progress Path
In-progress Bike Lane Project
BlueBikes Bike Share Station
Underpass
SOMERVILLE
BOSTON
CAMBRIDGE
East Somerville Community School
Cobble Hill Apts
Inner Belt / Brickbottom
Twin City Plaza
Target
Zinc Apts
Cambridge Crossing
Cambridge St. Upper School
MBTA Commuter Rail Maintenance Facility
Community Path Extension (CPX) (Completion late 2021)
Planned East Somerville MBTA Station
Sullivan Square MBTA Station
Relocated Lechmere MBTA Station
MBTA Haverhill & Rockport Lines
MBTA Lowell Line
MBTA Fitchburg Line
Mystic River Greenway
Gore St Shared-Use Path (Planned)
Grand Junction Path (Planned)
Broadway
Washington St
New Washington St
Cobble Hill Rd
Somerville Ave
Fitchburg St
Monsignor O'Brien Hwy
Cambridge St
Inner Belt Rd
Lechmere Canal Park
0
0.25
0.5 Miles

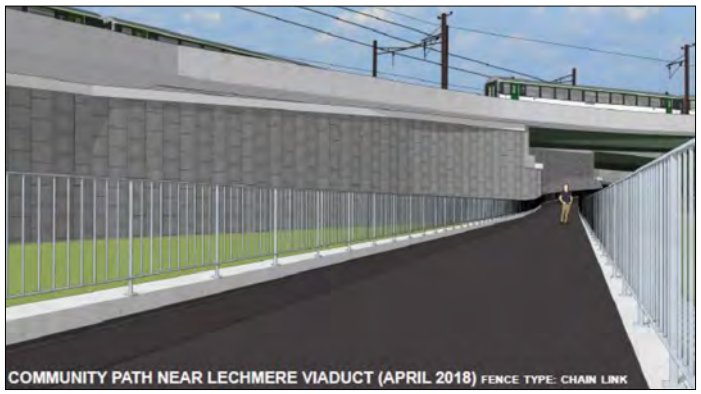
1.2 Ongoing Development + Past Plans / Studies

GREEN LINE EXTENSION / COMMUNITY PATH EXTENSION (EXPECTED COMPLETION 2021)

As a result of the Boston Central Artery / Big Dig project, MassDOT/MBTA are working together to expand light rail transit service to Union Square in Somerville and College Avenue near the Tufts University campus in Medford. The GLX includes the design-build of seven new Green Line stations on two lines and a multi-use Community Path Extension within the rail right-of-way from Lowell Street in Somerville to the Cambridge Crossing development at Lechmere Station. Currently 20% of Somerville population is within walking distance of rail transit today, and 80% is expected to be within walking distance when the GLX and Community Path Extension is completed.

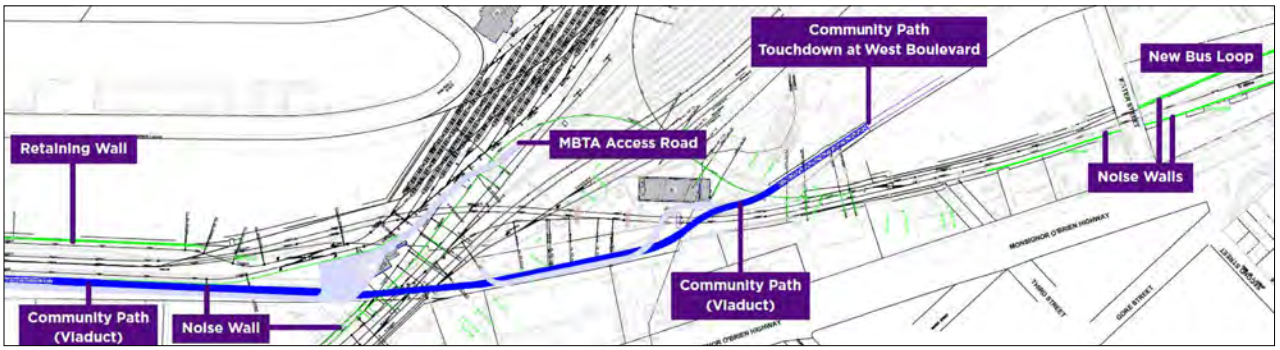


The green line extension routes to Union Sq and College Ave



A rendering of the CPX included in the GLX Roll Plan

The GLX roll plan document indicates that the 2.2 mile Community Path Extension in this area will be partially at-grade and partially built on an elevated viaduct. The CPX viaduct is slated to touch down at the planned West Boulevard area at Cambridge Crossing development where paths will continue on to the Charles River, by the North Bank Bridge. The elevated CPX viaduct is required due to the planned crossing of the Fitchburg Commuter Rail tracks.



The raised viaduct portion of the Community Path Extension crosses the Fitchburg Commuter Rail line Plan

Planned CPX access points in the study area include on the west side of Cross Street at Chester Avenue in Somerville and at the planned East Somerville MBTA station. The 2011 GLX environmental assessment report predicts 6,975 daily walk trips and 440 daily bike trips to the new Lechmere station.

TIGER GRANT APPLICATION (2010)

The TIGER II application for federal funding to aid the construction of the Community Path Extension along the MBTA Green Line Extension was submitted in August 2010 by the Mayor's Office of Strategic Planning and Community Development. The City did not win this grant funding. The CPX is being funded as part of the GLX project. The grant application outlines the benefits of extending the Community Path as well as the cost-benefit analysis.

Benefits of extending the Community Path include a variety of elements related to Economic Competitiveness:

- Promoting a long-term growth in productivity and lessening dependency on vehicles and fuel; reducing congestion, increasing property values; creating opportunities for transit-oriented development; fostering bicycle-related business; and increasing efficiencies associate with a multimodal use of transportation infrastructure

Cost-benefit analysis information resulted in the following benefits from increased recreation, mobility, and health and decreased automobile use:

- Net annual economic benefits of the CPX as a bicycle facility are estimated at $8.6 million (low), $52.5 million (middle), and $79.1 million (high estimate.)

Additional projected livability benefits include:

- Reduced greenhouse gases and improve air quality; create opportunity for decreased household transportation costs
- Improved access for economically disadvantaged populations, non-drivers, seniors, and persons with disabilities
- Improved public health and reduce childhood obesity

Notably, the conclusion section of the grant application describes the impact that various modes of transportation have on Somerville's landscape: "... freight and commuter lines crisscross our neighborhoods and a massive maintenance facility (The Boston Engine Terminal - BET) dominates our largest economic development district. All of these factors contribute to making travel across Somerville hazardous, significantly increasing our levels of air pollution, and severely inhibiting commercial development within our 160-acre Inner Belt/Brickbottom District." - pg. 24.

METROPOLITAN AREA PLANNING COUNCIL - THE COMMUNITY PATH EXTENSION - DATA METRICS AND TALKING POINTS (2013)

The Massachusetts Area Planning Council (MAPC) released a report in 2013 titled The Community Path Extension - Data Metrics and Talking Points. The report includes a map indicating the proposed CPX. The report indicates the desire to connect to existing regional paths, including:

- Somerville Community Path (1.9 miles)
- The Minuteman Path (10 miles)
- Dr. Paul Dudley White Path (23.1 miles)
- Fitchburg Cut-Off Trail (0.8 miles)
- Narrow Gauge Trail (3.8 miles)
- Reformatory branch trail (3.8 miles)

- Alewife Brook Pathways (3.1 miles)

The extension of the Somerville Community Path to other regional paths would fill in part of a the critical missing connection to connect ~48 miles of paths.

The report includes regional trail user counts, demographic information, as well as forecasts the likely impact on MBTA Green Line ridership. The report predicts that many path users would utilize the new path to travel further into Boston and other destinations with the addition of a safer facility for pedestrians, bicyclists and transit users.

The demographic information underscores the importance of completing the gap in the trail system:

- 131,800 employees work in over 8,900 businesses within one mile of the completed CPX (2011 InfoGroup Employment Data)
- 180,900 people live within one mile of the completed CPX (2011 InfoGroup Employment Data)
- 31% of resident commuters within a half mile of the completed CPX use transit to commute to work
- 24% of households within a half mile of the completed CPX do not have access to a car

Finally, the report also utilized a regional travel demand model indicating a sharp rise in future walking and bicycling trips due to the new connection. It is estimated to generate approximately 3.1 million annual[1] path trips -- making this one of the most used rail-with-trail in the country.

The report highlights the opportunity to link future development to the CPX: the City of Somerville indicated that there are 104 acres of underutilized land within a half-mile of the completed CPX and ~7-10 million square feet of potential redevelopment space accessible to the CPX.

The report also discusses benefits to Environmental Justice populations, reductions in single-occupant vehicle trips, improvements in air quality, and an increase in the amount of open space.

GRAND JUNCTION SHARED USE PATH (2015)

March 2015 Presentation and Next Steps (2015)

A March 2015 presentation by the Cambridge City Council, Transportation and Public Utilities Committee provides an overview of the Grand Junction Path, local connections, typical path segment graphics, and a timeline of important milestones.

Additional elements of that presentation include information about recent coordination with the Green Line Extension (GLX) team, Friends of the Community Path, Friends of the Grand Junction Path, municipalities, and HYM investment group (the development firm behind the Cambridge Crossing / Northpoint development). The presentation makes clear that high-level discussions about not precluding various options for connecting the Grand Junction Path to the CPX have taken place.

In the Next Steps segment of the presentation, there is a recommendation to continue to coordinate with the City of Somerville to not preclude and to provide incentives for future pedestrian and bicycle connections though current zoning update, as well as to continue to work with HYM on the possibility of designing connections from the Community Path to the Grand Junction Path into East Cambridge.

Cambridge Redevelopment Authority (CRA) - Closing The Gap Grand Junction Path Concept (2015)

In a concept study generated by CRA, LivableStreets, and Toole Design Group, there is a clear desire to connect the planned northern terminus of the Grand Junction Path to the Community Path Extension. Two alternative's are provided:

- **Alternative A**: Includes an on-road separated bike lane facility on the northeast end of Gore Street, a shared-use path through Gold Star Mothers Park, and a ramp to bring the path from the Rufo Road / McGrath Hwy intersection up to the elevated Community Path Extension.
- **Alternative B**: Includes utilizing the existing railroad right-of-way and continuing the path north of Gore Street to wrap around behind the Metro9 condo building and Twin City Plaza, continuing beneath McGrath Hwy, navigating a pinch point created by the GLX construction, and another pinchpoint by the Life Storage building, then connecting to the CPX near the rail-storage area adjacent to the engine maintenance facility.

METROPOLITAN AREA PLANNING COUNCIL - LANDLINE VISION REPORT (2018)

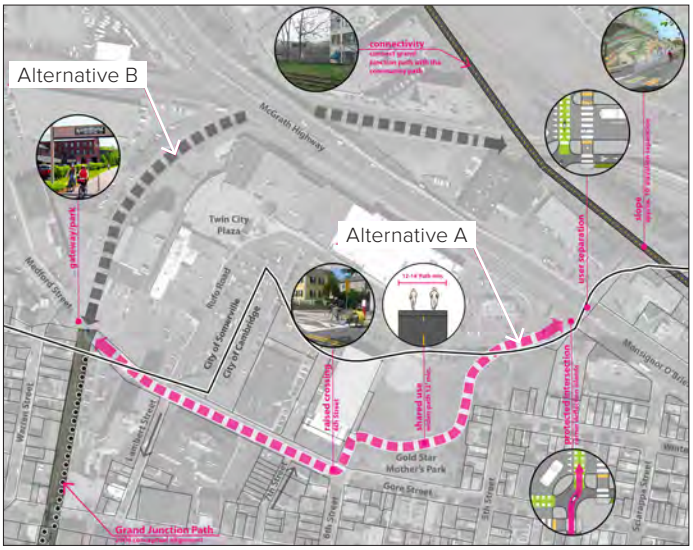
The June 2018 Landline Vision Report by the MAPC includes a visionary map of regional trail connectivity, with dark green indicating existing trails and lighter green indicating envisioned trails (see graphic at right.) The report includes a map document indicating a proposed connection from Assembly Square to the planned terminus of the Grand Junction and connecting to the Somerville Community Path extension.

MAKING THE CASE FOR THE MYSTIC CONNECTOR PATH (2018)

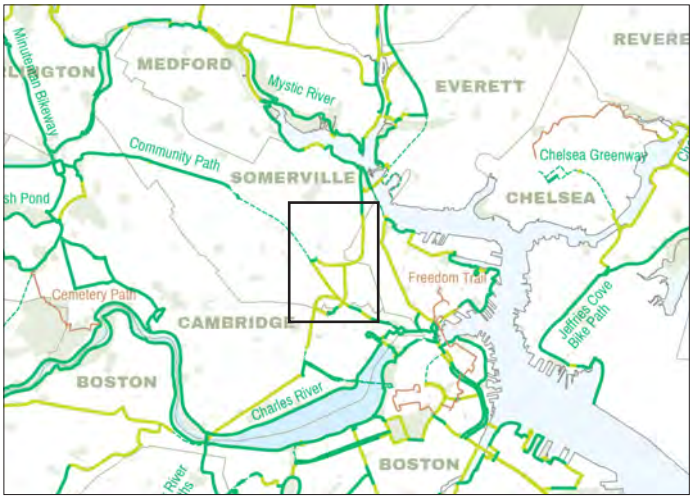
In 2018, graduate students in urban planning Liza Burkin (Tufts) and Karl Alexander (UMass Boston) examined the opportunity to route the proposed Mystic Connector along an existing rail right-of-way adjacent to the active MBTA Orange Line and through the Inner Belt / Brickbottom area.

The report recommends the path run within the existing rail corridor on the west side of the active Orange Line tracks from

A snip of the map from the Closing The Gap - Grand Junction Path report includes "study area-3" between the GJP at Gore Street to the CPX behind McGrath Highway near the intersection of Rufo Road



A snip of a map from the Closing The Gap - Grand Junction Path 2015 report includes Alternative Alignments A and B, described at left



The 2018 MAPC Vision report included a map indicating the need for connecting the Mystic River Greenway, the Community Path Extension, and the Grand Junction Path (black box added for location emphasis)

Assembly Station south to Inner Belt Road in Somerville, turning west just south of Sullivan Square Station. This dead-end rail corridor studied was infrequently utilized, but has been improved in 2020 to store freight rail cars on the dead-end tracks. The report recommends the path replace one of the existing tracks in the rail envelope.

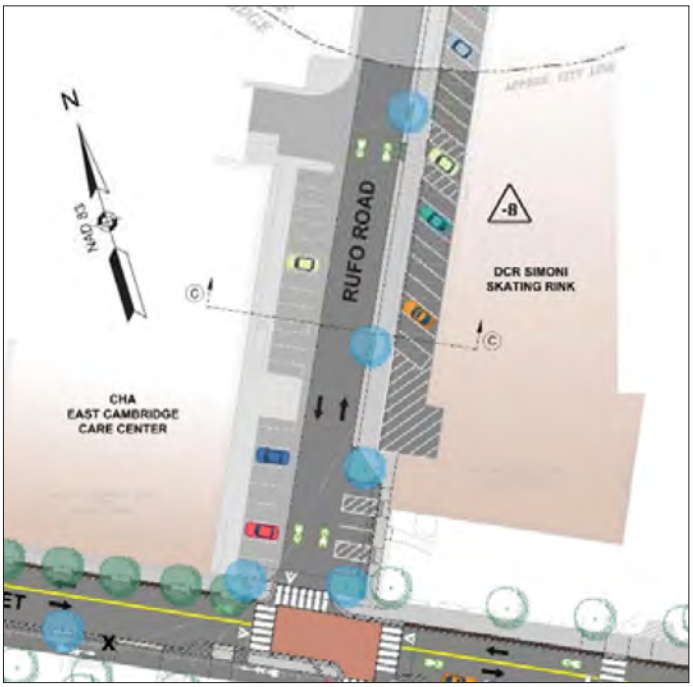
The authors of the report write that the tracks become active again on the western side of Inner Belt Road. Because the Green Line extension resulted in a loss of storage and turn-around space, Pan Am Railways has plans to use the tracks west of Inner Belt Road for that purpose under an agreement with the MBTA. New tracks were laid in this location in 2018, likely preventing a shared-use path option within the rail bed right-of-way. The recommendations in the report transition to on-street bicycle and pedestrian facilities on Inner Belt Road and New Washington Street.

GORE STREET AND RUFO ROAD SURFACE RECONFIGURATION (2018)

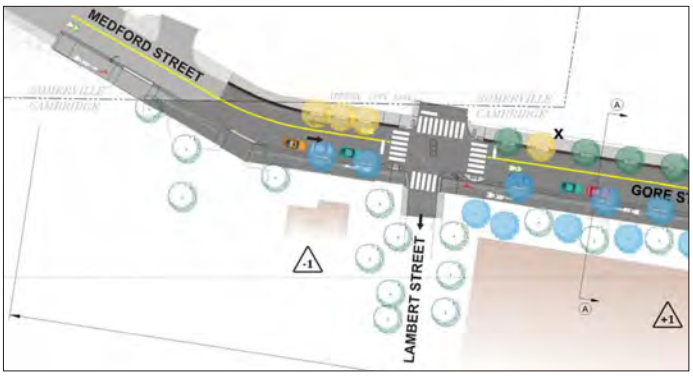
At an early May 2018 public meeting, the City of Cambridge Department of Public Works provided an update on the Gore Street and Rufo Road design. The city's presentation included information on Vision Zero and Complete Streets designs. "Our approach emphasizes streets designed and operated for everyone. Pedestrians, bicyclists, motorists, and transit users of all ages and abilities will be able to safely move along and across Complete Streets." A variety of work at and below the road surface is taking place as part of this reconstruction effort:

- New water main and replacement of lead services
- Sewer main rehabilitation and repairs
- Pavement profile restoration and repaving
- Accessible sidewalk reconstruction that includes a 10'-0" wide, two-way shared-use path

A plan view diagram from the 2018 Making The Case report shows the shared-use path transition from the railroad right-of-way to on-street bicycle infrastructure at the intersection of Inner Belt Road at New Washington Street and the dog park



This plan view diagram shows the sidewalk and angled parking adjacent to Simoni Rink as proposed by the City of Cambridge in May, 2019.



This plan view diagram shows the multi-use path along the south side of Gore Street extending from about 50'-0" into the City of Somerville to Sixth Street, as proposed by City of Cambridge in May 2019

- Tree plantings and improved drainage

Construction is expected to commence in 2020. Construction may be delayed due to construction activity being shutdown in response to the COVID-19 situation.

NOTE: In the same period, the City of Somerville plans to add striped bike lanes and flexible delineator posts to Medford Street between Somerville Ave and the Cambridge City line near Warren Street at Medford Street. Cambridge and Somerville have committed to working out a design for the transition at the City line.

A rendering of the proposed changes to Gore Street from the City of Cambridge public meeting / presentation in spring 2019

CAMBRIDGE CROSSING (2019)

Cambridge Crossing is a 45-acre mixed use transit-oriented development in East Cambridge. The buildings and open space will be located near the under-construction relocated Lechmere MBTA station. The development proposes 4.5 million square feet of planned commercial, retail, and residential space, with 11 acres of public and green spaces. The development will have a profound impact on the demand for a variety of transportation options -- especially walking and bicycling -- in Somerville, Cambridge, Boston, and many nearby communities. The CPX connects to the paths within Cambridge Crossing that further connect to North Point Park, the Charles River and Charlestown.

According to the Cambridge Crossing website, protected bike lanes and footpaths are planned within the area.

A rendering of Cambridge Commons from promotional materials

1.3 Existing Conditions Analysis

Within the first two months of the project kick-off, members of the project team (Alta Planning + Design, the Friends of the Community Path and Friends of Mystic-to-Charles Connector) met with a variety of stakeholders to conduct critical interviews to understand path connections and other developments in the Study Area. The Friends of the Grand Junction Path was also involved in our conversations.

Members of the project team have met with the following stakeholders:

- **MassDOT**: Mike Trepannier, MassDOT
- **City of Cambridge**: Bill Deignan, Transportation Program Manager, and Andy Reker, Transportation Planner
- **City of Somerville**: Melissa Woods, Senior Planner, and Viola Augustin, Transportation Planner / GLX Project Liaison
- **MBTA / GLX Team:** Terry McCarthy, MBTA Deputy Program Manager of Stakeholder Engagement, Marty Nee, Stakeholder Engagement (City Point Partners), Declan O'Shea, Project Engineer

These stakeholder meetings provided valuable insight into planned / funded shared-use paths, sidewalk-level separated bike lanes, conventional bike lanes, and new sidewalks being designed and constructed in Cambridge and Somerville. The stakeholder meetings also furthered the project teams' understanding of the MBTA Green Line, Orange Line, Commuter Rail, and other freight needs on existing rail tracks to access existing and planned vehicle maintenance facility buildings.

FEASIBILITY STUDY AREA A: KEY CONSIDERATIONS

Grand Junction Path to Gore / Medford Street

The planned Gore / Medford Street shared-use project will extend roughly from the location where the Grand Junction tracks cross Medford Street to Sixth Street at the Somerville/Cambridge municipal border. The planned Gore Street path will be located on the south side of the street. The Gore Street project is being driven by utilities work and includes DivCo (Cambridge Crossing developers) and is being managed by City of Cambridge Public Works Department.

In addition to the planned Gore Street shared-use path project, sidewalks and shared lane markings have been introduced along Rufo Road adjacent to Simoni Rink. (**NOTE**: All proposed completion dates subject to change due to ongoing COVID-19 pandemic construction work stoppage.)

Rufo Road / McGrath Highway Intersection

The City of Cambridge advocated to MassDOT for an east-side crosswalk on McGrath at Rufo Road, but it is not planned or funded yet.

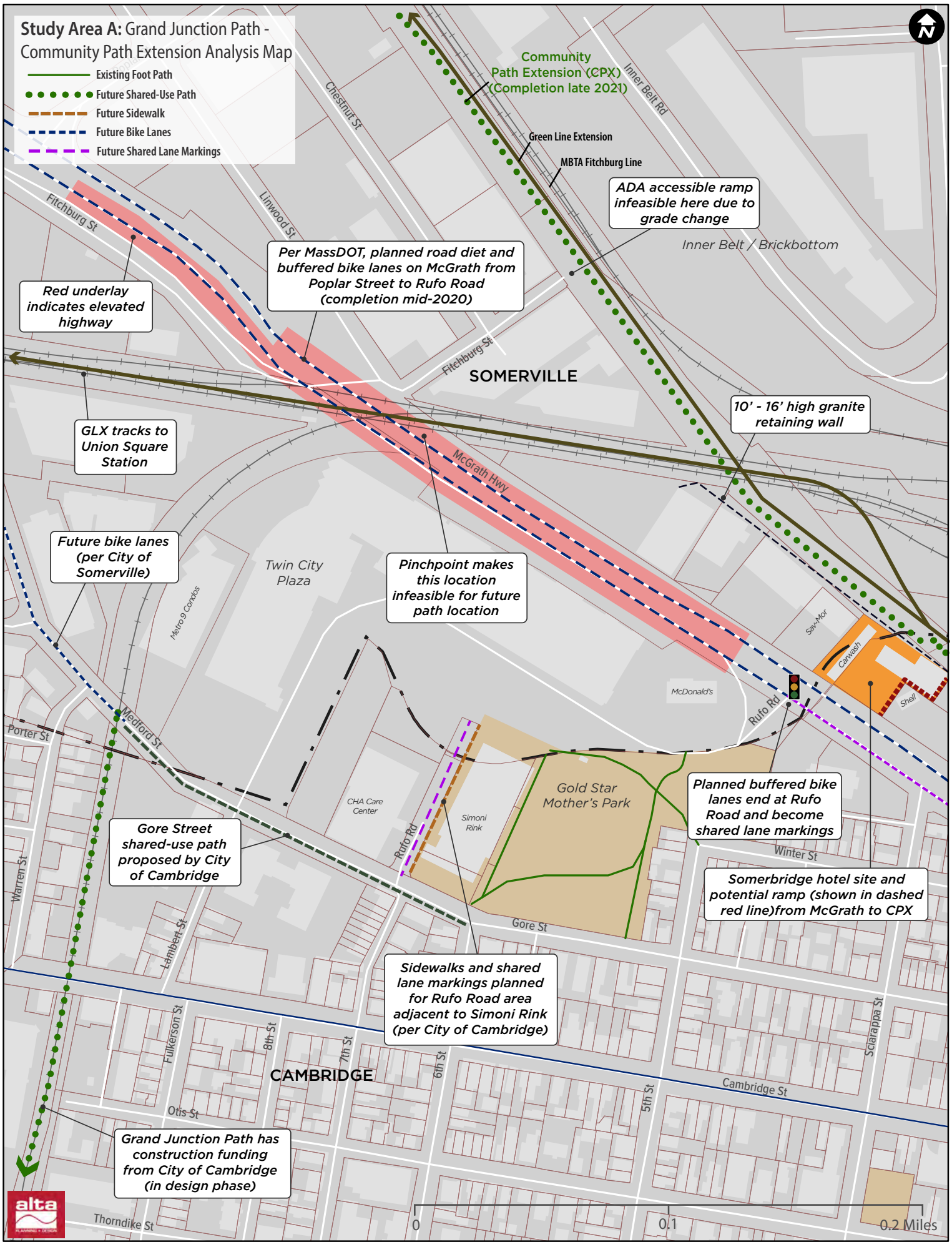
According to MassDOT, the preliminary plans for a road diet along McGrath west of Rufo Road does not include the elimination of the right-turn slip-lane onto Rufo for delivery trailer truck access to Twin City Plaza.

Somerbridge Development Area

The Somerbridge Hotel redevelopment site (currently occupied by three closed businesses: Lechmere Car Wash, Meineke Autocare Center, and Boston Tropical Fish & Reptile) has been in talks with the Friends of The Community Path and The Friends of The Grand Junction Path groups to develop a ramp connection for bicyclists and pedestrians to more easily access the under-construction Community Path Extension.

The project developers have indicated that it would be a benefit to them to build a ramp along the edge of their property from sidewalk-level to the higher GLX / CPX grade elevation at the rear of the hotel site. The proposed ramp would require the proper easements and discussions with the MBTA. At this time, the Somerbridge site developers have proposed an alignment and are working with the Friends of groups to improve the design. While the site developers are not accepting / risk / liability for the proposed ramp, they have expressed good faith intent to provide a pedestrian/bike connection through the site and intend to build it.

See the analysis map and inset diagrams on the next two pages for additional notes and analysis on the Grand Junction Path to Community Path Extension.


Study Area A: Grand Junction Path - Community Path Extension Analysis Map
Existing Foot Path
Future Shared-Use Path
Future Sidewalk
Future Bike Lanes
Future Shared Lane Markings
Community Path Extension (CPX) (Completion late 2021)
Green Line Extension
MBTA Fitchburg Line
Inner Belt Rd
Chestnut St
Linwood St
Fitchburg St
ADA accessible ramp infeasible here due to grade change
Inner Belt / Brickbottom
Per MassDOT, planned road diet and buffered bike lanes on McGrath from Poplar Street to Rufo Road (completion mid-2020)
Red underlay indicates elevated highway
SOMERVILLE
10' - 16' high granite retaining wall
GLX tracks to Union Square Station
McGrath Hwy
Future bike lanes (per City of Somerville)
Twin City Plaza
Pinchpoint makes this location infeasible for future path location
Metro 9 Condos
Sav-Mor
Carwash
Shell
McDonald's
Rufo Rd
Medford St
Porter St
Gold Star Mother's Park
Planned buffered bike lanes end at Rufo Road and become shared lane markings
CHA Care Center
Simoni Rink
Gore Street shared-use path proposed by City of Cambridge
Winter St
Somerbridge hotel site and potential ramp (shown in dashed red line)from McGrath to CPX
Warren St
Lambert St
Gore St
Sidewalks and shared lane markings planned for Rufo Road area adjacent to Simoni Rink (per City of Cambridge)
Fulkerson St
8th St
7th St
6th St
5th St
Sciarappa St
CAMBRIDGE
Cambridge St
Otis St
Grand Junction Path has construction funding from City of Cambridge (in design phase)
Thorndike St
0
0.1
0.2 Miles
alta

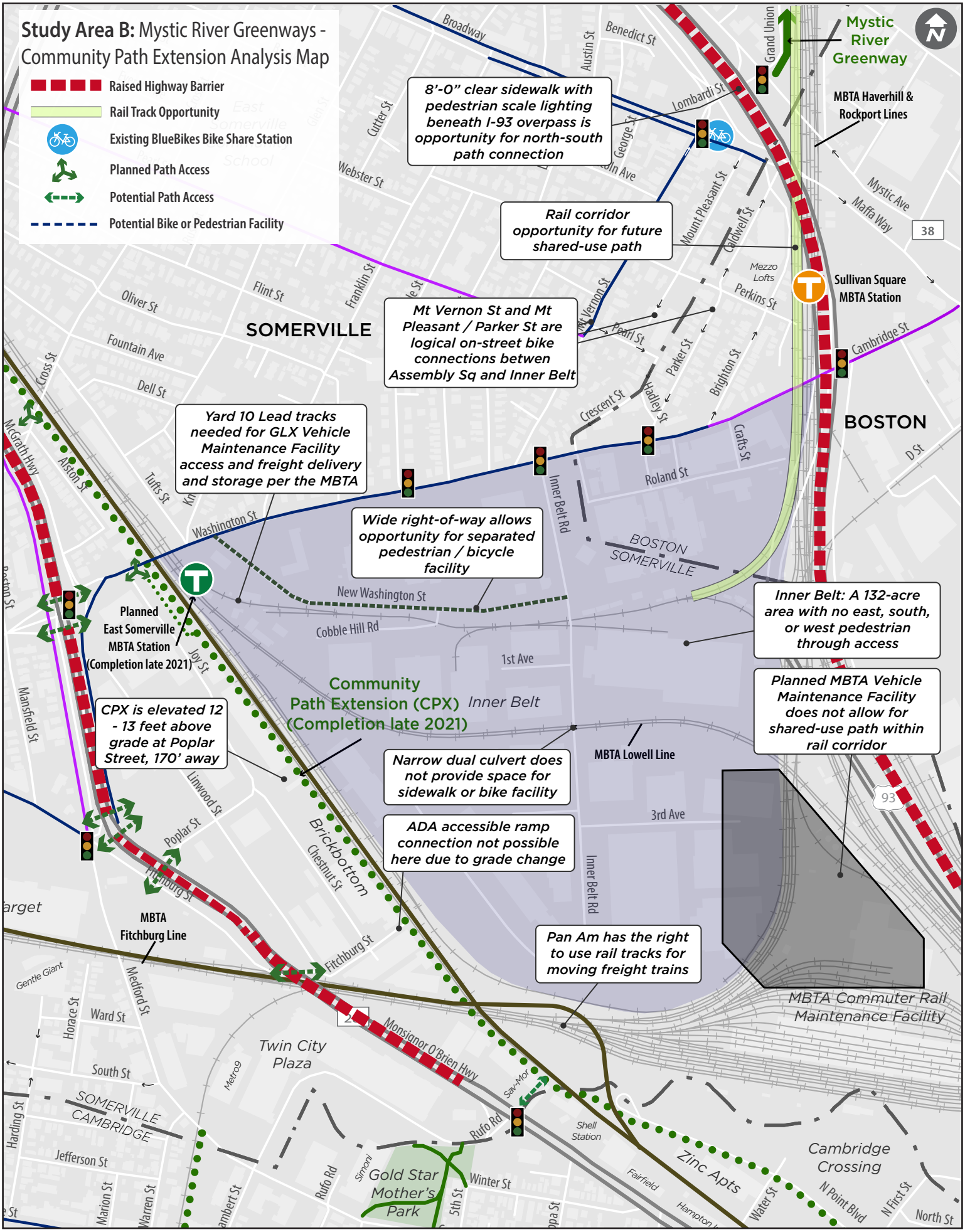
FEASIBILITY STUDY AREA B: KEY CONSIDERATIONS

See the map on the following page. Providing a trail connection between the Mystic Greenways and the Community Path Extension poses a number of considerations:

- The rail right-of-way running adjacent to the MBTA Orange Line would be an ideal connection from Assembly Square to the Inner Belt, but rail tracks used to store freight cars have recently been rebuilt by the MBTA and MassDOT.
- While some bicycle infrastructure exists in East Somerville, it does not provide a seamless link between Broadway and Washington Street.
- The Inner Belt area is completely cut off from districts to the east, south and west due to elevated highway and rail infrastructure, with few opportunities to provide ped/bike connections.
- Walking and bicycling within the Inner Belt itself is hampered by the narrow dual culverts on Inner Belt Road, below the MBTA Lowell Line.
- Significant opportunities to provide pedestrian and bicycle facilities lie on 44'-wide New Washington Street and/or along the rail right-of-way and adjacent storage area that exist east of Inner Belt Road and on the north side of the MBTA Lowell Line and north to Sullivan Square and Assembly area.

Interstate 93 passes by above Route 38 which travels over over rail tracks. The multiple layers of transportation infrastructure result in difficulty for pedestrians and bicyclists navigating to and through the neighborhood. Image looking north from Brighton Street.

New Washington Street has a wide right-of-way and is ripe for improvement incorporating pedestrian and bicycle facilities.


Study Area B: Mystic River Greenways - Community Path Extension Analysis Map
Raised Highway Barrier
Rail Track Opportunity
Existing BlueBikes Bike Share Station
Planned Path Access
Potential Path Access
Potential Bike or Pedestrian Facility
8'-0" clear sidewalk with pedestrian scale lighting beneath I-93 overpass is opportunity for north-south path connection
Rail corridor opportunity for future shared-use path
Mt Vernon St and Mt Pleasant / Parker St are logical on-street bike connections betwen Assembly Sq and Inner Belt
Yard 10 Lead tracks needed for GLX Vehicle Maintenance Facility access and freight delivery and storage per the MBTA
Wide right-of-way allows opportunity for separated pedestrian / bicycle facility
Inner Belt: A 132-acre area with no east, south, or west pedestrian through access
Planned MBTA Vehicle Maintenance Facility does not allow for shared-use path within rail corridor
CPX is elevated 12 - 13 feet above grade at Poplar Street, 170' away
Narrow dual culvert does not provide space for sidewalk or bike facility
ADA accessible ramp connection not possible here due to grade change
Pan Am has the right to use rail tracks for moving freight trains
Mystic River Greenway
MBTA Haverhill & Rockport Lines
Sullivan Square MBTA Station
Planned East Somerville MBTA Station (Completion late 2021)
Community Path Extension (CPX) (Completion late 2021)
MBTA Lowell Line
MBTA Fitchburg Line
MBTA Commuter Rail Maintenance Facility
SOMERVILLE
BOSTON
Inner Belt
Twin City Plaza
Gold Star Mother's Park
Cambridge Crossing
Zinc Apts
Broadway
Benedict St
Austin St
Grand Union
Lombardi St
Webster St
Mount Pleasant St
Caldwell St
Mystic Ave
Maffa Way
Mezzo Lofts
Perkins St
Oliver St
Flint St
Franklin St
Fountain Ave
Dell St
Cross St
McGrath Hwy
Alston St
Tufts St
Washington St
Pearl St
Parker St
Brighton St
Crescent St
Hadley St
Cambridge St
Roland St
Crafts St
Inner Belt Rd
New Washington St
Cobble Hill Rd
1st Ave
3rd Ave
Joy St
Mansfield St
Linwood St
Poplar St
Fitchburg St
Chestnut St
Brickbottom
Medford St
Ward St
Horace St
South St
Harding St
Jefferson St
Marion St
Warren St
Monsignor O'Brien Hwy
Sav-Mor
Rufo Rd
Shell Station
Winter St
5th St
Fairfield
Water St
N Point Blvd
N First St
North St
D St
38
93

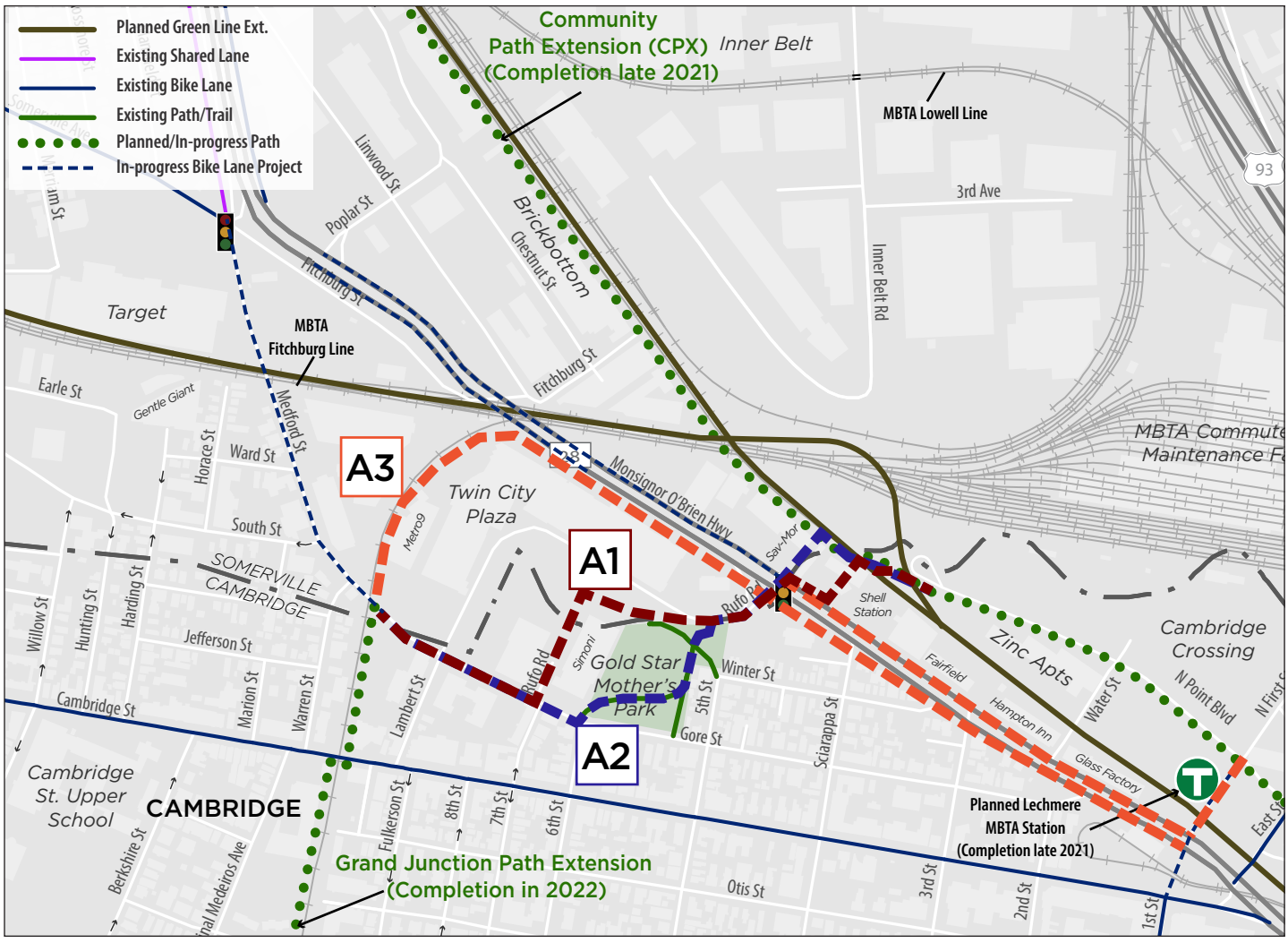
02. ROUTE ANALYSIS & ALIGNMENT OPTIONS

2.1 Study Area A: Grand Junction Path - Community Path Extension Connection

Three route options are proposed to provide connectivity between the Grand Junction Path (GJP) and the Community Path Extension (CPX). One option looks at a route that maximizes use of the Grand Junction corridor and uses separated bike lanes along Route 28 to link to the CPX. Two other options explore a route along the south edge of the Twin City Plaza parcel and connect to the CPX by using a ramp-and-path structure through private property on the north side of Monsignor O'Brien Highway/Route 28. In both cases, an improved path alignment could be possible with the eventual long-term redevelopment of Twin City plaza with a high density, mixed-use project with some open space and other amenities. Options A1 and A2 have some overlapping segments, and could be mixed-and-matched for maximum efficiency in trail construction. The following three route options were analyzed:

- A1: Rufo Road
- A2: Gold Star Mother's Park
- A3: McGrath Highway

STUDY AREA A: ROUTE OPTIONS OVERVIEW MAP



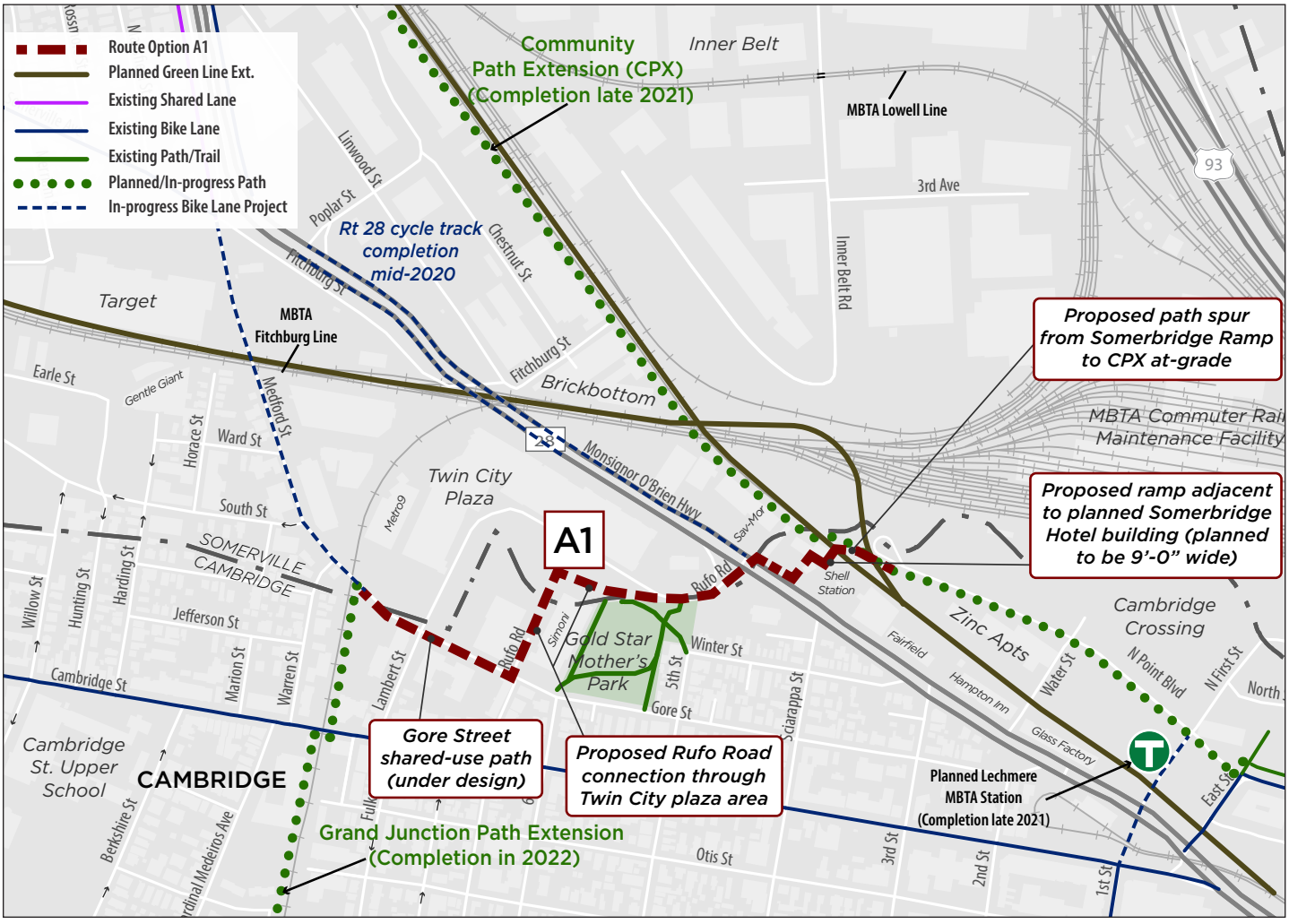
ROUTE OPTION A1: RUFO ROAD

Option A1 leverages the City of Cambridge's proposal* to build a shared-use path along the south side of Gore Street and extends the path's alignment along Rufo Road -- just west of the DCR Simoni Rink building. A widened path route just east of the rink is also possible. Option A1 uses an improved sidewalk along the north side of McGrath Highway and connects to the CPX via a proposed 9' wide ramp from McGrath Highway and through the Somerbridge Hotel development site. In the event that a ramp at Sav-Mor or Somerbridge is not allowed, the Route 28 options are available for the other options as well, though they do not benefit from the short distance between the CPX and the GJP and the direct connections to the neighborhoods and Twin City Plaza.

**Note that the City of Cambridge's proposal for the shared-use path runs between the south portion of Rufo Road and the head-in parking just west of the rink building. Swapping the parking with the shared-use path would be ideal but could lead to conflicts due to snow falling from the vaulted roof of the rink. An engineered solution to protect path users could be possible, however, but would require close coordination between City of Cambridge and DCR officials.*

Route A1 (and A2) would provide pedestrian and bicycle infrastructure improvements at the Rufo Road/McGrath Highway intersection (Image looking north east)

ROUTE OPTION A1: RUFO ROAD



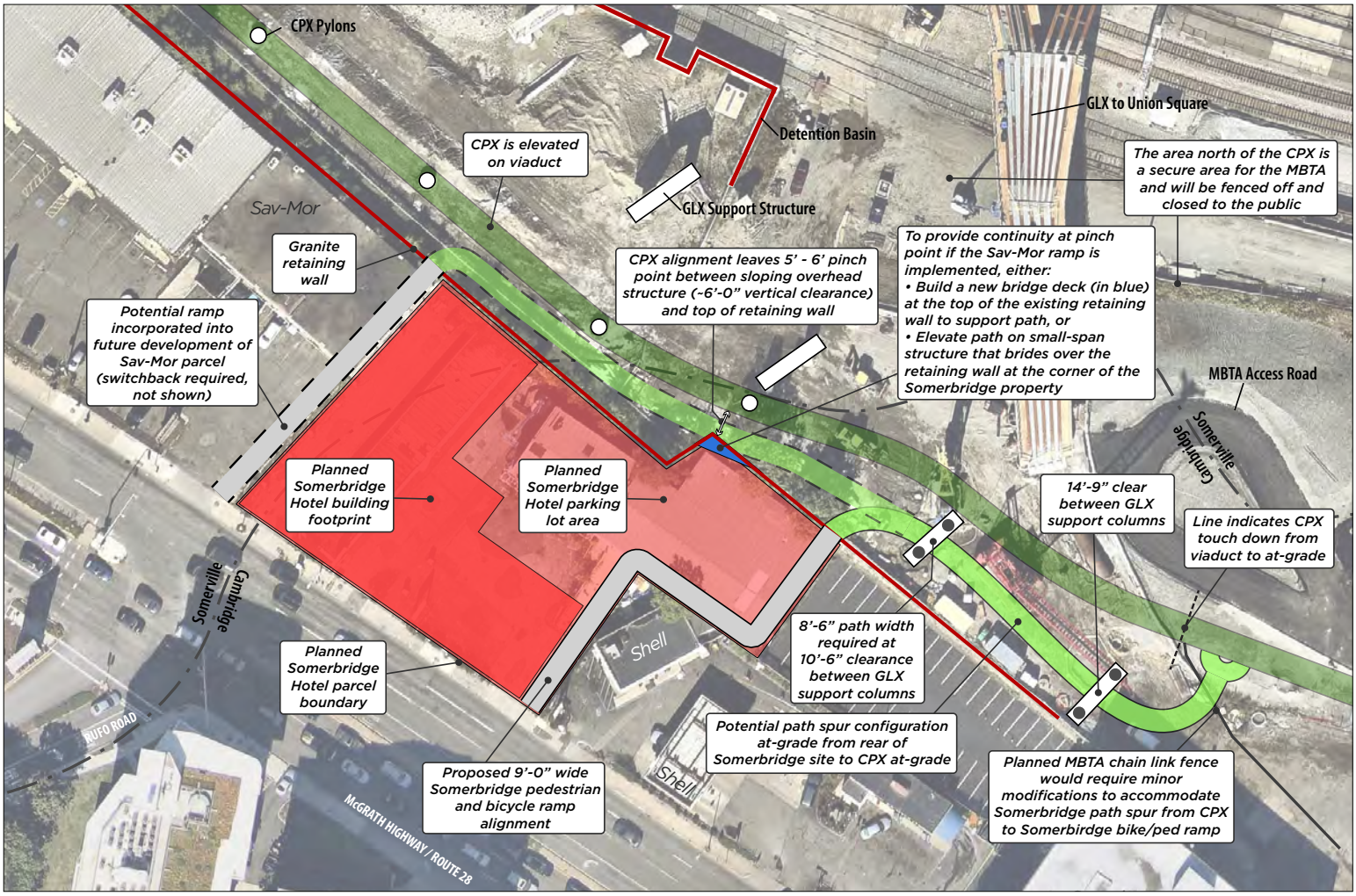


Diagram illustrating the potential link between the Community Path Extension and a future ramp within the Somerbridge site and additional constraints

CPX-TO-GJP EVALUATION TABLE

ROUTE OPTION A1: RUFO ROAD

	EVALUATION CRITERIA		
	SAFETY / COMFORT	CONNECTIVITY	PROPERTY ROW
PROS	• Most of route is highly visible with lots of "eyes on the trail". • Route will include primarily sidepath designs with some separated bike lanes in places.	• Provides strong access to both Twin City shopping and Gold Star Mothers Park. • Enhanced access to the path connection from East Cambridge neighborhood.	• Much of the corridor is within public street rights of way. • Incorporates planned/ funded projects along Gore St (City of Cambridge) and at the Somerbridge hotel site.
CONS	• Route incorporates a number of 90-degree angle turns (along Rufo Rd and within the Somerbridge project). • Bottom end of the Somerbridge project ramp will require creative design for safe access to the Route 28 corridor.	• Narrow (9'-0") and winding ramp within the Somerbridge project creates some awkward connections to the CPX. • Path connection from Gore Street along the Rufo Rd right-of-way between the CHA building and Simoni Rink will be tight due to two-way traffic and likely desire to preserve parking.	• Will require negotiations with both City of Cambridge and DCR to provide ADA-compliant route along Rufo Rd and the west side of the skating rink building. • Ongoing negotiations with Somerbridge developer required. • Future negotiations with potential Sav-Mor developer required.

ROUTE OPTION A1: RUFO ROAD IMPACTED PROPERTIES

A1: RUFO ROAD IMPACTED PROPERTIES MAP

A1: RUFO ROAD IMPACTED PROPERTIES TABLE

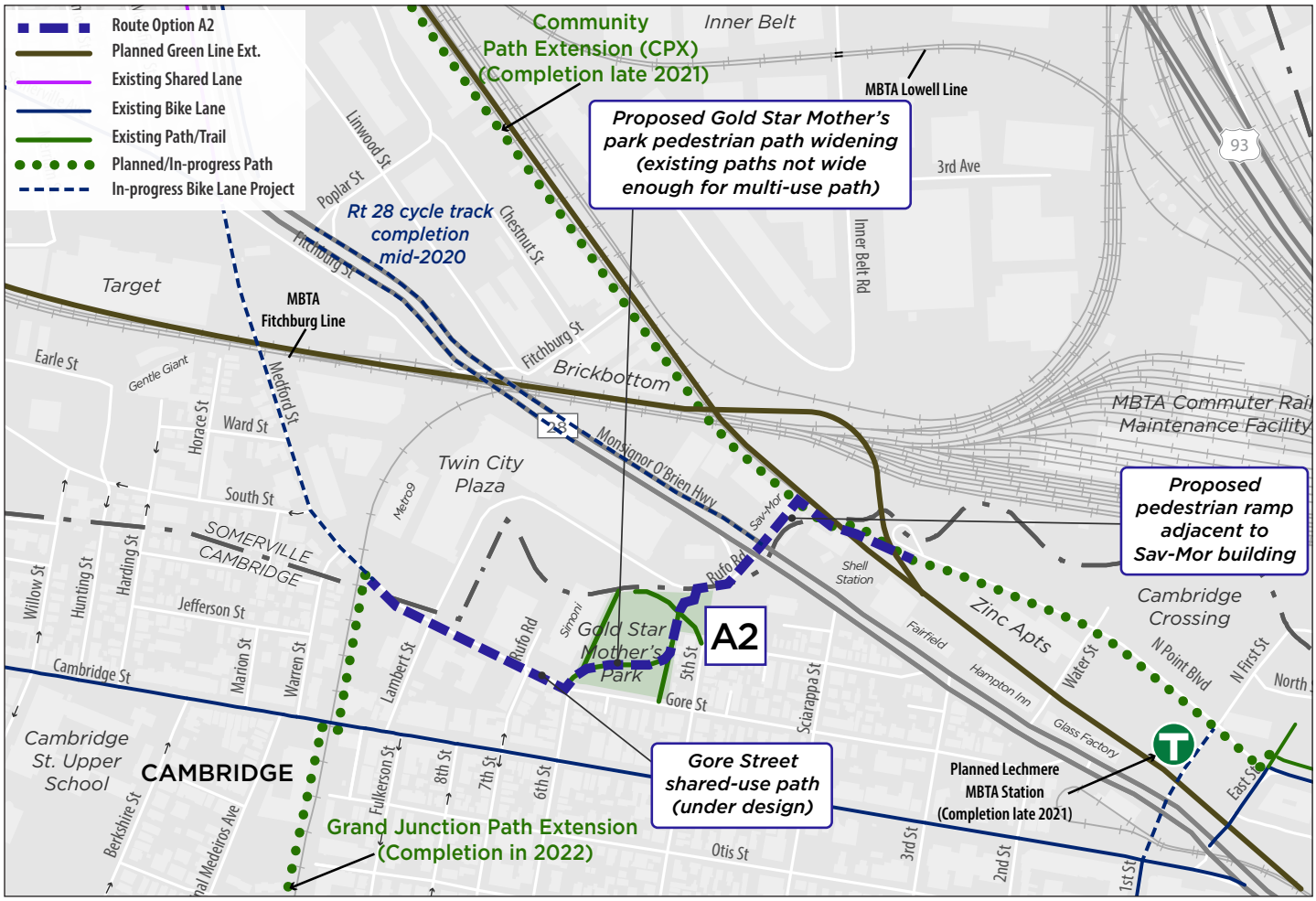
ROUTE	ID	USE CODE	SITE ADDRESS	LOT SIZE	OWNER SHIP	OWNER	OWNER ADDRESS	NOTES
A1	01	3230	22 McGrath Hwy	11.75 acres	Private	Twin City Plaza LLC	PO BOX 790830, San Antonio, TX	Twin City Plaza retail
	02	936	161 Gore St	0.27 acres	Public	City of Cambridge	City Hall, Cambridge, MA	Rufo Road ROW
	03	930	123 Gore St	3.93 acres	Public	City of Cambridge	57 Inman St, Cambridge, MA	Gold Star Mothers Park
	04	3350	1 McGrath Hwy	0.37 acres	Private	Anthony Previte	153 Russell Ave, Watertown, MA	Somerbridge Hotel Site (formerly coin-op car wash)
	05	316	263 Monsignor O'Brien Hwy	0.37 acres	Private	Anthony Previte	153 Russell Ave, Watertown, MA	Somerbridge Hotel Site (formerly storage / warehouse)
	06	975	# Monsignor O'Brien Hwy	0.66 acres	Public	MBTA	10 Park Plaza, Boston, MA	GLX site
	07	975	# Charlestown Ave	0.35 acres	Public	MBTA	10 Park Plaza, Boston, MA	GLX site
	08	013	32R Charlestown Ave	21.88 acres	Private	DW NP Property, LLC	575 Market Street, San Francisco, CA	GLX Site / Cambridge Crossing

Source: https://docs.digital.mass.gov/dataset/massgis-data-standardized-assessors-parcels

ROUTE OPTION A2: GOLD STAR MOTHERS PARK

Option A2 leverages the City of Cambridge's proposal to build a shared use path along the south side of Gore Street and extends the path alignment through Gold Star Mother's Park, uses portions of Rufo Road and connects to the CPX via a potential path and ramp from McGrath Highway and through a redevelopment site currently occupied by the Sav-Mor Liquors. (In the event that a ramp at Sav-Mor or Somerbridge is not allowed, the Route 28 options are available for the other options as well.)

ROUTE OPTION A2: GOLD STAR MOTHERS PARK



CPX-TO-GJP EVALUATION TABLE

ROUTE OPTION A2: GOLD STAR MOTHER'S PARK

	EVALUATION CRITERIA		
	SAFETY / COMFORT	CONNECTIVITY	PROPERTY ROW
PROS	• Most of route is highly visible with lots of "eyes on the trail". • Route will include primarily sidepath designs with some separated bike lanes in places.	• Provides strong access to Gold Star Mothers Park and East Cambridge neighborhood. • Most direct link to the CPX from the Grand Junction Path.	• Much of the corridor is within public street rights of way, or in City park. • Incorporates planned/funded project along Gore St (City of Cambridge) .
CONS	• Even with a wider path through the park, some conflicts with playground and play field users is likely at peak times. • Route includes a pinch point behind the Somerbridge project due to support columns for the CPX. • Loss of mature trees as result of necessary path widening.	• Requires some access through parking lot to reach Twin City Plaza businesses.	• Many unknowns related to timeline for the redevelopment of the Sav-Mor site. • Potential concern about widening Gold Star Mother's Park paths by Cambridge Community Development Department and/ or the Open Space Committee.

ROUTE OPTION A2: GOLD STAR MOTHERS PARK IMPACTED PROPERTIES

A2: GOLD STAR MOTHERS PARK IMPACTED PROPERTIES MAP

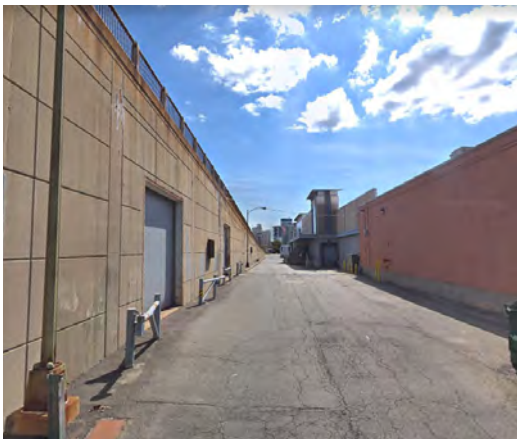
A2: GOLD STAR MOTHERS PARK IMPACTED PROPERTIES TABLE

ROUTE	ID	USE CODE	SITE ADDRESS	LOT SIZE		OWNER	OWNER ADDRESS	NOTES
A2	01	3230	22 McGrath Hwy	11.75 acres	Private	Twin City Plaza LLC	PO BOX 790830, San Antonio, TX	Twin City Plaza retail
	02	936	161 Gore St	0.27 acres	Public	City of Cambridge	City Hall, Cambridge, MA	Rufo Road ROW
	03	930	123 Gore St	3.93 acres	Public	City of Cambridge	57 Inman St, Cambridge, MA	Gold Star Mothers Park
	04	3350	1 McGrath Hwy	0.37 acres	Private	Anthony Previte	153 Russell Ave, Watertown, MA	Somerbridge Hotel Site (formerly coin-op car wash)
	05	316	263 Monsignor O'Brien Hwy	0.37 acres	Private	Anthony Previte	153 Russell Ave, Watertown, MA	Somerbridge Hotel Site (formerly storage / warehouse)
	06	975	# Monsignor O'Brien Hwy	0.66 acres	Public	MBTA	10 Park Plaza, Boston, MA	GLX site

Source: https://docs.digital.mass.gov/dataset/massgis-data-standardized-assessors-parcels

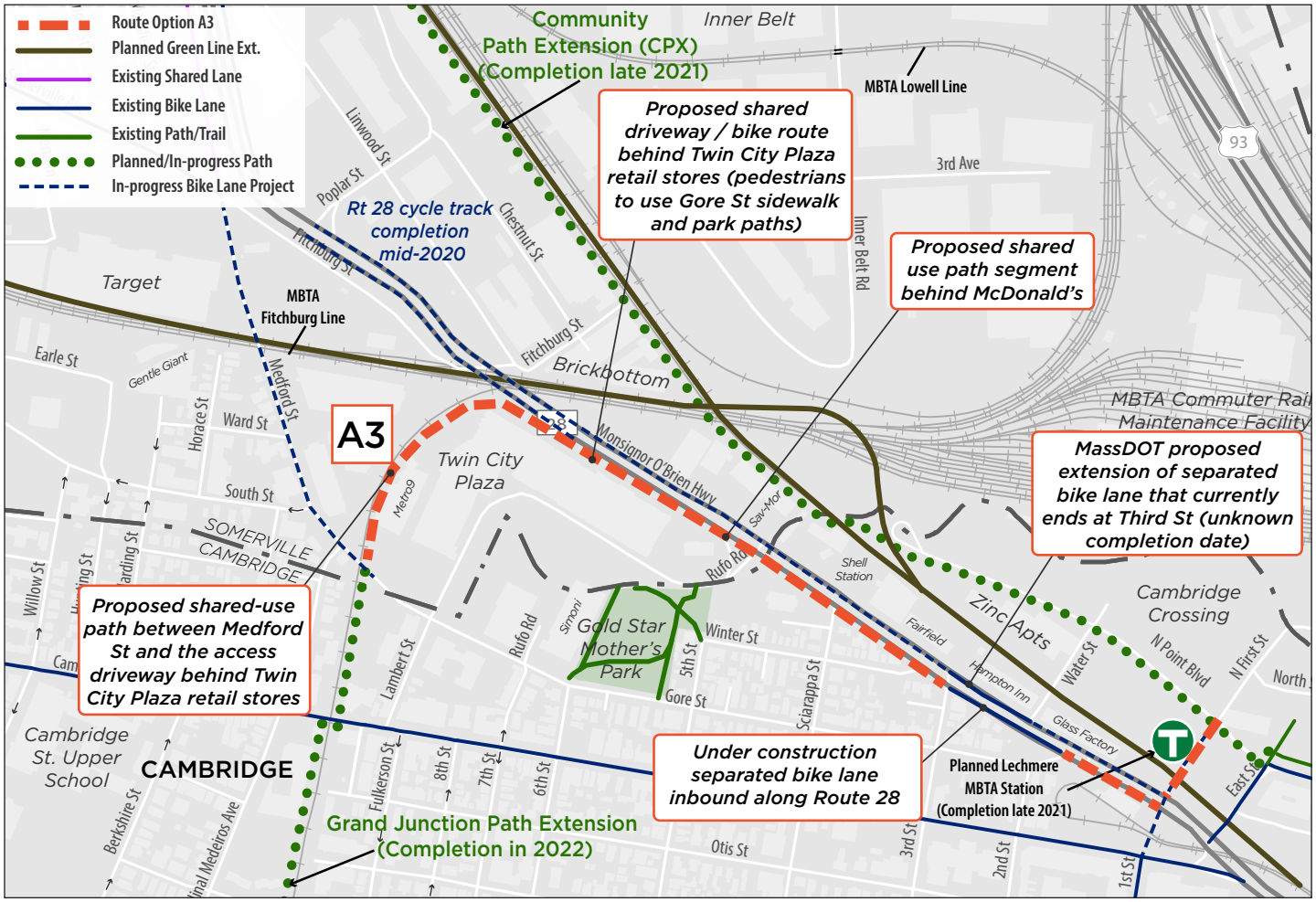
ROUTE OPTION A3: MCGRATH HIGHWAY

Option A3 incorporates a shared use path along the Grand Junction corridor to the MBTA Fitchburg Line, a shared bikeway along the service drive behind the Twin City Plaza and a mix of existing and proposed bike lanes on Route 28 to provide a link to the Lechmere Green Line station.



View of potential shared driveway area behind Twin City Plaza building (Image: Google street view, Sept. 2018)

ROUTE OPTION A3: MCGRATH HIGHWAY



Construction photo of the sidewalk-level separated bike lane on the north side of Route 28 near water Street (Image looking north west)

CPX-TO-GJP EVALUATION TABLE

ROUTE OPTION A3: MCGRATH HIGHWAY

	EVALUATION CRITERIA		
	SAFETY / COMFORT	CONNECTIVITY	PROPERTY ROW
PROS	• Maximizes Grand Junction Path corridor. • Creates additional incentive for DCR/MassDOT to provide separated bike lanes on O'Brien Hwy.	• Provides direct access to businesses along O'Brien Hwy between Rufo Road and N 1st St. • Shortest route to Lechmere Station and to path within Cambridge Crossing.	• Access through either the Somerbridge or Sav-Mor properties is not required. • Negotiations with MBTA for use of GLX land is not required. • If trail easement isn't feasible on north side of Twin City Property, can utilize features of options A or B to go from Gore to McGrath.
CONS	• Requires a shared roadway with delivery vehicles behind Twin City Plaza. • Lack of visibility along west half of the route will create an intimidating environment for some path users, especially at night. • Noise and air pollution exposure for users since route is on McGrath Highway. Higher stress and danger due to presence of cars.	• Lack of connections to East Cambridge neighborhood, Twin City Plaza businesses, and Gold Star Mother's Park. • Significant out of direction travel for access to CPX, westbound.	• Requires negotiations with Twin City Plaza property owners / MassDOT for trail easement. • MassDOT buy-in required to provide separated bike lane in inbound direction.

ROUTE OPTION A3: MCGRATH HIGHWAY IMPACTED PROPERTIES

A3: MCGRATH HIGHWAY IMPACTED PROPERTIES MAP

A3: MCGRATH HIGHWAY IMPACTED PROPERTIES TABLE

ROUTE	ID	USE CODE	SITE ADDRESS	LOT SIZE		OWNER	OWNER ADDRESS	NOTES
A3	01	3230	22 McGrath Hwy	11.75 acres	Private	Twin City Plaza LLC	PO BOX 790830, San Antonio, TX	Twin City Plaza retail
	02	013	32R Charlestown Ave	21.88 acres	Private	DW NP Property, LLC	575 Market Street, San Francisco, CA	Cambridge Crossing

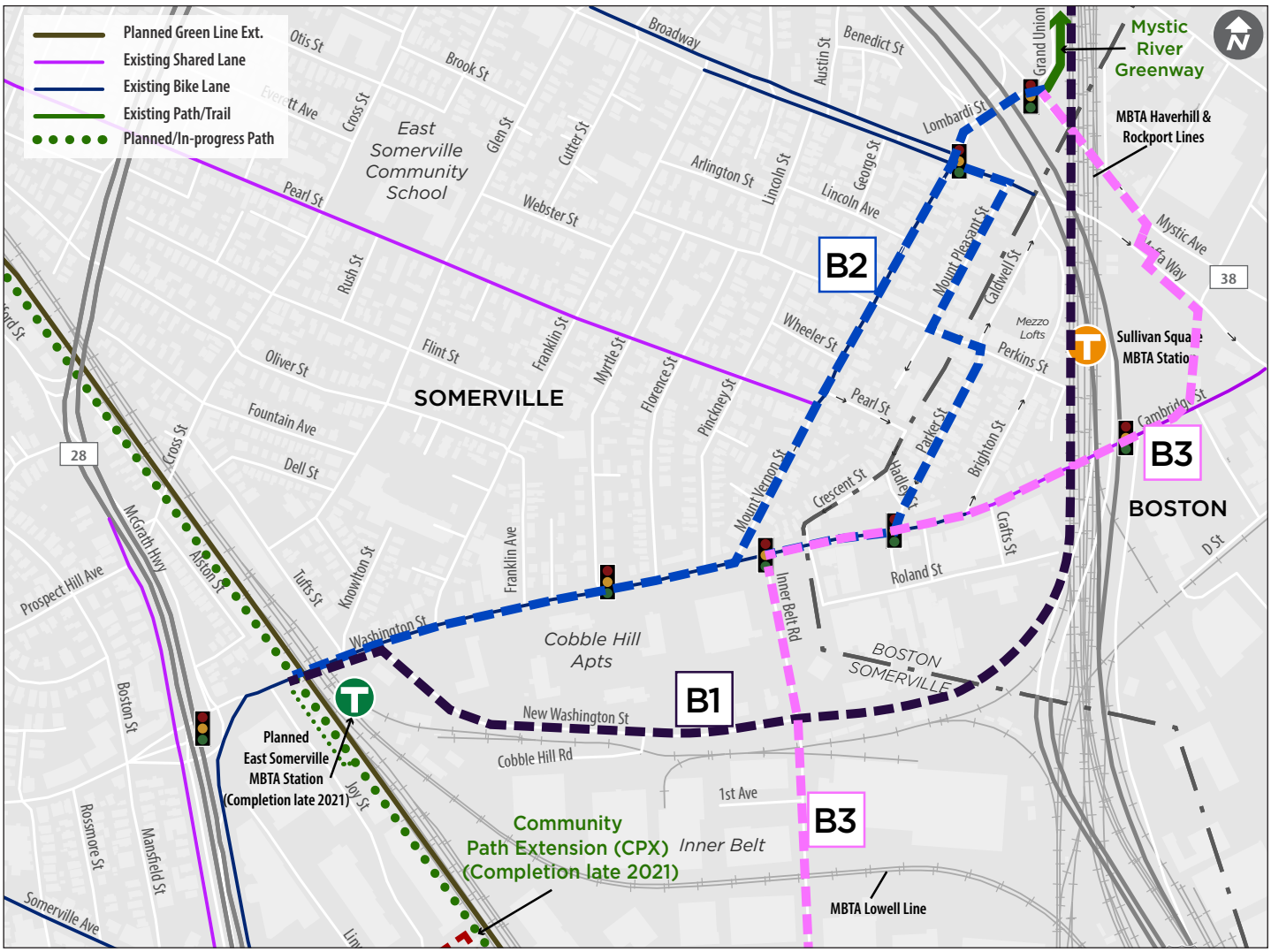
Source: https://docs.digital.mass.gov/dataset/massgis-data-standardized-assessors-parcels

2.2 Study Area B: Mystic River Greenways - Community Path Extension Connection

Three route options are proposed to provide connectivity between the Mystic River Greenways (MRG) and the Community Path Extension (CPX). The primary option looks at a route that incorporates the underutilized west portion of the rail corridor that carries the Orange Line and two MBTA commuter rail lines. This study also explores alternatives that avoid use of the rail corridor. One option proposes striped bike lanes on a handful of streets in East Somerville, while the other proposes to widen sidewalks in the Sullivan Square MBTA station area and along Washington Street to create a protected facility for bicyclists on these busy roadways. The following three route options were analyzed:

- B1: Rail Corridor
- B2: East Somerville On-Street
- B3: Sullivan Square Cycle Track to Brickbottom / Cambridge Crossing

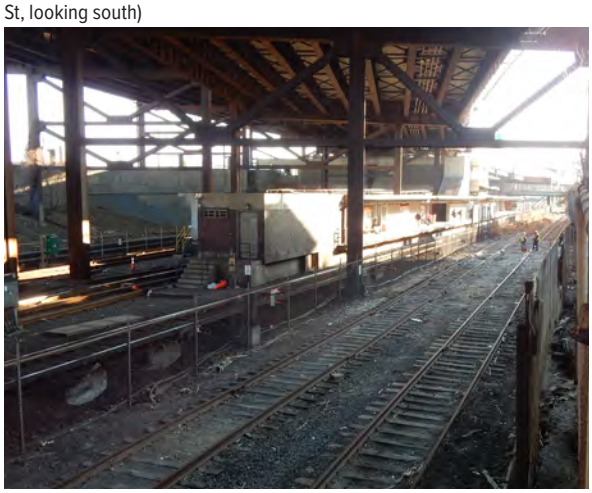
STUDY AREA B: ROUTE OPTIONS OVERVIEW MAP



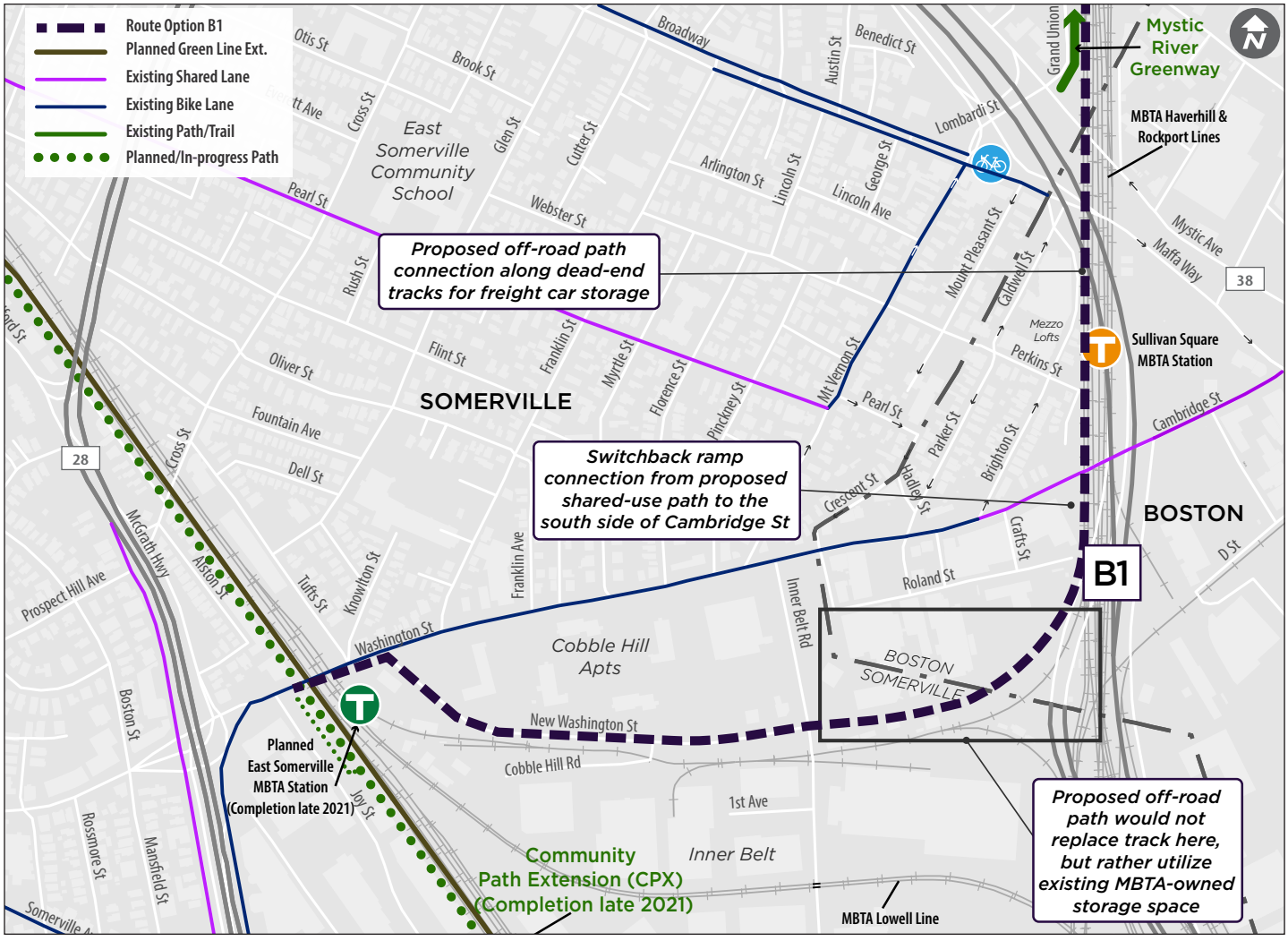
ROUTE OPTION B1: RAIL CORRIDOR

Option B1 relies on the use of the underutilized west edge of the approximately 25'-wide rail right-of-way to provide a rail-with-trail connection from the Mystic River Greenway Path next to the Partners Building down to the Inner Belt, where the route would continue west along a two-way separated bike lane alongside a narrower New Washington Street. The 10' - 12' wide rail-with-trail (with discreet sections potentially narrowing to 8') could replace one of the two underutilized dead-end freight tracks, with an 8'-tall security fence between the path and the remaining rail tracks.

Option B1 would envision the replacement of one of the dead end freight rail tracks with a shared use path connection (Image taken from Brighton St, looking south)



ROUTE OPTION B1: RAIL CORRIDOR



Coming from the north, the potential path corridor would run just to the north (left) side of the existing tracks that cross Inner Belt Road (Image looking east)

MRG-TO-CPX EVALUATION TABLE

ROUTE OPTION B1: RAIL CORRIDOR

	EVALUATION CRITERIA		
	SAFETY / COMFORT	CONNECTIVITY	PROPERTY ROW
PROS	• Route provides full separation from motor vehicles from end to end. • Avoids need to cross Mystic Ave or Broadway in Somerville.	• Seamless connection with the Mystic River Greenway segment adjacent to the Partners Building. • Most intuitive link between Assembly Square, the Inner Belt and the CPX.	• Extreme width of New Washington St offers straightforward opportunity to create a separated bike lane. • No need to adjust signal design at Mystic/Lombardi St.
CONS	• Opportunity for only a maximum 10' wide paved path along the roughly 1,000 foot section from the east end of Perkins St to Mystic Ave. • Lack of visibility along rail corridor route could create an intimidating environment for some path users.	• Lack of connection to East Somerville neighborhood / Washington St corridor businesses / Sullivan Square MBTA station, unless switchback ramp to Cambridge St is provided.	• Property negotiation required. • MBTA is maintaining two dead-end tracks along the rail envelope to provide storage for freight cars. • PanAm retains user rights for rail. • Several pinch points exist along rail route which require further analysis. • Proposed path alignment may require removal of ~12 southern-most parking spaces at City Club (that appear to be on MBTA property).

ROUTE OPTION B1: RAIL CORRIDOR IMPACTED PROPERTIES

B1: RAIL CORRIDOR IMPACTED PROPERTIES MAP

B1: RAIL CORRIDOR IMPACTED PROPERTIES TABLE

ROUTE	ID	USE CODE	SITE ADDRESS*	LOT SIZE	OWNER SHIP	OWNER	OWNER ADDRESS	NOTES
B1	01**	(n/a)	Somerville	--	Public	Commonwealth of Mass.	(n/a)	Property abuts (and may extend) into City Club parking lot -- and may require relocation of ~12 parking spaces that appear to be on MBTA-owned land.
	02	Commercial	Boston	1.29 acres	Private	Clear Channel Outdoor, INC.	89 Maple St, Stoneham, MA	Likely a billboard lease agreement.
	02	Exempt	Boston	1.29 acres	--	Commonwealth of Mass.	# Roland, Charlestown, MA	
	03	Exempt	Boston	4.1 acres	Public	MBTA	# Cambridge, Charlestown, MA	
	03	Commercial	Boston	4.1 acres	Private	Clear Channel Outdoor, INC.	89 Maple St, Stoneham, MA	Likely a billboard lease agreement.
	04	Commercial	Boston	3.14 acres	Private	Donuts-N-Donuts, Inc.	1185 Hancock St, Quincy, MA	
	04	Commercial	Boston	3.14 acres	Private	Al-Shiblawi Falah	92 Light St, Lynn, MA	
	04	Exempt	Boston	3.14 acres	Public	MBTA	# Cambridge, Charlestown, MA	
	04	Commercial	Boston	3.14 acres	Private	Clear Channel Outdoor Inc.	89 Maple St, Stoneham, MA	Likely a billboard lease agreement.
	05	Exempt	Boston	0.61 acres	Public	MBTA	# Main, Charlestown, MA	
	06	Exempt	Boston	0.4 acres	Public	MBTA	# Sherman, Charlestown, MA	
	07		Somerville	5.28 acres	Public	MBTA	10 Park Plaza, Boston, MA	

Source: https://docs.digital.mass.gov/dataset/massgis-data-standardized-assessors-parcels

*Because no addresses were provided in the tax parcel ownership data, the city where the parcel is located is used instead in this column.

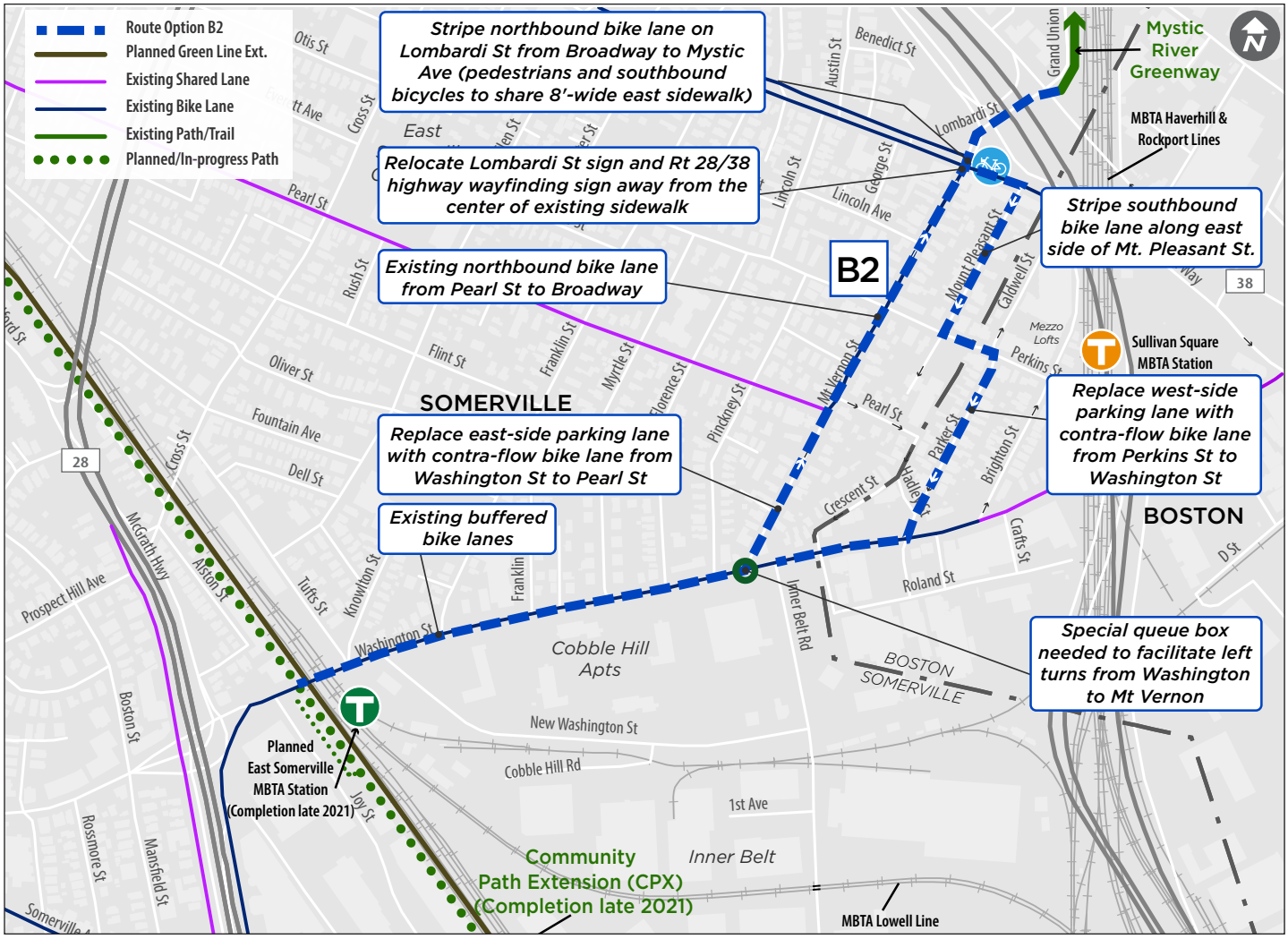
**Source for Property ID 01: http://ifa.somervillema.gov.s3.amazonaws.com/documents/assessing-maps/parcel-map-107.pdf

ROUTE OPTION B2 & B3: EAST SOMERVILLE ON-STREET

Route Option B2 and B3 can be considered a short-term pedestrian/bicycle links to the CPX until use of the nearby rail right of way becomes feasible and/or fundraising is complete. Though not at the level of providing a path-like experience, these options provide striped bike lanes, cycle tracks and other improvements to enhance connections from the Mystic Greenways to the CPX ramp-access point at the East Somerville MBTA Station. Both options also feature the long-term connection to Cambridge Crossing (see B3 map) at the south end of Inner Belt Road.

Mount Pleasant St, Perkins St, and Pearl St are all one-way southbound with parking, allowing for the creation of a shared roadway environment (Image: google streetview)

ROUTE OPTION B2: EAST SOMERVILLE ON-STREET



Option B2 provides southbound access from Assembly Square towards East Somerville using the existing 8'-wide sidewalk, while northbound bicycles would use a striped bike lane on Lombardi Street (Image looking south west)

MRG-TO-CPX EVALUATION TABLE

ROUTE OPTION B2: EAST SOMERVILLE ON-STREET

	EVALUATION CRITERIA		
	SAFETY / COMFORT	CONNECTIVITY	PROPERTY ROW
PROS	• Pedestrians and bicyclists will use well-lit and highly visibly public streets along the route.	• Provides shortest distance between the Mystic River Greenway and the CPX. • Links to East Somerville neighborhood and Washington St businesses.	• Entire route is within public ROW, primarily City of Somerville streets. • Leverages existing bike lanes along Washington St.
CONS	• Comfort level for bicyclists is fully dependent on removal of on-street parking. • Requires crossing a number of busy signalized intersections. • Uphill bike route on neighborhood streets.	• Connectivity is dependent on contra-flow bike lanes which can be awkward.	• Requires removal of curb-side parking in a dense neighborhood (multiple blocks). • Lombardi St creates a challenge for two-way pedestrian/bike traffic on the east side.

ROUTE OPTION B2: EAST SOMERVILLE ON-STREET IMPACTED PROPERTIES

B2: EAST SOMERVILLE ON-STREET IMPACTED PROPERTIES MAP

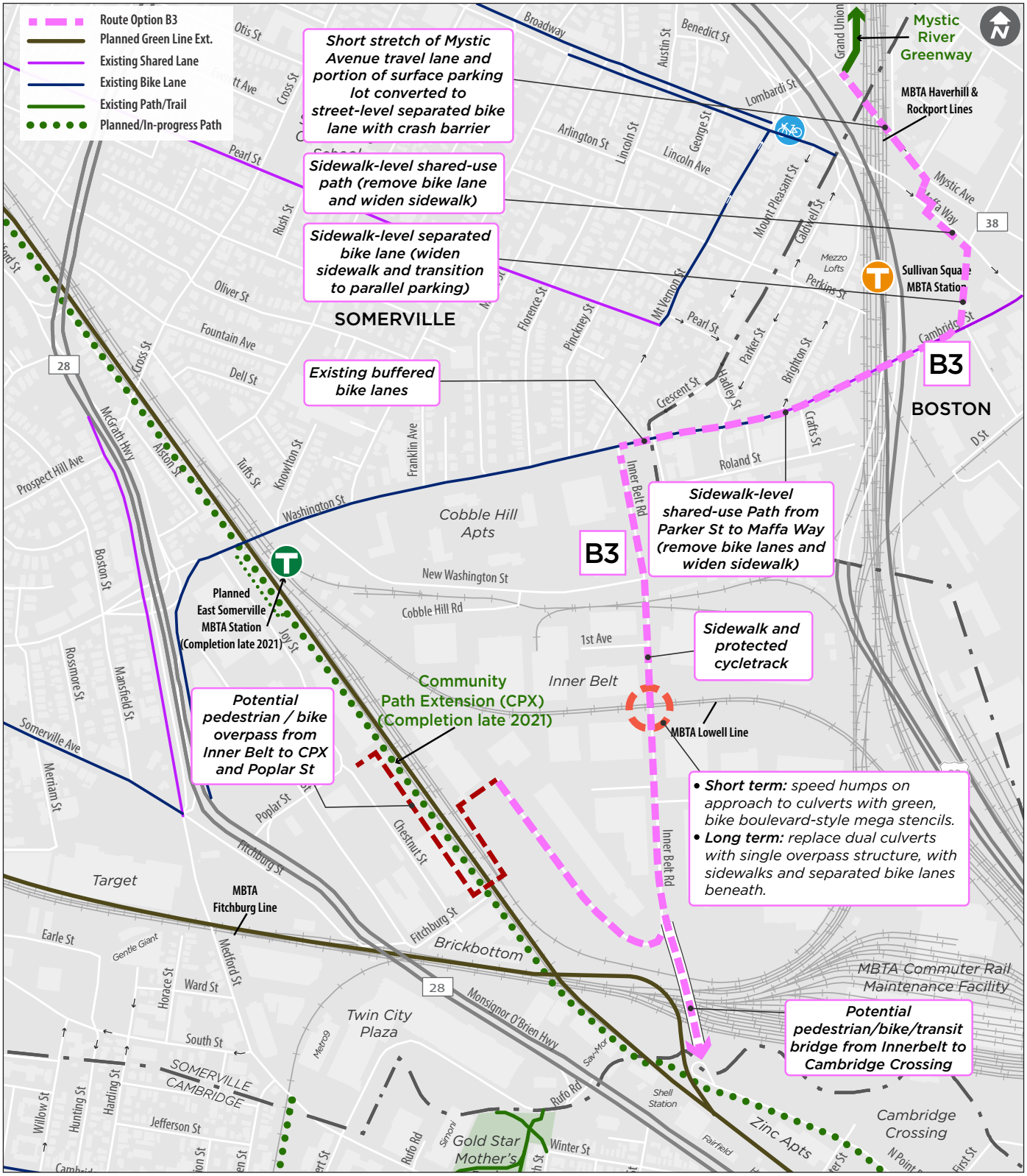
B2: EAST SOMERVILLE ON-STREET IMPACTED PROPERTIES TABLE

There are no private parcels impacted by route option B2 because it is entirely within the existing roadway right-of-way.

ROUTE OPTION B3: SULLIVAN SQUARE CYCLE TRACK TO BRICKBOTTOM AND CAMBRIDGE CROSSING

[See page 27 for description]

ROUTE OPTION B3: SULLIVAN SQUARE CYCLE TRACK TO BRICKBOTTOM / CAMBRIDGE CROSSING



On the east side of the I-93 overpass, the proposed route would widen the existing sidewalk to accommodate a barrier-protected shared-use path, which would require removal of the existing on-road bike lane. (View looking east. Image: Google street view.)

The proposed route would include a street-level separated bike lane with crash barrier along Main St from the Maffa Way bus access west of Gardner St (shown) up to Grand Union Boulevard (Image: Google street view.)

MRG-TO-CPX EVALUATION TABLE

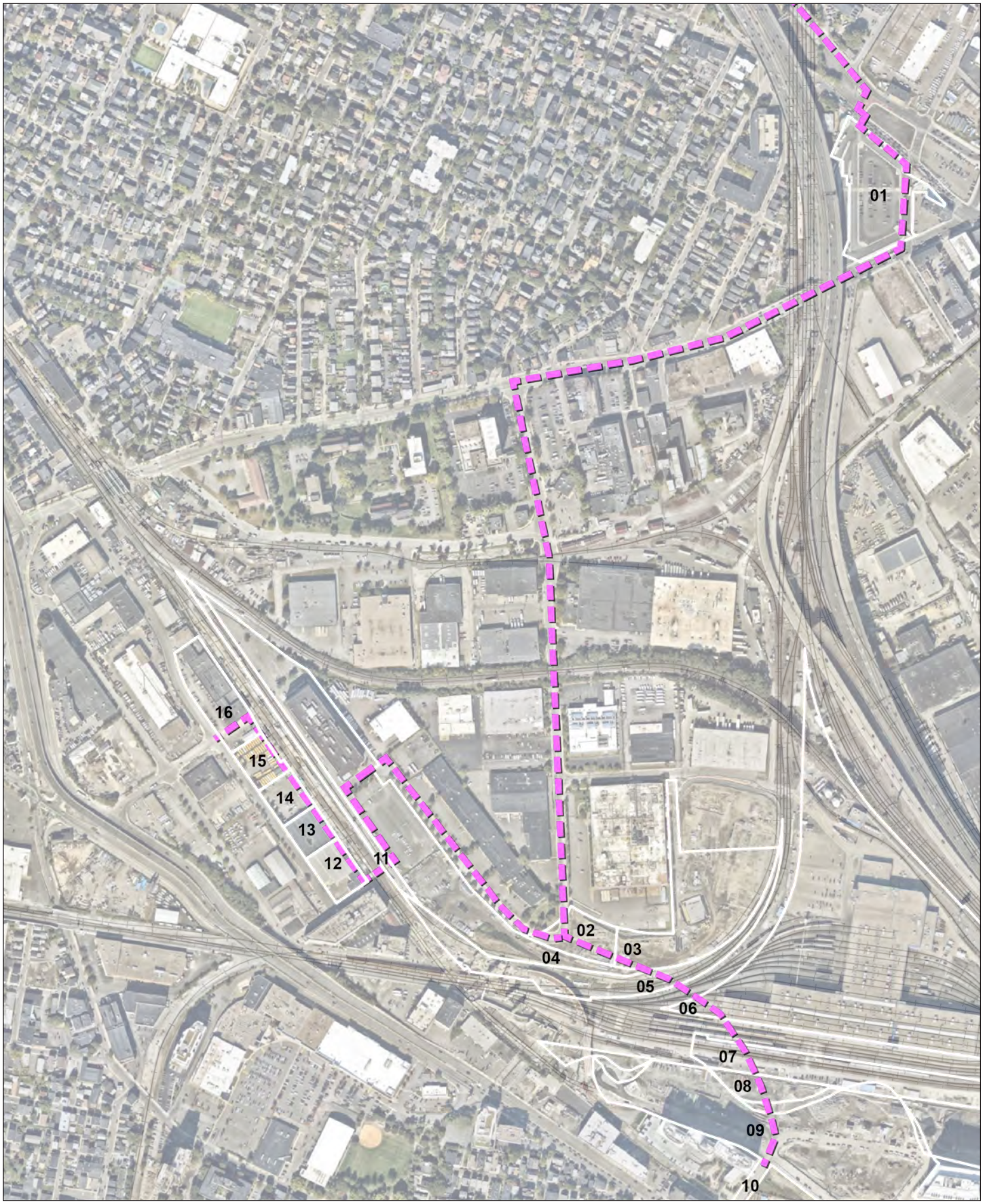
ROUTE OPTION B3: SULLIVAN SQUARE CYCLE TRACK TO BRICKBOTTOM / CAMBRIDGE CROSSING

	EVALUATION CRITERIA		
	SAFETY / COMFORT	CONNECTIVITY	PROPERTY ROW
PROS	• Sidewalk level cycle track or shared use path segments of the route will offer well-lit, highly visible, and high level of comfort for all users. • Eastbound bikes will need to transition to north side of Washington St to access two-way sidepath.	• Provides direct connection to Sullivan Square MBTA station and businesses along Washington St.	• Most of the route is within public ROW, avoids need to negotiate with MBTA and MassDOT about the underutilized rail corridor ROW. • Leverages existing bike lanes along Washington St.
CONS	• Pedestrian access on narrow sidewalks along portions of the corridor. • Shared use path segments will be tight and may create conflicts between bicyclists and transit users. • Path users required to navigate MBTA buses and highway off-ramp motor vehicle traffic.	• Requires some cumbersome out of direction travel to access the Inner Belt. • Limited connectivity to East Somerville neighborhood.	• Will require significant work with the MBTA and MassDOT to retrofit some sidewalks as shared use paths and/or cycle tracks. • May require narrowing Washington St to accommodate sidepath on north side. • Bike / ped / transit bridge requires negotiations among Somerville, Cambridge, Cambridge Crossing, and MassDOT/MBTA

Source: https://docs.digital.mass.gov/dataset/massgis-data-standardized-assessors-parcels

ROUTE OPTION B3: SULLIVAN SQ CYCLE TRACK TO BRICK BOTTOM

B3: SULLIVAN SQ CYCLE TRACK TO BRICK BOTTOM IMPACTED PROPERTIES MAP



B3: SULLIVAN SW CYCLE TRACK TO BRICK BOTTOM IMPACTED PROPERTIES TABLE

ROUTE	ID	USE CODE	SITE ADDRESS	LOT SIZE	OWNER SHIP	OWNER	OWNER ADDRESS	NOTES
B3	01	Exempt		3.31 acres	Public	MBTA	# Cambridge, Charlestown, MA	Sullivan Square Station parking area
	02	972V	0 Inner Belt Rd	1.21 acres	Public	MBTA	10 Park Plaza, Boston, MA	
	03	9720	20 Third Ave	4.96 acres	Public	MBTA	10 Park Plaza, Boston, MA	
	04	402C	200 Inner Belt Rd	8.57 acres	Private	North River II LLC	224 12th Ave, New York, NY	
	05	972V	0 Inner Belt Rd	3.27 acres	Public	MBTA	10 Park Plaza, Boston, MA	
	06	9720	Rear Inner Belt Rd	22.9 acres	Public	MBTA	10 Park Plaza, Boston, MA	
	07	972V	0 Inner Belt Rd	4.3 acres	Public	MBTA	10 Park Plaza, Boston, MA	
	08	4400	250 Dawes St	5.5 acres	Private	DW NP Property, LLC	575 Market Street, San Francisco, CA	DivCo West North Point (Cambridge Crossing)
	09	013	32R Charlestown Ave	21.15 acres	Private	DW NP Property, LLC	575 Market Street, San Francisco, CA	DivCo West North Point (Cambridge Crossing)
	10	975	# Monsignor O'Brien Hwy	0.3 acres	Public	MBTA	10 Park Plaza, Boston, MA	Appears as Water Street right-of-way.
	11	972V	0 Inner Belt Rd	1.9 acres	Public	MBTA	10 Park Plaza Suite 5720	
	12	4010	28 Fitchburg St	0.85 acres	Private	Trust Sherman & Goldman Realty	230 Meadow Road, Boston, MA	Warehouse
	13	4010	28 Chestnut St	0.6 acres	Private	Lawrence Realty 28 Chestnut LLC	230 Meadow Road, Readville, MA	Warehouse
	14	3370	26 Chestnut St	0.65 acres	Private	26-Lawrence Realty LLC	300 Trade Center Suite 5410	Outbuildings
	15	4400	20 Chestnut St	0.64 acres	Private	Winitzer Charles M Trustee	14 Chestnut St, Somerville, MA	Outbuildings
	16	4010	86 Joy St	1.77 acres	Private	Joy St Limited Partnership	86 Joy St, Somerville, MA	Warehouse

Public Input Summary

In order to gauge stakeholder and community interest and receive comments related to the six alignment options presented earlier, an online survey was created by Alta and promoted by the Friends of the Community Path, the Friends of the Mystic to Charles Connector, and the Friends of the Grand Junction Path. The survey went live on April 9th and was closed on April 21st. A link to a recorded 20-minute presentation was included in the promotion of the online survey. The presentation, which walked viewers through the three routing options for each Study Area, replaced what would have been a public meeting, which was unfortunately canceled due to social distancing requirements related to the spread of COVID-19.

The flexibility for respondents to watch the presentation any time (versus a virtual public meeting held online at a set time) allowed us to reach a broad audience; 650 Survey Monkey responses were collected. A comprehensive breakdown of the answers to each question is included in the Appendix at the end of this report.

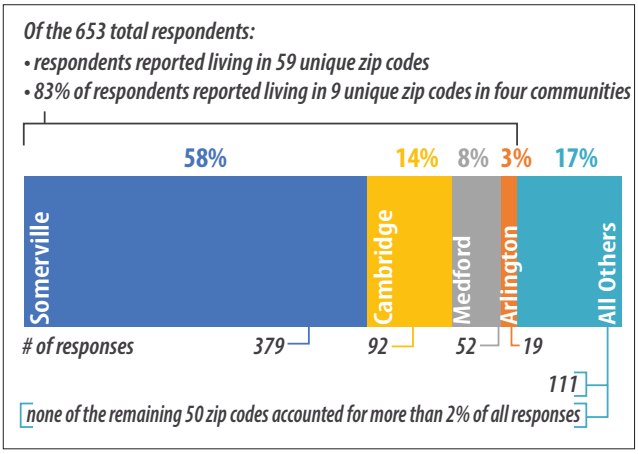
The respondents were overwhelmingly from north of the Charles River. See the bar chart at top right that summarizes the location where respondents reported living.

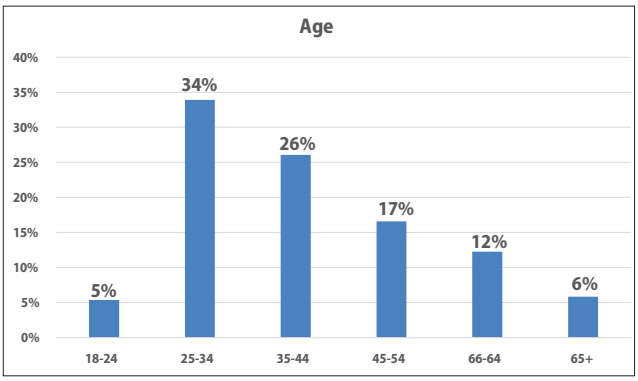
There was decent distribution of age ranges among survey respondents. The majority of survey respondents were in the age range between 24 and 44.

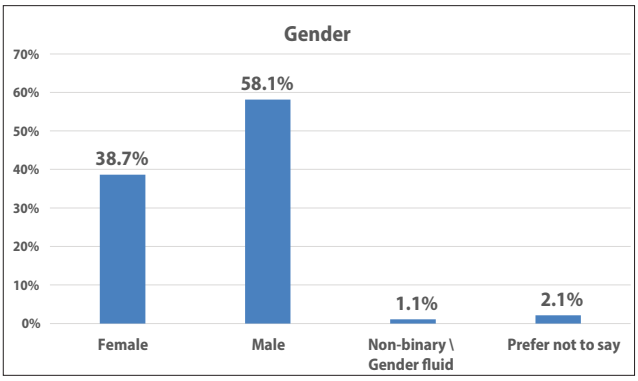
There were more male survey respondents than female, although nearly 39% identified as female.

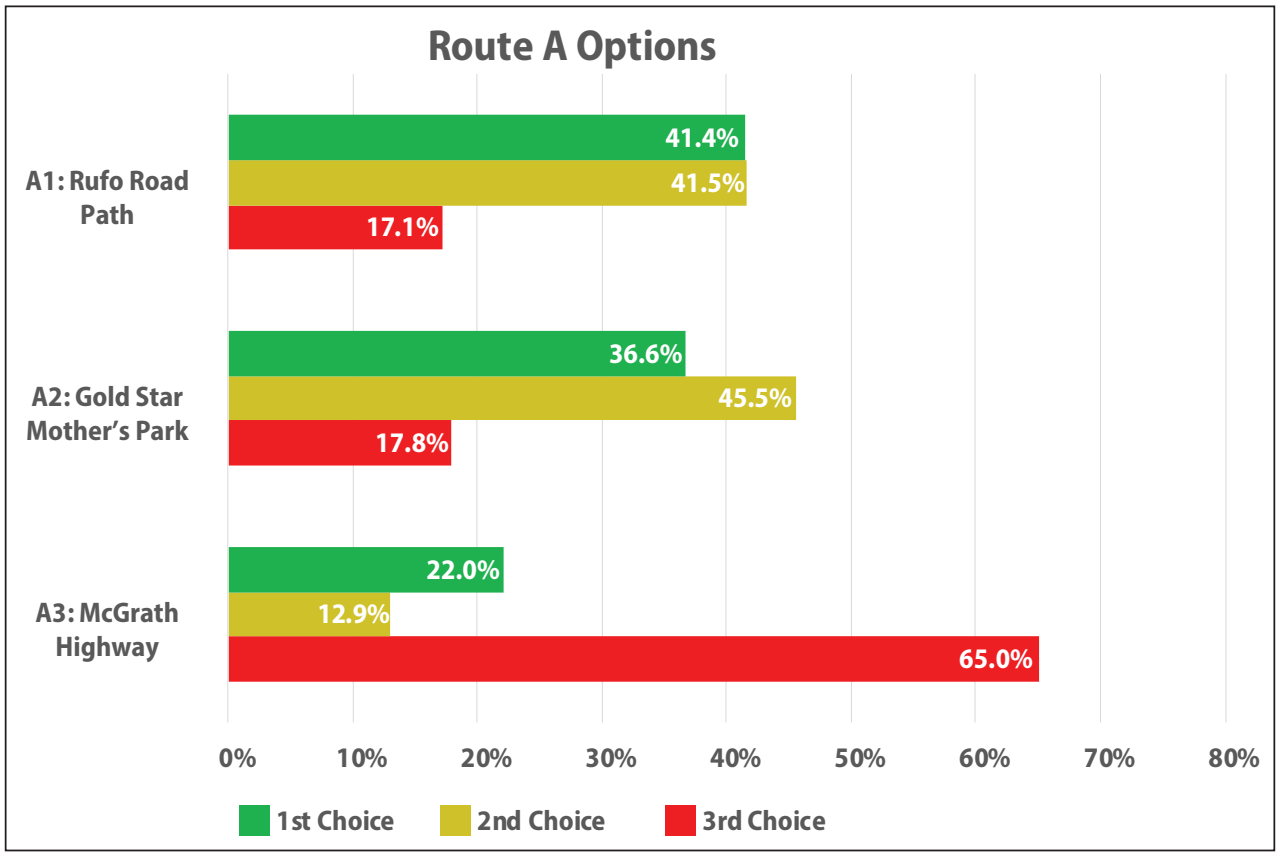
The primary questions featured in the survey asked respondents to rank each of the Study Area A and Study Area B route options. Respondents had the opportunity to rank their first, second, and third choices. See bar charts at right to see the breakdown of each of the choice rankings.

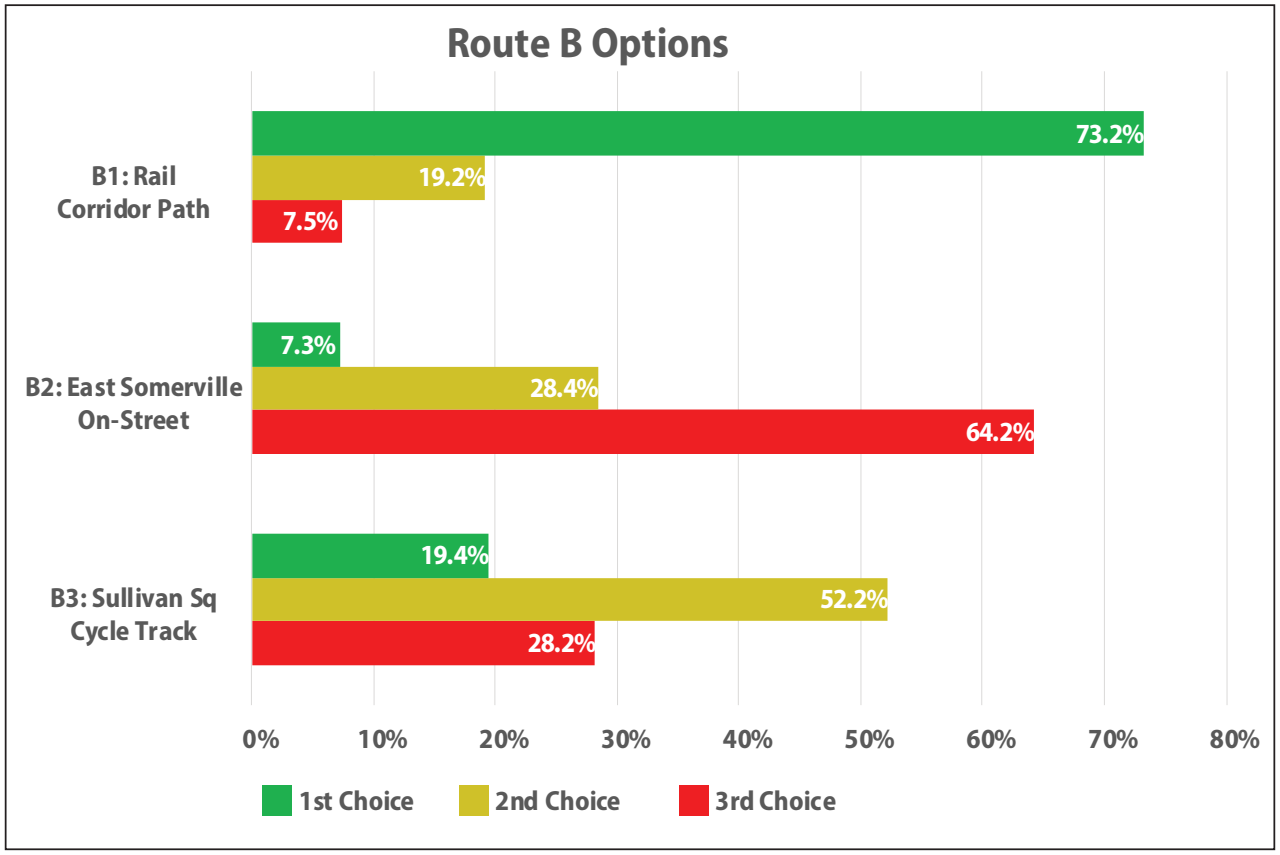
In Study Area A, respondents preferred a path within the Rufo Road right-of-way and Gold Star Mother's park over McGrath Highway. In Study Area B, respondents overwhelmingly preferred a path in the rail corridor envelope to on-street options in East Somerville. See bar charts on next page.








Route A Options
A1: Rufo Road Path
41.4%
41.5%
17.1%
A2: Gold Star Mother's Park
36.6%
45.5%
17.8%
A3: McGrath Highway
22.0%
12.9%
65.0%
0%
10%
20%
30%
40%
50%
60%
70%
80%
1st Choice
2nd Choice
3rd Choice


Route B Options
B1: Rail Corridor Path
73.2%
19.2%
7.5%
B2: East Somerville On-Street
7.3%
28.4%
64.2%
B3: Sullivan Sq Cycle Track
19.4%
52.2%
28.2%
0%
10%
20%
30%
40%
50%
60%
70%
80%
1st Choice
2nd Choice
3rd Choice

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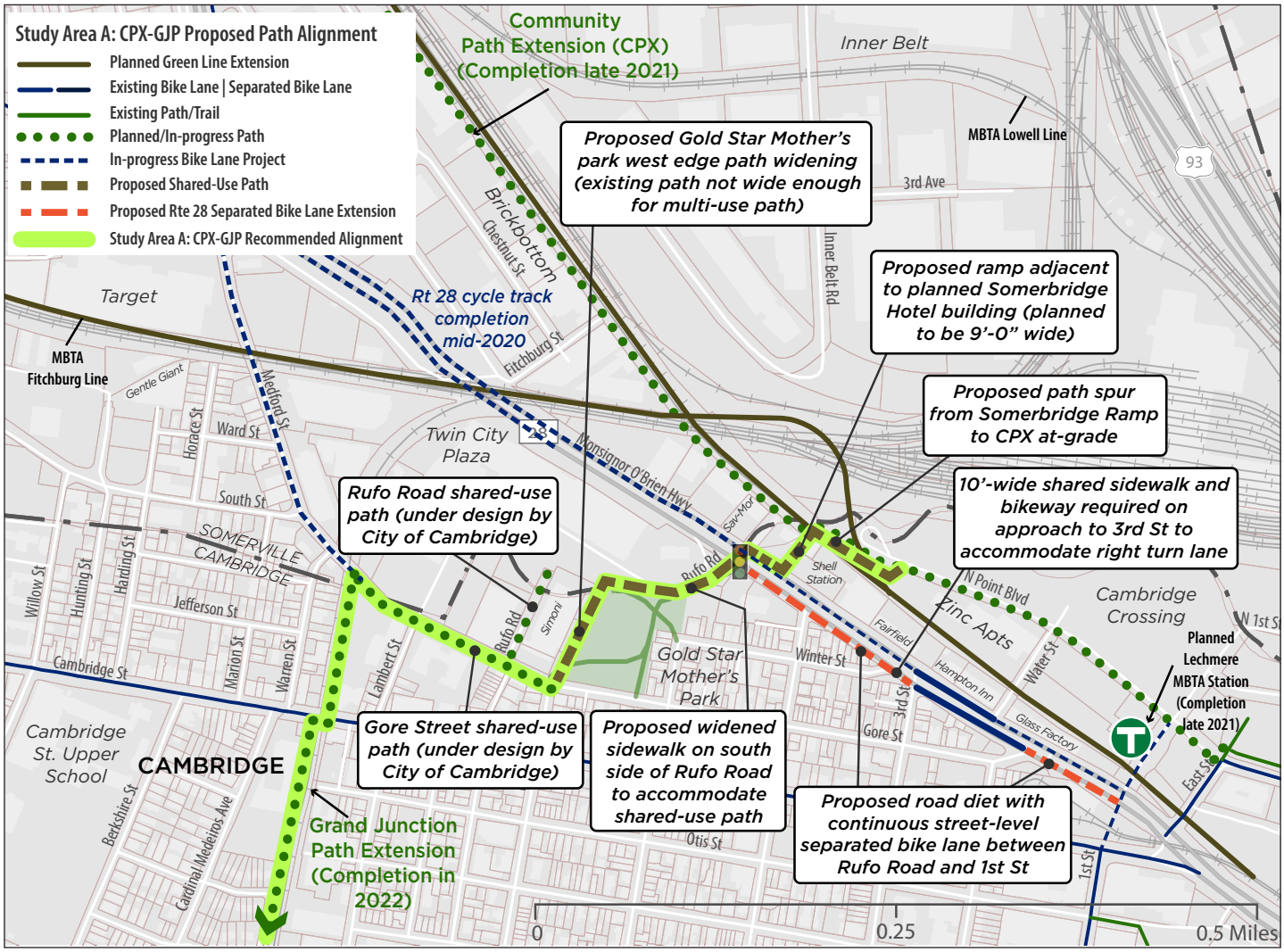
03. RECOMMENDATIONS

3.1 Study Area A: Grand Junction Path - Community Path Extension Connection

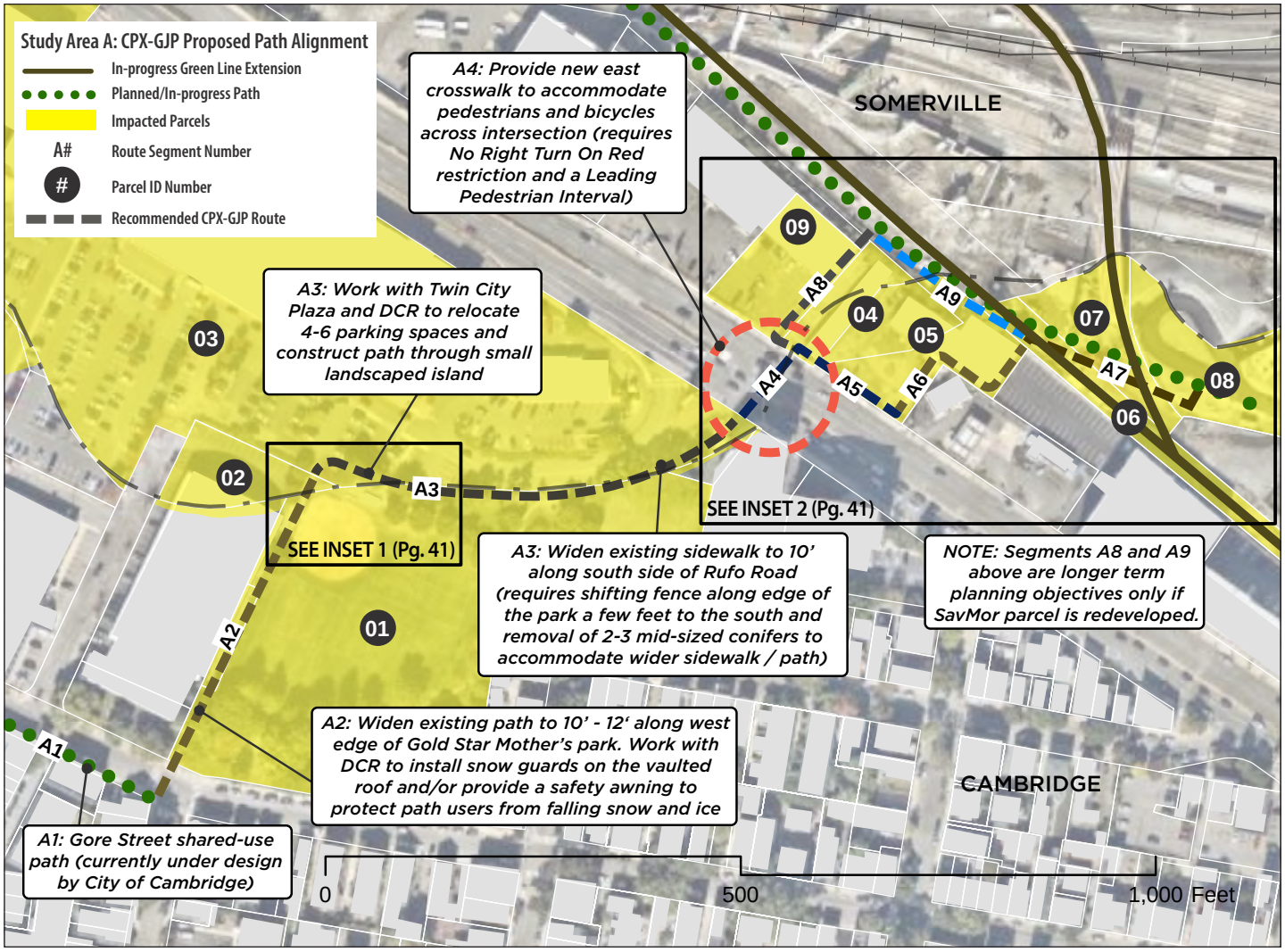
Following public input and consultant team analysis of the alternatives of the three route options proposed in Chapter 2 of this report, a final recommended alignment was chosen to provide connectivity between the Grand Junction Path (GJP) and the Community Path Extension (CPX). The recommended alignment is outlined in detail in the map graphic below, and in the detailed inset maps and tables on the following pages.

A comfortable shared-use path facility within Study Area A requires some creative thinking and the need to engage with multiple stakeholders, including the City of Cambridge, DCR, MassDOT and private property owners. The primary alignment borrows heavily from Option A1 in Chapter 2 but includes a new recommended route along the east side of Simoni Rink. This will require coordination with DCR to ensure falling snow from the vaulted roof does not create a hazard and input on park path widening. The route will complement the City of Cambridge's Gore Street project which includes a shared use path along the south end of Rufo Road (between the roadway and head-in parking) that provides a walking and bicycling route to Stop & Shop. Beyond Gold Star Mother's Park, the recommended route includes a spur along Route 28 to improve bike connections to the Lechmere MBTA station.

STUDY AREA A: FINAL RECOMMENDED ROUTE MAP



STUDY AREA A: IMPACTED PARCELS AND RECOMMENDED ROUTING MAP



STUDY AREA A RECOMMENDED ROUTE: IMPACTED PARCELS TABLE

MAP ID	USE	SITE ADDRESS	LOT SIZE	OWNER SHIP	OWNER	OWNER ADDRESS	NOTES
01	930	123 Gore St	3.93 acres	Public	City of Cambridge	57 Inman St, Cambridge, MA	Gold Star Mother's Park
02	920V	Rufo Rd	0.32 acres	Public	Comm of Mass	1 Ashburton Pl, 15th Fl, Boston, MA	DCR-owned. Simoni Rink, Somerville portion
03	3230	22 McGrath Hwy	11.75 acres	Private	Twin City Plaza LLC	PO Box 790830, San Antonio, TX	Twin City Plaza parking lot
04	3350	1 McGrath Hwy	0.37 acres	Private	Anthony Previte	153 Russell Ave, Watertown, MA	Recently purchased by Somerbridge Hotel Site
05	316	263 Monsignor O'Brien Hwy	0.37 acres	Private	Anthony Previte	153 Russell Ave, Watertown, MA	Recently purchased by Somerbridge Hotel Site
06	975	# Monsignor O'Brien Hwy	0.66 acres	Public	MBTA	10 Park Plaza, Boston, MA	GLX site
07	975	# Charlestown Ave	0.35 acres	Public	MBTA	10 Park Plaza, Boston, MA	GLX site
08	013	32R Charlestown Ave	21.88 acres	Private	DW NP Property, LLC	575 Market Street, San Francisco, CA	GLX site
09	3220	13-15 McGrath Hwy	0.37 acres	Private	Laben Realty LLC	15 McGrath Hwy, Somerville, MA	SavMor Liquors retail store

Source: https://docs.digital.mass.gov/dataset/massgis-data-standardized-assessors-parcels

STUDY AREA A RECOMMENDED ROUTE: DETAILED ROUTE SEGMENTS TABLE

ID	STREET NAME / LOCATION	FACILITY TYPE	LENGTH	PHASING* | NOTES	OWNER	COST**
A1	Gore Street	Shared-Use Path	860 ft	**Short Term** | Funded, designed, and to be constructed by City of Cambridge.	City of Cambridge	N/A (by others)
A2	Gold Star Mother's Park	Shared-Use Path	430 ft	**Mid Term** | Cost assumes removal of existing pathway and a replacement with new sub-base and asphalt. Requires coordination with DCR to install snow guards on vaulted Simoni Rink roof or other engineering solution to protect path users. Cost does not include snow guard materials costs nor installation of snow guards.	City of Cambridge	$170,000
A3	Twin City Plaza / Rufo Road south sidewalk	Shared-Use Path	560 ft	**Mid Term** | Work with Twin City Plaza LLC owners to remove / relocate 4 to 5 parking spaces indicated in diagram on following page; includes removal of portions of sidewalk and three trees. Includes 500' of asphalt path and 63' of concrete sidewalk.	Twin City Plaza LLC	$270,000
A4	McGrath Highway / Route 28	Crosswalk	110 ft	**Mid Term** | Construct new crosswalk and curb ramps, and install pedestrian signal heads at Rufo Road / McGrath Highway intersection. Includes new curb ramps and pedestrian signals on both intersection quadrants.	MassDOT	$97,000
A5	McGrath Highway / Route 28	Shared-Use Path	140 ft	**Mid Term** | New sidewalk-level shared-use path in front of planned Somerbridge Hotel site to be completed by developer.	MassDOT	N/A (by others)
A6	Somerbridge Hotel ramp	Ramp	230 et	**Mid Term** | Somerbridge hotel developers proposed path. Path is planned to be approximately 9'-0" wide with two 90-degree turns along the eastern edge of the parcel.	Somerbridge Hotel, LLC	N/A (by others)
A7	Location between top of granite retaining wall and elevated CPX viaduct / CPX at-grade / MBTA Access Road	Shared-Use Path	280 ft	**Mid Term** | Coordination with MBTA / GLX and CPX design teams is needed to ensure shared-use path routing is not precluded by ongoing GLX and CPX construction.	MBTA	$110,000
A8	SavMor parcel pedestrian/bicycle ramp	Ramp	170 ft	**Long Term** | If Sav-Mor parcel is redeveloped, establish new pedestrian / bicycle ramp from Route 28 at Rufo Road intersection to top of retaining wall (to be negotiated in the future).	Laben Realty, LLC	N/A (by others)
A9	Location between top of granite retaining wall at SavMor parcel and A7 Shared-Use Path	Shared-Use Path	250 ft	**Long Term** | Includes approx. 30' long x 12' wide prefabricated bridge to span gap at corner of retaining wall; coordination with GLX and CPX design teams is needed to ensure shared-use path routing is not precluded by ongoing GLX and CPX construction.	MBTA	$370,000
		Total Length:	*3,030 feet*			$1,020,000

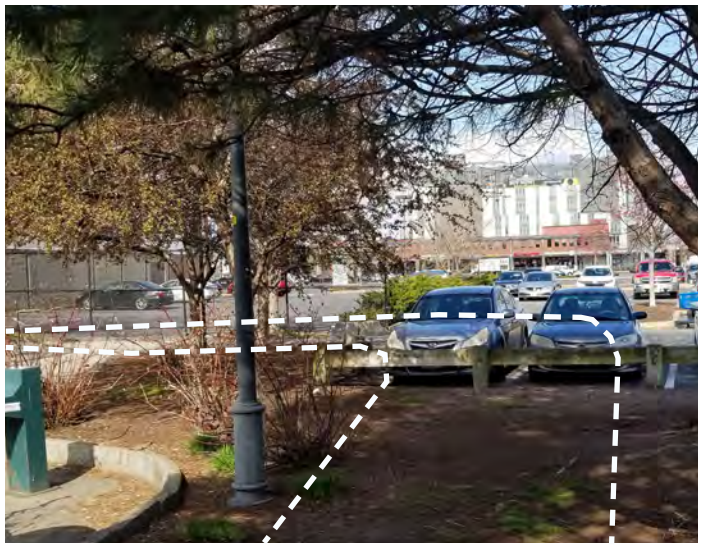
*Phasing options: Short Term, 1-2 years; Mid Term, 3 - 7 years; Long Term, >8 years.

**Order of magnitude cost estimates include 30% contingency and inflation based on anticipated project phase

STUDY AREA A RECOMMENDED ROUTE: AREA PHOTOS

A1: A City of Cambridge rendering showing the proposed shared-use path on Gore Street from the public meeting / presentation in spring 2019. The path is part of the formal recommendation for the CPX-GJP Study Area A alignment.

A2: Path along the west side of Gold Star Mother's Park can be widened to support a multi-use path (engineered solution to falling snow and ice from roof required)

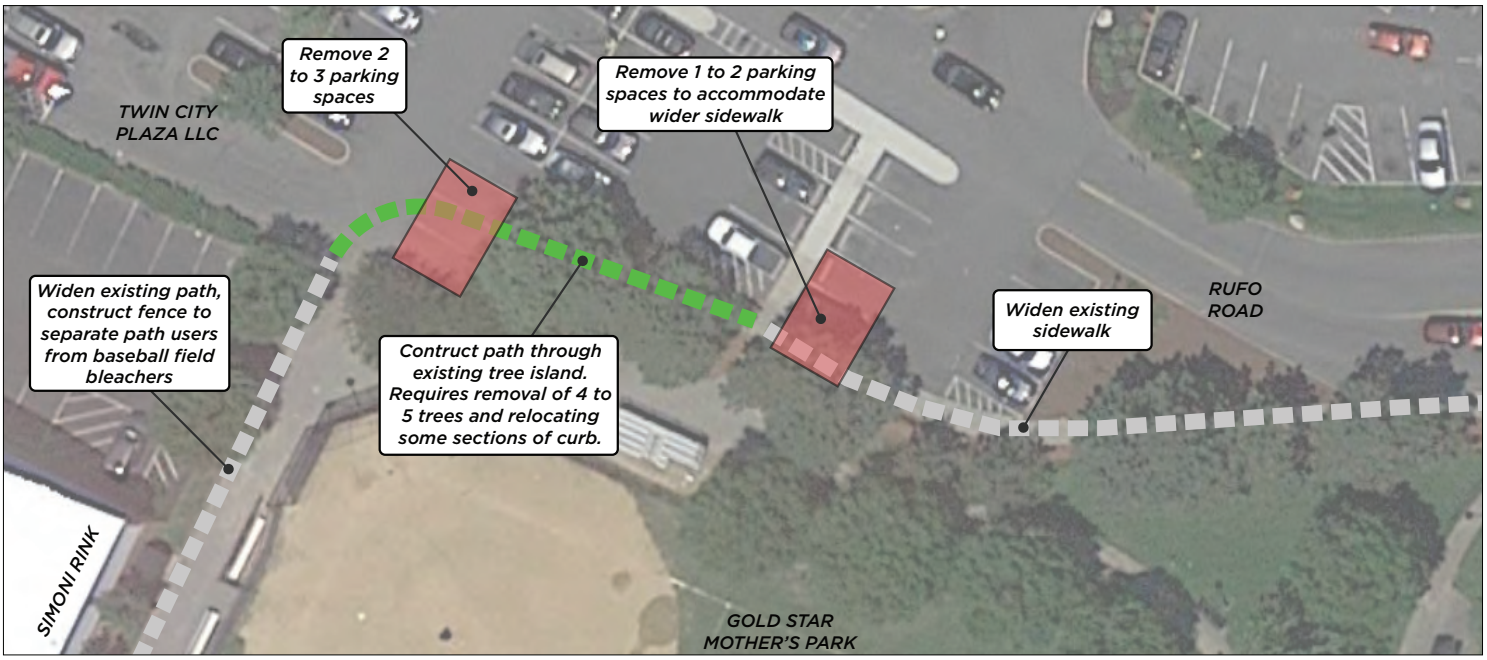


A3: A handful of parking spaces can be re-purposed to support a shared-use path through the landscaped island between the parking area and the park

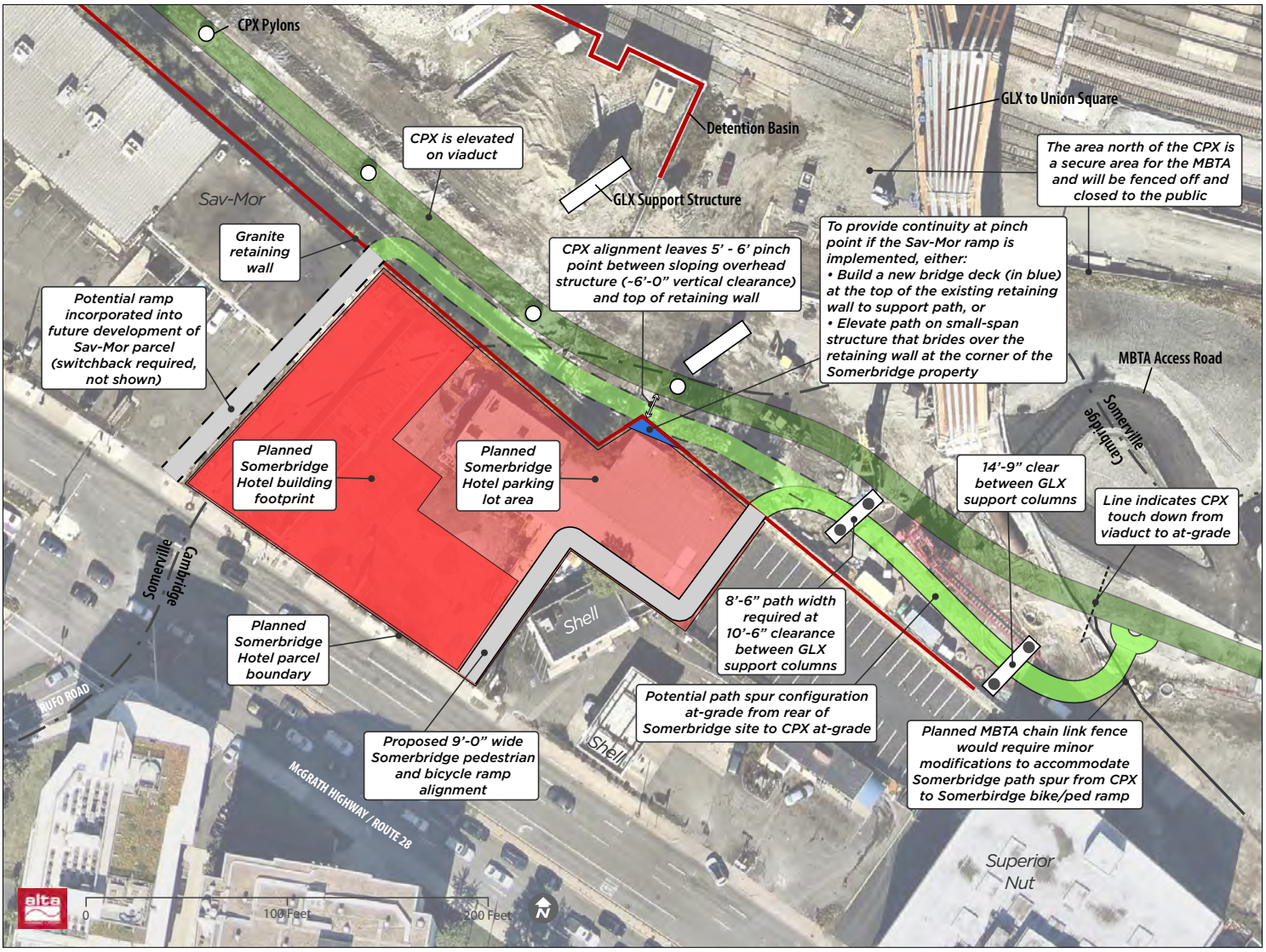
A3: The sidewalk on the south side of Rufo Road can be widened to accommodate a shared-use path

A4: The recommended route will use a new east crosswalk (right side of photo) to cross Route 28 at the Rufo Road intersection

STUDY AREA A INSET MAP 1: ROUTING BETWEEN GSM PARK WEST PATH AND RUFO ROAD SIDEWALK



STUDY AREA A INSET MAP 2: ROUTING BETWEEN ROUTE 28 AND THE COMMUNITY PATH EXTENSION



3.2 Study Area B: Mystic River Greenway - Community Path Extension Connection

Following public input and consultant team analysis of the alternatives of the three route options proposed in Chapter 2 of this report, a final recommended alignment was chosen to provide connectivity between the Mystic River Greenway (MRG) and the Community Path Extension (CPX). The recommended alignment is outlined in detail in the study area map, inset maps and table below, and in the detailed inset maps and tables on the following pages.

Creating a feasible shared-use path facility within Study Area B, with the exception of New Washington St., requires the use of an underutilized portion of a state-owned rail corridor adjacent to the MBTA Orange Line, used primarily for the storage of freight cars. Reaching out to MassDOT, the MBTA, PanAm, Amtrak, and other rail operators may be required in order to fully understand their requirements for the use of a short stretch of tracks in the area of Crafts, Brighton, and Perkins Streets. This study recognizes the opportunity to route a path along this corridor with the provision to allow those operators to use other track space for storing, turning around, and de-coupling locomotives. (See Appendix for a more detailed memorandum describing opportunities to relocate freight train storage elsewhere in the immediate area.)

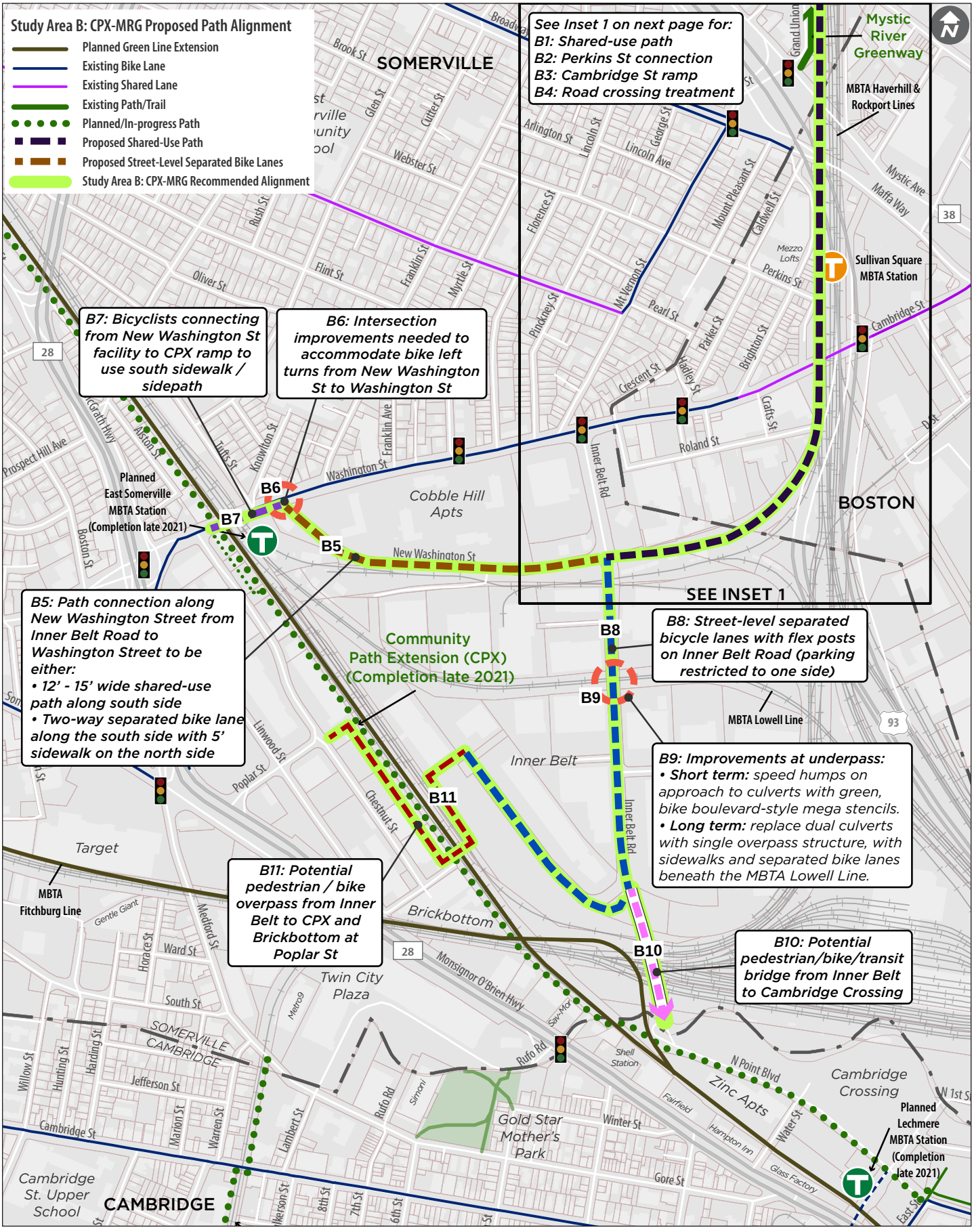
STUDY AREA B RECOMMENDED ROUTING: IMPACTED PARCELS TABLE (See maps on the following pages)

MAP ID	USE CODE	SITE ADDRESS	LOT SIZE	OWNER SHIP	OWNER	OWNER ADDRESS	NOTES
*01	--	Somerville	--	Public	Comm of Mass	--	--
02	Exempt	Boston	1.29 acres	--	Comm of Mass	Charlestown, MA	
03	Exempt	Boston	4.1 acres	Public	MBTA	Charlestown, MA	
04	Exempt	Boston	3.14 acres	Public	MBTA	Charlestown, MA	
05	Exempt	Boston	0.61 acres	Public	MBTA	Charlestown, MA	
06	Exempt	Boston	0.4 acres	Public	MBTA	Charlestown, MA	
07	Exempt	Somerville	5.28 acres	Public	MBTA	10 Park Plaza, Boston, MA	

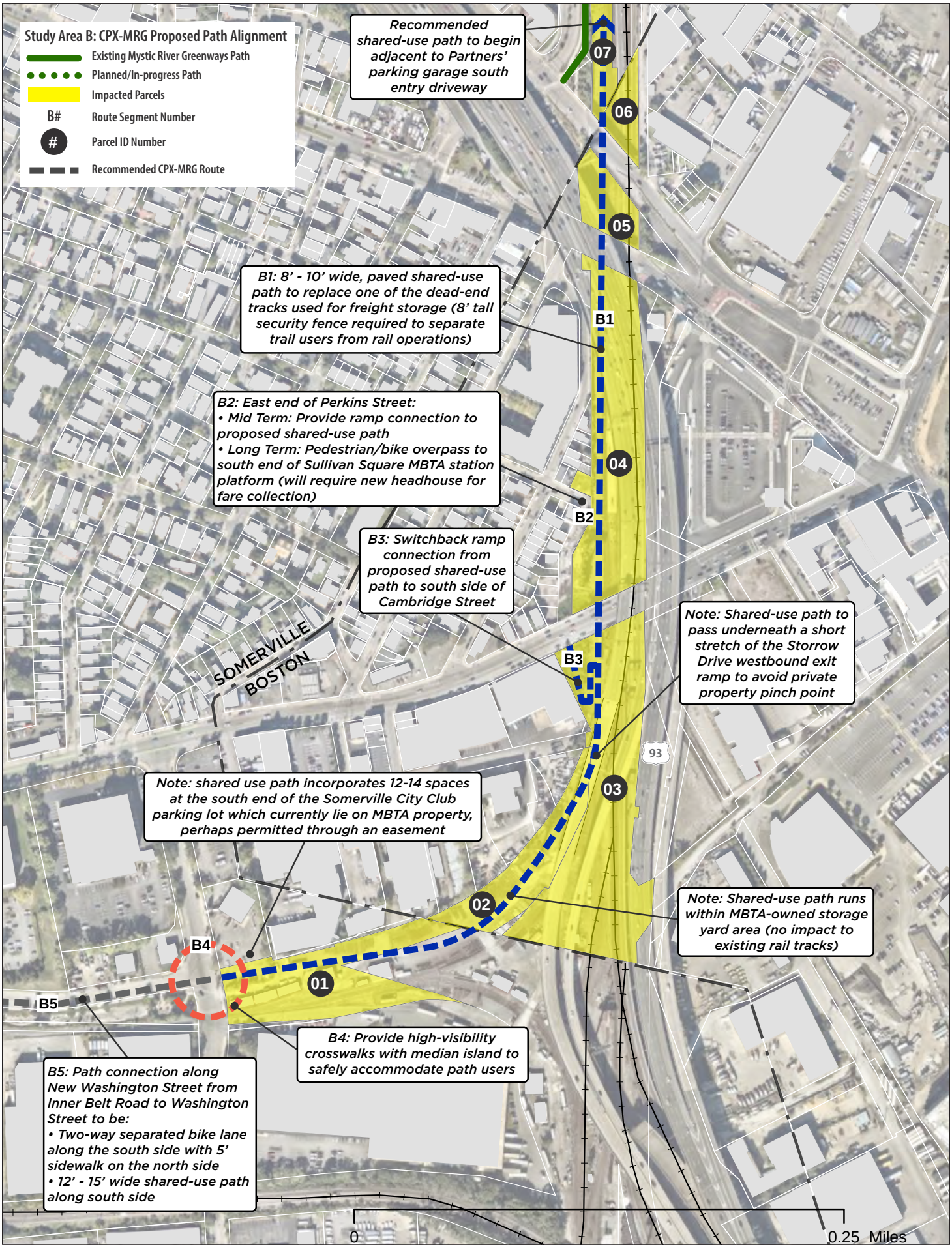
*No information or data available for this parcel

Source: https://docs.digital.mass.gov/dataset/massgis-data-standardized-assessors-parcels

STUDY AREA B: FINAL RECOMMENDED ROUTING MAP



STUDY AREA B: IMPACTED PARCELS AND RECOMMENDED ROUTING MAP (Inset Map 1)



STUDY AREA B RECOMMENDED ALIGNMENT: DETAILED ROUTING SEGMENTS TABLE

ID	STREET NAME / LOCATION	FACILITY TYPE	LENGTH	PHASING* | NOTES	OWNER	COST**
B1	Rail right-of-way	Shared-use path	3,170 ft	**Mid Term** | Shared-use path within existing rail right--of-way that is seldom used for freight storage. Cost estimate does not include removal/disposal of tracks and railroad ties; includes 8' tall vinyl-coated chain link fence with top rail between the existing RR track and proposed path. Assumes existing fence to remain.	MBTA	$1,480,000
B2	Perkins St	Ramp	--	**Mid Term** | Path to Perkins Street to include switchback and retaining wall to accommodate the 5'-7' of grade change; pedestrian railing included in estimate. Ramp to be constructed on fill-type retaining wall at 8' wide with one switchback with a max grade of 5%. Includes asphalt path extension from existing north-side sidewalk on Perkins St.	MBTA	$580,000
	Perkins St	Ped/Bike overpass, new MBTA head house	--	**Long Term** | Pedestrian/bike overpass and new MBTA Orange Line headhouse required ongoing negotiations to determine program and scope.	MBTA	Long term project, cost unknown
B3	Cambridge St	Ramp (optional project)	310 ft	**Mid Term** | Ramp to be constructed on fill-type retaining wall at 8' wide with several switchbacks for 500' at max grade of 5%. Includes pedestrian railing to be placed on proposed retaining wall.	MBTA	$7,420,000 (optional project)
B4	Inner Belt Rd at New Washington St	High visibility crosswalk and median refuge island	80 ft	**Mid Term** | Cost estimate includes raised, concrete pedestrian refuge island, 4 RRFB's, new curb ramps, and high visibility pavement markings for the crosswalk.	City of Somerville	$210,000
B5	New Washington Street	Two-way separated bike lane + sidewalk	1,660 ft	**Mid Term** | Two-way separated bike lane with raised median buffer and 5' sidewalk on the opposite side. Requires restriction of parking to one side. (Other option: shared-use path on south side).	City of Somerville	$1,060,000
B6	New Washington St at Washington St	Intersection improvements	--	**Mid Term** | Left turn improvements needed to be determined with input from City of Somerville	City of Somerville	TBD
B7	Washington St	Sidewalk / sidepath	310 ft	**Mid Term** | From CPX ramp to New Washington St; completed as part of GLX project	City of Somerville	N/A (by others)
B8	Inner Belt Rd	Separated bike lanes	2,800 ft	**Mid Term** | From New Washington St to the end of the right-of-way. Cost assumes roadway striping and flex-posts only.	City of Somerville	$105,000
B9	Inner Belt Rd underpass beneath MBTA Lowell Line	Short term: speed humps and mega sharrows.	--	**Short Term** | Cost estimate include 4" high speed bumps with stencils and large-scale, green-back sharrows. Does not include drainage improvements.	City of Somerville	$22,000
	Inner Belt Rd underpass beneath MBTA Lowell Line	Long term: bridge replacement and separated bike lanes / widened sidewalks.	--	**Long Term** | When dual culverts approach end of useful life, involve MassDOT, MBTA, City of Somerville, and Friends of groups from concept planning to final design.	City of Somerville (below), MBTA (above)	Long term project, cost unknown
B10	Bridge over tracks to commuter rail maintenance facility	Pedestrian / bike / transit only bridge	600 ft	**Long Term** | Long term project to link Inner Belt with Cambridge Crossing	Cities of Somerville and Cambridge, MBTA, Cambridge Crossing	TBD - Multi-million dollar long term project
B11	End of Inner Belt Rd to intersection of Poplar St at Chestnut St	Bike / pedestrian bridge	1,600 ft	**Long Term** | Long term project to link Inner Belt with Brickbottom.		
		Total length:	*10,530 ft*	Total cost estimate:		$2,700,000
				Cost estimate for optional B3 ramp:		$7,420,000

*Phasing options: Short Term, 1-2 years; Mid Term, 3 - 7 years; Long Term, >8 years

**Order of magnitude cost estimates include 30% contingency and inflation based on anticipated project phase

STUDY AREA B RECOMMENDED ROUTING: AREA PHOTOS

B1: Much of the recommended shared-use path will replace the freight storage tracks on the west (right) side of the ROW. (Image: Deniz Karakoyunlu.)

B2: While construction of the shared-use path could also include a ramp connection to the edge of Perkins Street (at far left), in the longer term an overpass linking path users and the neighborhood to the Sullivan Square MBTA station should be considered (Image: Deniz Karakoyunlu)

B5: Improvements along New Washington Street are anticipated to include a two-way, street level separated bike lane with a sidewalk level shared-use path as an option. (Image: Google streetview)

B9: Proposed speed humps, stencils, and a replacement overpass in the long term will improve access and comfort through the existing culverts (Image: Google streetview)

B10: The potential pedestrian / bike / transit bridge may look something like the bridge designs used for the CTfastTrak Bus Rapid Transit project in Hartford, Connecticut (Image: Google streetview)

B11: The potential pedestrian/bike overpass can link Poplar Street (in Brickbottom neighborhood) to Inner Belt

3.3 Funding Sources

Shared-use paths and trails are often funded utilizing a combination of local, state, federal, and private sources. Many funding programs require a minimum local match (e.g., 80% federal funds, 20% local.) In many instances, communities have successfully leveraged grant money from private foundations or state programs as the designated "local" match for other funding sources. Land donations or time / materials / labor provided by the City of Somerville or Cambridge or Boston may be permissible as the local match per some specific funding programs.

Stakeholders in making these path connections should consider working with the abutting cities and landowners to pursue a variety of funding sources. Over reliance on one funding source runs the risk of an incomplete path project as political leaders rotate in or out of office. The following list gives a summary of the major funding programs that should be considered for the CPX connections.

FEDERAL TRANSPORTATION BILL

The U.S. Congress appropriates funding for federal greenway and trail construction projects every five years. The federal transportation bill has been the primary source for greenway construction money in the last few years. Various funding programs within the legislation relate to trails and paths. The current iteration of the federal transportation bill is Moving Ahead for the 21-st Century (MAP-21). MAP-21 provides funding for trails and other active transportation projects within the Transportation Alternatives section of the bill. These funds are programmed through the Massachusetts Transportation Improvement Program (TIP). The Boston region Metropolitan Planning Organization (MPO) revises the TIP each year.

SURFACE TRANSPORTATION PROGRAM

The Surface Transportation Program (STP) provides flexible funding that may be used by States and municipalities to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel project, as well as for projects on any pubic road (except locally-owned roads and rural minor collectors), pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.

The Federal share is governed by 23 United States Code (U.S.C.) 120. It is generally 80%, subject to the upward sliding scale adjustment for States containing public lands. 50% of a state's STP funds are to be distributed to areas based on population with the remainder to be used in any area of the state. A portion of funds is reserved for rural areas to be spent on rural minor collectors.

CONGESTION MITIGATION AND AIR QUALITY IMPROVEMENT PROGRAM

The Congestion Mitigation and Air Quality Improvement Program (CMAQ) provides federal funding for states to support projects and programs intended to improve air quality and reduce traffic congestion. CMAQ funds (80% federal / 20% non-federal) are used for transportation programs and projects that will contribute to the attainment of a National Ambient Air Quality Standard in ozone, small particulates and carbon monoxide non-attainment areas. As defined by federal regulations and guidance, examples of projects eligible for CMAQ funding include:

- Bicycle and pedestrian facilities and programs
- Traffic flow improvements

TRANSPORTATION ALTERNATIVES PROGRAM

The Transportation Alternatives Program (TAP) is a competitive grant program created under MAP-21. TAP provides funding for a variety of transportation project types, including projects that would previously have been eligible for funding under separate programs: the Transportation Enhancements, Recreational Trails, and Safe Routes to School programs.

Fifty percent of TAP funds in Massachusetts are reserved for urban areas with populations over 200,000. The MPO controls these funds.

TAP funds may be used for:

- Planning, design, and construction of on-road and off-road trail facilities for pedestrians, bicyclists and other non-motorized forms of transportation (including sidewalks, bicycle infrastructure, pedestrian and bicycle signals, traffic calming techniques, lighting and other safety-related infrastructure, and transportation related projects to achieve compliance with the Americans with Disabilities Act of 1990)
- Planning, design, and construction of infrastructure-related projects and systems that provide safe routes for non-drivers (including children, older adults, and individuals with disabilities) to access daily needs
- Vegetation management management practices in transportation rights-of-way to improve roadway safety, prevent against invasive species, and provide erosion control
- Construction of infrastructure-related projects in the vicinity of schools that improve the the ability of students to walk and bike to school including sidewalks, shared use paths, bike facilities and traffic calming projects

As with other projects, the proponent for a TAP project would be responsible for project design and for completing the right-of-way acquisition and clearance process.

RECREATION TRAILS PROGRAM (RTP) FUNDING

Federal Highway Administration grants administered locally by the the Department of Conservation and Recreation are available for up to $50,000 that can be used for recreational projects such as trails, or up to $100,000 if that project can be shown to impact multiple communities. RTP is a reimbursement program however, so the project would need to be funded by a local funding source for reimbursement upon completion. Grants are reviewed and awarded in partnership with the statewide Massachusetts Recreational Trails Advisory Board (MARTAB). The next round of annual application due dates can be found here: https://www.mass.gov/orgs/massachusetts-recreational-trail-advisory-board-martab.

MASSTRAILS FUNDING

MassTrails is the lead grant funder for this Feasibility Study. MassTrails is an inter-agency initiative of the Commonwealth lead by the Governor's Office, Executive Office of Energy and Environmental Affairs, Department of Transportation and the Department of Conservation and Recreation.

MassTrails provides grants to support recreational trail and shared use pathway projects across the Commonwealth. Grant amounts are dependent on the project and its needs, but generally range from $5,000

to $100,000 with grants of up to $300,000 awarded to projects demonstrating critical network connections of regional significance.

Eligible grant activities include project development, design, engineering, permitting, construction, and maintenance of recreational trails, shared use pathways, and the amenities that support trails. https://www.mass.gov/welcome-to-masstrails.

MASSDOT COMPLETE STREETS FUNDING

MassDOT's Complete Streets program is a three-tiered program that offers planning and implementation funds subsequent to the adoption of a Complete Streets policy by the local community (Tier 1.) After completion of a Complete Streets Prioritization Plan (Tier 2), MassDOT will provide up to $400,000 per year for up to five years (Tier 3) to implement the projects within the approved Prioritization Plan.

The Friends of groups should work with the cities of Somerville, Cambridge, and Boston to request specific CPX connection projects be added to the Complete Streets Prioritization Plan.

PRIVATE FUNDING

Massachusetts is fortunate to have a few private Foundations that are keenly interested in promoting outdoor recreation and public health, and have a track record funding open space and greenway trail projects. In particular, both the Barr Foundation and the Solomon Foundation, have provided funding for both final design and construction of sustainable transportation, parks and trail projects in various communities within the Commonwealth. Both are very collaborative in their approach with an emphasis on public engagement that could dovetail well with the effort to connect the CPX to the Grand Junction Path and the Mystic River Greenways.

The Solomon Foundation helped to underwrite the design and construction of the shared use path along Greenough Blvd. in Cambridge and Watertown

3.4 Conclusion & Next Steps

This report shows that linkages from the Community Path Extension to the nearby Grand Junction Path Extension and the Mystic River Greenway are possible but will require additional coordination with state and local agencies and proportionate fundraising. Providing these connections will require concerted effort over a multi-year period—with some segments likely taking over a decade to design, permit and fund—but the payback will be quite significant for the region. Concentrated in an area less than a square mile, the shared-use path connection recommendations will help tie together dozens of miles of paths, trails and greenways. From a regional perspective, seamless connectivity in the two study areas will help link Bedford/Concord to Kendall Square, the Mystic and Malden River Greenways to the Charles River Basin paths extending from Boston to Waltham, and Minuteman Path users to downtown Boston.

The following Next Steps provide a high-level roadmap for the Friends of the Community Path and the Friends of the Mystic-to-Charles Connector to make these connections a reality.

STUDY AREA A: NEXT STEPS

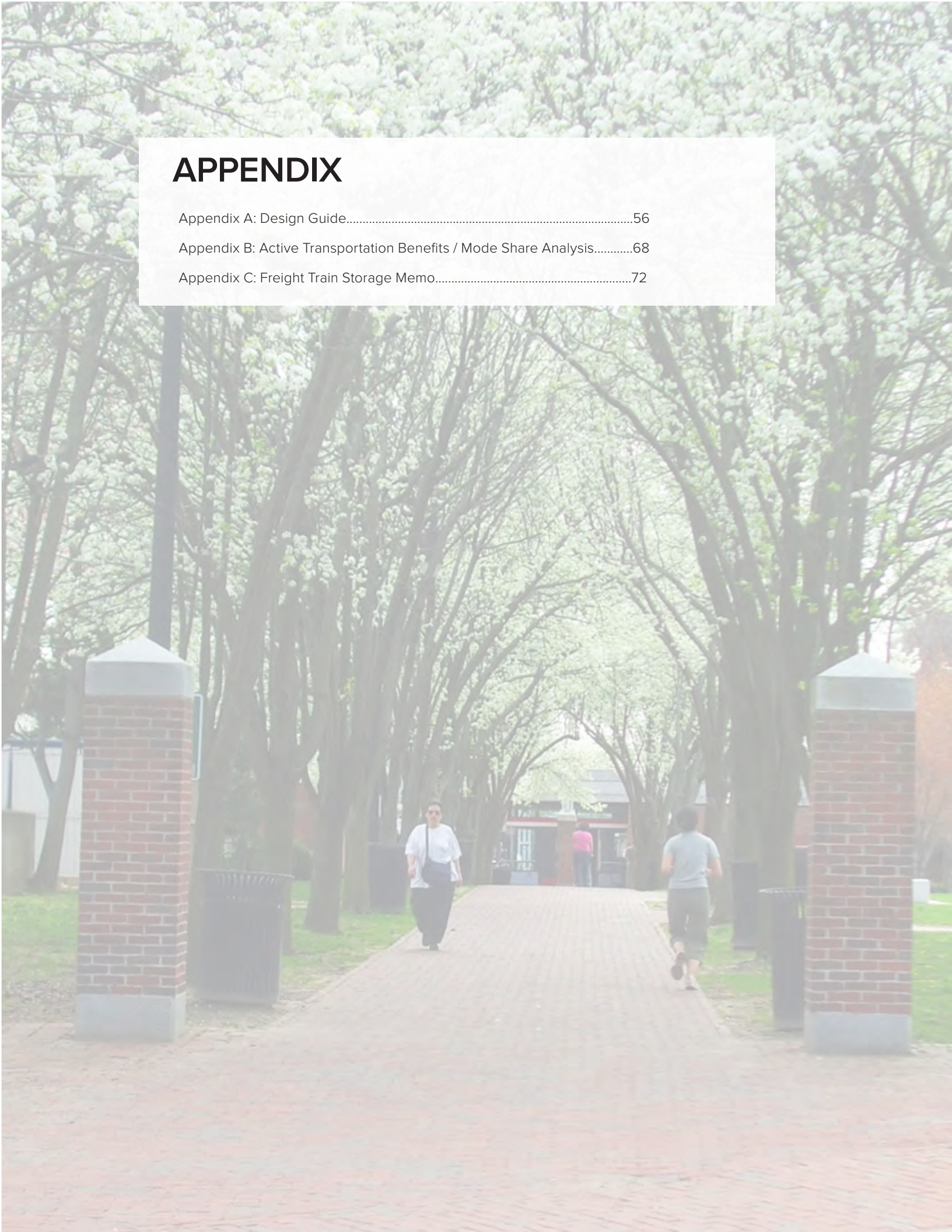
NEXT STEP	ADDITIONAL SUPPORT FROM
Continue to coordinate with the Cities of Cambridge and Somerville Planning and Zoning staff and the developer to ensure the Somerbridge Hotel project includes the connecting ramp from Rt 28 to the top of the retaining wall.	Somerville Bicycle Committee and Cambridge Bicycle and Pedestrian Advisory Committees
Ensure on-going communications with MassDOT and the MBTA's GLX Team to ensure space is available on MBTA property to accommodate the path connection from the top of Somerbridge Hotel ramp to the CPX	City of Somerville; City of Cambridge
Work with Cambridge Community Development Department, Parks and Playgrounds Division to ensure a high level of comfort with routing a shared use path along the west edge of Gold Star Mothers Park; work with both Parks and Playgrounds and DCR to devise a plan to protect path users from falling snow and ice from the ice rink roof	Cambridge Bicycle and Pedestrian Advisory Committees
Meet with Twin City Plaza property owners and Stop & Shop to get buy-in on path recommendations that impact a small portion of the parking lot	City of Somerville
Coordinate with MassDOT on the installation of a new path crossing at the east leg of the Route 28/Rufo Road intersection; discuss opportunities to provide an extension of the separated bike lanes on Route 28 to provide bike connections from the Rufo intersection to the Lechmere MBTA Station	Somerville Bicycle Committee and Cambridge Bicycle Advisory Committees
Seek funding through the variety of sources available, some of which are included in the Feasibility Study Report; seek letters of support from a variety of elected officials, municipal agencies and advocacy organizations (ped/bike and neighborhood)	Mayors, City Councilors, DCR, City Planning Departments, Advocacy Groups, and other stakeholders

STUDY AREA B: NEXT STEPS

NEXT STEP	ADDITIONAL SUPPORT FROM
Assemble a coalition of path supporters that will be needed to encourage MassDOT and the MBTA to allow the vacating of one of the two rail lines within the right of way adjacent to the MBTA Orange Line tracks from approximately Roland St to Grand Union Blvd at Mystic Ave. This would provide the minimum space for the path to continue from the Partners' parking structure into the Inner Belt area; also requires discussion with the MBTA about an easement through the storage yard that sits just north and east of Yard 10 Lead crossing of Inner Belt Road	Friends of the Mass Central Rail Trail, Friends of the Grand Junction Path, Friends of the Mystic-to-Charles Connector, and other advocacy groups and stakeholders
Work with the City of Somerville's upcoming Bicycle Master Plan effort to ensure that on-street bikeway recommendations (e.g. separated bike lanes along New Washington St and Inner Belt Rd) are incorporated in the future bike network	Somerville Department of Strategic Planning and Community Development
Meet with the City of Cambridge Community Development Department to plan for the long-term opportunity to provide a pedestrian/bicycle/ transit bridge from Inner Belt Rd to the MBTA Access Rd turn-around near Cambridge Crossing; requires coordination with the MBTA regarding the crossing of GLX and commuter rail tracks	Somerville Department of Strategic Planning and Community Development; DivCo West and nearby Inner Belt property owners
Coordinate with the Boston Planning and Development Agency's Charlestown planning lead to gauge level of interest in providing connections from the potential rail-corridor trail to locations at the western edges of Charlestown (e.g. ramps to Perkins Street and Cambridge Street)	Charlestown Neighborhood Organization and other local organizations
Seek funding through the variety of sources available, some of which are included in the Feasibility Study Report; seek letters of support from a variety of elected officials, municipal agencies and advocacy organizations (ped/bike and neighborhood)	Broad coalition to be assembled

Existing Community Path in Somerville: With connections to downtown Boston and elsewhere, the Community Path Extension will provide a pedestrian/bike facility for a wide range of community members in all seasons (photo credit: Alan Moore)

APPENDIX



APPENDIX A

Design Guidelines

This Shared Use Path Design Guide is intended to be used as a toolkit for Somerville and Cambridge planning and engineering staff in addition to officials from Massachusetts Department of Transportation. The toolkit will help local planners, engineers, and active transportation advocates choose the most desirable and appropriate walk or bicycle facility for a given context to improve comfort along the CPX / MRG / GJP connection. The toolkit includes important details to consider when creating safer on- and off-street path connections for users of all ages and abilities.

Another goal is to help bring consistency to the design of bicycle and pedestrian facilities across municipal boundaries. The Guide includes physical environment recommendations and design considerations for a variety of on- and off-street corridor types, and includes intersection and street crossing improvements.

The Guide is not intended to impose inflexible standards, but instead, to offer consistent guidance on what can sometimes be challenging design and engineering options.

The guidelines are not a substitute for a more thorough evaluation by engineers or landscape architects, however. They are general in nature and further analysis and professional engineering judgment will be required per local conditions (topography, cost, right of way constraints) and community concerns. Most importantly, the Guide is intended to complement other state and national design manuals that provide a higher-level of detail for proposed pedestrian and bicycle improvements. These include:

- MassDOT Separated Bike Lane Planning & Design Guide (2015)
- The Federal Highway Administration (FHWA) Separated Bike Lane Planning and Design Guide (2015)
- The National Association of City Transportation Officials' (NACTO) Urban Streets Design Guide (2013)
- NACTO Urban Bikeway Design Guide (2012)
- American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities (2012)
- AASHTO Guide for the Planning, Design, and operations of Pedestrian Facilities (2004)
- Manual of Uniform Traffic Control Devices (MUTCD) (2009)
- FHWA Rails-with-Trails: Lessons Learned (2002)

The Somerville Community Path (Image: Lynn Weissman)

Off-Street Pedestrian and Bicycle Facilities

SHARED-USE PATH

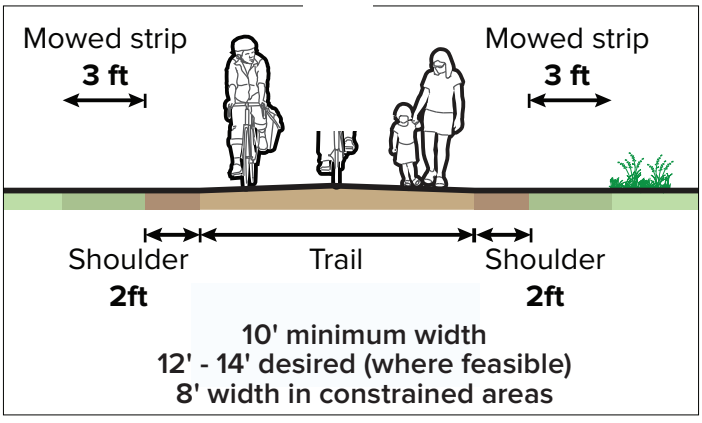
AASHTO guidelines indicate the minimum desired width for a shared-use path is 10 feet, with an acceptable width of 8 feet allowed in constrained areas. Along sections anticipated to draw a high-volume of path users, a width of 12 to 14 feet is more comfortable for the increased number of path users in dense urban areas undergoing residential and commercial redevelopment. Shoulders 2 feet in width should be provided on both sides of the trail. Shoulders should be graded as an extension of the trail surface, to allow trail users to recover if they depart from the trail. The shoulder treatment should be grass or stonedust, depending on local conditions. A mowed vegetative or recreational area three feet wide should be maintained on either side of the trail, extending out from the shoulders. The minimum preferred offset from the trail surface to utility poles and other equipment is 4 feet. When the trail crosses beneath overhead wires, a minimum clearance of 18 feet should be maintained. The trail width should aspire to be 14' paved as much as possible since it will meet all MassDOT conditions and nearly all AASHTO conditions for wider paths:

- High use with a variety of users
- >30% pedestrians
- >300 users per peak hour.

There is a demonstrated need for the ability of bicyclists to pass one another while passing another user, and anticipated heavy use by by skaters, adult tricycles, children, or other users that need more operating width. See latest version of the AASHTO Guide for the Development of Bicycle Facilities for other referenced elements.

Additional considerations include:

- Bridges constructed for the trail will be designed to H-5 loading criteria and signed appropriately.
- Trail entrances should not include bollards. Entrances will be designed to discourage vehicular access while allowing free entry to emergency and maintenance vehicles.
- Signage, lighting, benches, bike racks and other amenities will be located outside the shoulders and in areas which minimize conflicts with utility maintenance access.



Example of a typical shared use path cross section (Image: Empire State Trail Design Guide)

While the paved portion of the Somerville Community Path is 12-feet in width, combined with adjacent softer surfaces for runners, many portions of the path are typically 20' wide.

SHARED-USE PATH ADJACENT TO ACTIVE RAIL (RAIL-WITH-TRAIL)

There are no nationally adopted standards or guidelines that outline specific rail-with-trail facility design. Therefore, guidance to inform standards comes from shared-use path design guides, at-grade railroad street crossing guides, and existing rail-with-trail designs.[2]

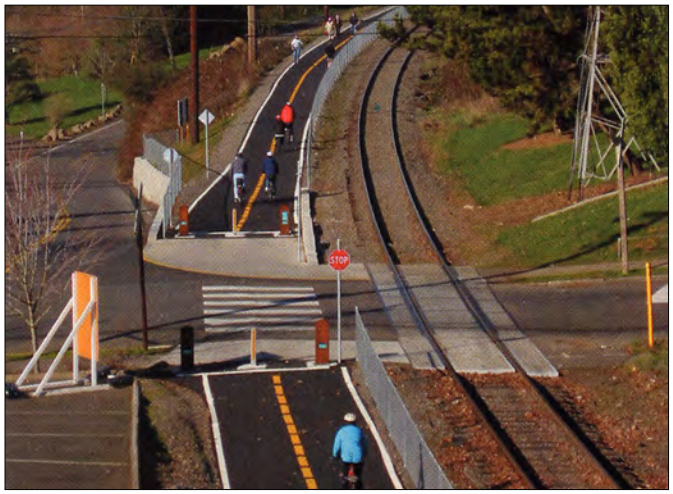
Rail-with-trails must be designed to meet the operational needs of the railroad and the safety and comfort of trail users. It can be challenging to find ways of accommodating both rail and trail uses without compromising safety or function.[3]

Setback

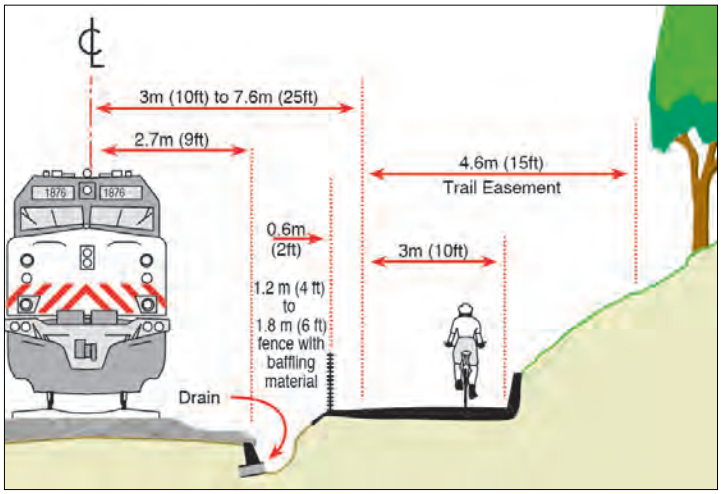
The key item to consider is setback distance. Because there is a lack of consensus on acceptable setback distances, the appropriate distance must be determined on an individual basis.[4]

The trail must be kept outside the "dynamic envelope" of the track, which includes "the clearance required for the train and its cargo overhand due to any combination of loading, lateral motion, or suspension failure."[5] Very narrow setbacks may be acceptable to the railroad and/or trail envelope property owner if:

- Trains are relatively low speed and frequency
- The area has a history of trespassing that might be solved with the introduction of a trail
- The presence of vertical walls or fencing allows for more comfortable rail-with-trail operations



The Springwater Corridor Trail in Portland OR features a 10' setback from the centerline of the tracks



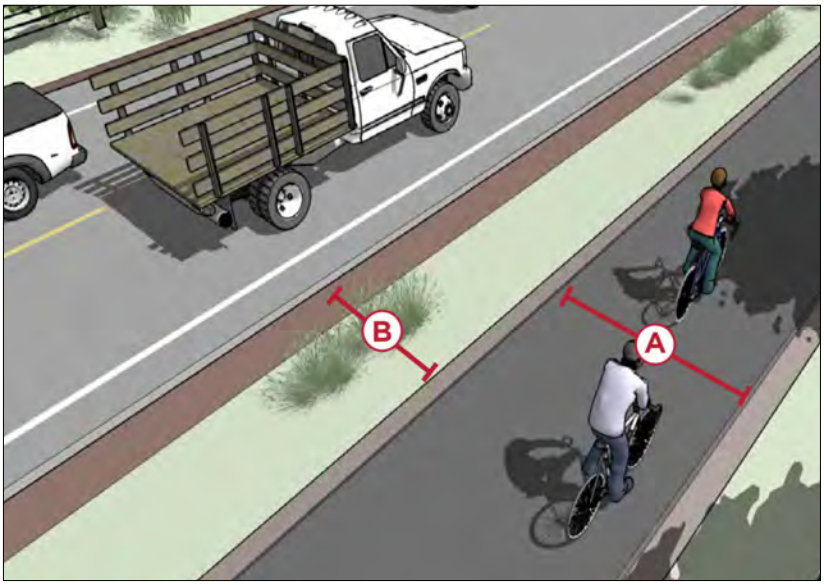
Section showing constrained setback conditions. (Image: FHWA Rails-with-Trails, Lessons Learned, Pg. 65.)

SIDEPATH (SHARED-USE PATH IN STREET RIGHT-OF-WAY)

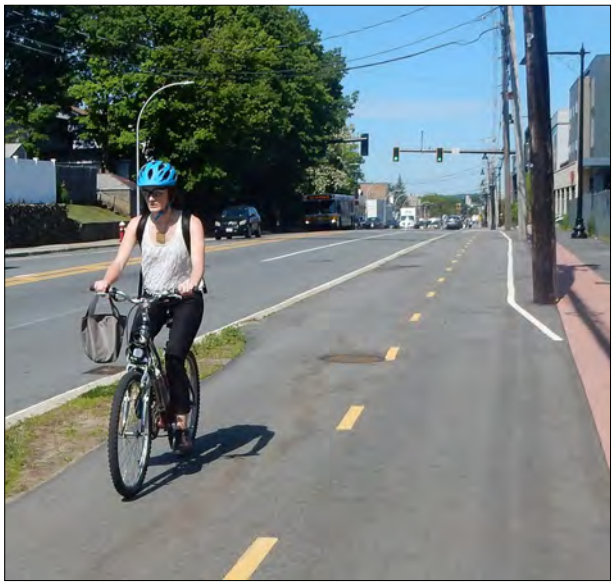
A sidepath is a bidirectional shared-use path located immediately adjacent and parallel to a roadway, typically within the roadway right of way. Sidepaths can offer a high-quality experience for users of all ages and abilities as compared to bicycle or pedestrian facilities within the roadway area. Sidepaths allow for reduced roadway crossing distances and provide comfortable walk connections for shorter distance pedestrian trips.

Additional considerations include:

- Standard sidepath width at locations with mixed pedestrian and bicycle traffic is 10 feet, with 8' allowable in constrained conditions.
- **A:** In constrained areas, the sidepath width can be reduced to 8 feet. *(See corresponding graphic below.)*
- **B**: The preferred minimum roadway separation with is 6.5 feet, with a minimum recommended separation width of 5 feet. Less than 5 feet requires a crash barrier between the path and roadway. *(See corresponding graphic below.)*
- Where private property abuts the road right of way or other issues stand in the way of sidepath development outside the road right of way; a sidepath open to both bicyclists and pedestrians may be developed in the roadway right of way. Flexible delineator posts or other vertical separation should be used in these instances.
- When space is available for a separate facility for pedestrians (min. 5' wide), then a sidewalk-grade separated bicycle lane is an option to accommodate all users



Example of a sidewalk grade sidepath (Image: Hampshire County Complete Streets Design Guide.)



Sidepaths can be designated as multi-use, or defined as bi-directional separated bike lanes

PEDESTRIAN / BICYCLE ACCESS RAMP AND OVERPASS

A pedestrian and bicycle access ramp is used to connect paths to path spurs or other on-street or at-grade facilities. The proposed Somerbridge Hotel site may include a pedestrian and bicycle access ramp from Route 28 / McGrath Highway to the CPX. The ramp is required because of the grade difference evident due to an 11 to 12 foot high granite retaining wall at the north edge of the Somerbridge site.

A pedestrian / bicycle overpass is also considered at two potential locations in Study Area A. Each is intended to provide access from the Inner Belt over the Green Line Extension and/or commuter rail tracks.

Access ramps or overpasses must not have a steeper slope then 8.33% for very short sections, with the typical grade not to exceed 5% under guidelines by the American Disabilities Act and as defined by AASHTO.

Additional considerations for access ramps or trail bridges include:

- **Switchback Design:** Either 90-degree angle corners or 180-degree switchbacks should provide additional space for bicyclist maneuvering, and for cyclists and pedestrians to add each other. A corner or a switchback should include at least 50% of the ramp's width in additional space for comfortable turning.
- **Ramp/Overpass Width:** Ramp or overpass width should follow the same guidelines for shared use paths, and should take into account additional "shy" distance from railings and/or adjacent walls. Combined, the typical width is 14 feet wide. Outwardly flared fencing can effectively and inexpensively make the fenced area wider without changing the structure.
- **Offset / Setback Distance from Roadways**: Both access ramps and pedestrian/bicycle overpasses should provide a safe setback distance from any adjacent roadways. From adjacent sidewalks and shared use paths, the ramp or overpass should be setback at a minimum the width of the facility itself to provide a flat landing area for bicyclists to slow down.

The pedestrian/bike bridge over Storrow Drive adjacent to the Longfellow Bridge includes a generous landing for trail users (Image: Google Street view)

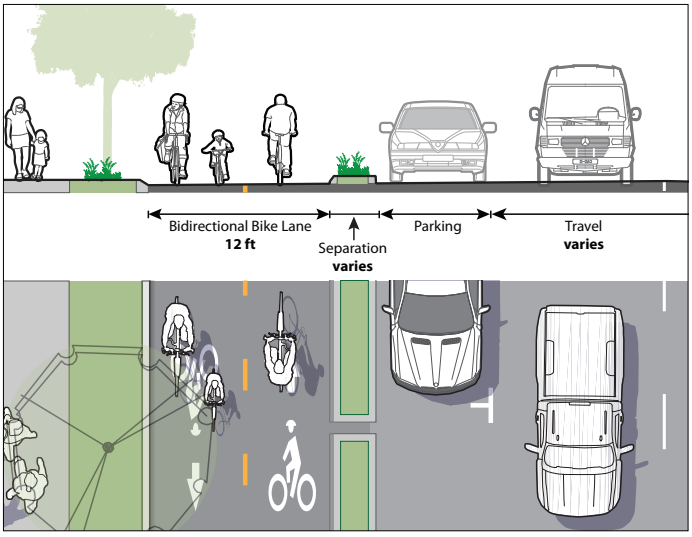
On-Street Bicycle Facilities

BI-DIRECTIONAL SEPARATED BIKE LANE (ROAD GRADE)

Bidirectional separated cycle tracks are bicycle facilities that allow bicycle movement in both directions on one side of the road. These facilities are at-grade and within the roadway right of way, and physically separated by a vertical element. Two-way separated cycle tracks share some of the same design characteristics as one-way separated bicycle lanes, but may require additional considerations at driveway and side-street crossings. To simplify operational concerns, two-way separated cycle tracks function best on the left side of the street.

Additional considerations include:

- Functions well to fill gaps in shared use path corridors.
- Functions well on streets with few conflicts such as driveways or cross streets on one side of the street.
- Standard bidirectional separated bike lane width is 12 ft.[6] Reduced width is 10 ft.[7]
- Minimum separation width next to parking is 3 ft to accommodate opening doors.[8]
- In constrained conditions for short segments, minimum width is 8 ft.[9]
- Safe and convenient connectivity to public transit.

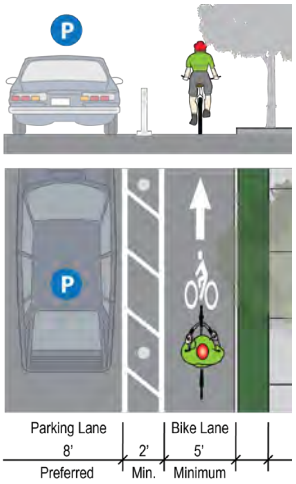


Example of a two-way separated cycle track adjacent to a sidewalk (Image: Empire State Trail Design Guide, published July 2017.)

A two-way, separated bicycle facility in Seattle

ONE-WAY SEPARATED BIKE LANE (ROAD GRADE)

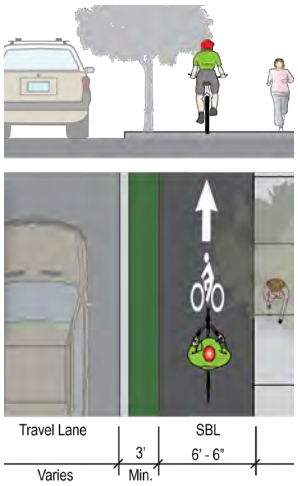
These bikeways are at street-level and use a variety of methods for physical separation from passing traffic. A striped buffer plus a motor vehicle parking aisle, flexible delineator posts, trees, or other vertical elements provide the visual and/or physical separation from motor vehicle traffic. A separated bicycle lane treatment is one of the best ways to create an "all ages and abilities" bicycling environment on busy streets.



Example of a one-way separated bike lane adjacent to a sidewalk in Chicago

ONE-WAY SEPARATED BIKE LANE (SIDEWALK GRADE)

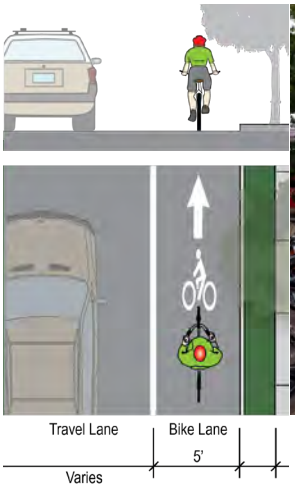
These bikeways are vertically separated from motor vehicle traffic. Many are paired with a furnishing zone between the separated bike lane (SBL) and adjacent parking or travel lane. At intersections, the raised SBL can be dropped and merged onto the street or maintained at sidewalk level. Raised SBLs may be most beneficial along higher speed streets with few driveways and cross streets, along streets with multiple lanes, high speeds or volumes, or high parking turnover.



Example of a one-way separated bike lane at sidewalk grade in Cambridge

STANDARD BIKE LANE

Bicycle lanes designate an exclusive space for bicycles through the use of roadway striping and signage. Occasionally, reducing travel lane width to 10’ provides space for standard 5’-wide bicycle lanes. They may be added to roads with extra wide travel lanes or in replacement of a parking or a travel lane. Where space is not available for bike lanes in both directions, a single “climbing lane” for bikes heading uphill with a downhill shared lane can be employed.



Example of a standard bike lane in Somerville

COLORED PAVEMENT

Colored pavement within a bicycle lane increases the visibility of the facility, identifies potential areas of conflict, and reinforces priority to bicyclists in conflict areas and in areas with pressure for illegal parking. Colored pavement can be used along the entire length of the bicycle facility, or to treat conflict areas, bike boxes, or as intersection crossing markings. Colored pavement should be used across driveways or yield-controlled cross streets, especially with separated or sidewalk level bicycle facilities.

Example of a green painted bike lane in Somerville.

Intersection and Road Crossing Treatment

BIKE LANE THROUGH INTERSECTION TREATMENTS

Intersection Improvements*

Striping bicycle facilities at or through intersections can provide a more comfortable bicycling environment by providing bicyclists with guidance on where to wait for a signal to change or a well-marked route through the intersection to a continuation of the bikeway. By establishing a clear boundary, intersection lane markings effectively mark the paths of travel for through bicyclists and turning bicyclists, as well as through and turning motor vehicles. The use of green colored pavement raises awareness for all road users to potential conflict areas.

Intersection Crossing Marking

Intersection crossing markings are extended striped bicycle facilities through intersections, clarifying to motorists where to expect bicyclists. This can be especially important at wide and complex intersection.

Design Features

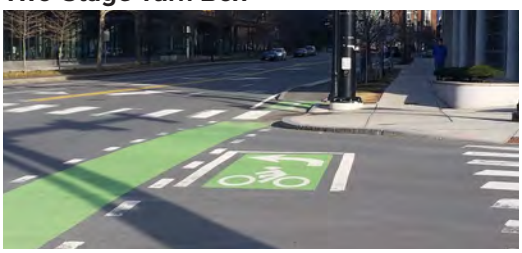
- Striping adjacent to motor vehicle travel lanes shall be 6" wide
- Broken lane lines should be 2 foot-long lines with 2' to 6' spacing
- Shared lane markings, chevrons, and helmeted rider stencils may be used to increase visibility and awareness of an approaching conflict area, and can be used across the entire intersection
- Crossing lane width should match adjoining bicycle facility width

*Potential treatments shown here have received Interim Approval from FHWA but are not yet formally incorporated into the Manual of Uniform Traffic Control Devices (MUTCD)

Bike Box

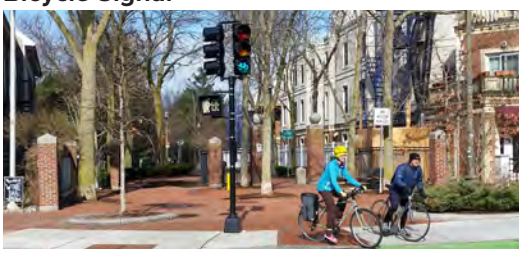
A bike box places riders in a designated area ahead of queuing traffic during the red signal phase, also helping to reduce right-hook conflicts. Ideal for two-lane roadways.

Two-Stage Turn Box

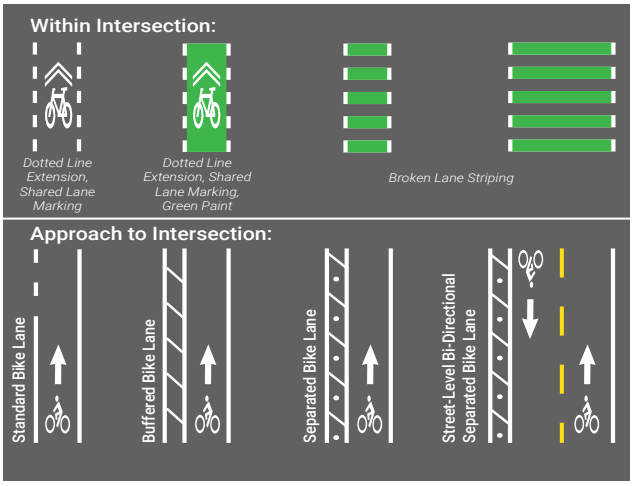


For bicyclists uncomfortable sharing lanes with turning traffic, a two-stage turn boxes offers a more comfortable left-turn option. Ideal for roadways with three or more lanes.

Bicycle Signal



Bicycle signals facilitate bicyclist crossings of roadways by clarifying when to enter and by restricting other movements during the bicycle phase.



**Use of Shared Lane Marking is considered an option in the NACTO Urban Bikeway Design Guide

ADDITIONAL CROSSING TREATMENTS

Median Refuge Island

Median refuge islands are protected spaces placed in the center of the street to facilitate bicycle and pedestrian crossings. Crossings of two-way streets are facilitated by allowing bicyclists and pedestrians to navigate and wait for gaps in traffic in only one direction of traffic at a time. They are especially helpful when placed on wide roadways which may have long crossing times. Median refuge islands calm motor vehicle traffic by physically narrowing the roadway. Desired median width is 10 feet, and minimum effective width is 6 feet.

Example of a median refuge island on Massachusetts Ave. in Arlington, MA

Rectangular Rapid Flashing Beacons

Rectangular Rapid Flashing Beacons (RRFBs) are user-actuated warning beacons located at un-signalized intersections or mid-block crossings. Although most beacons are activated manually with a push-button, some are activated passively through detection. This warning type should be used to alert drivers to yield where pedestrians and bicyclists have the right-of-way crossing a road. RRFBs have been proven to increase driver yield behaviors in comparison with standard crossing warning signs and markings. In addition to the typical application of locating RRFBs at mid-block crossings or un-signalized intersections, additional applications for this amenity include locations where driver yield compliance has historically been low. RRFBs are an excellent solution to user mobility challenges, as passive detection options may be installed which remove the need to push a button.

Example of an Rectangular Rapid Flashing Beacon in Greenfield, MA

Urban Trail Precedents

The links between the CPX, Grand Junction Path, and Mystic River Greenways path network offer a unique opportunity to plan for and implement a series of unique urban trail connections that require investigating precedents from other U.S. cities. To better understand issues related to trail character, design issues, and surface treatment, three trails were briefly studied:

- Indy Cultural Trail (Indianapolis, Indiana)
- N Street Cycle Track (Lincoln, Nebraska)
- Capital Bikeway (St. Paul, Minnesota)

INDIANAPOLIS, INDIANA: INDIANAPOLIS CULTURAL TRAIL

The Indianapolis Cultural Trail is managed by a nonprofit, Indianapolis Cultural Trail, Inc. (ICT, Inc.) ICT works to "thoughtfully manage, maintain and continue to grow and improve all aspects of the Trail to ensure it continues to exist as a world-class public space for residents and visitors of Indianapolis."[10]

In the early 2000s, $4 million was raised for feasibility and design studies. In 2004, the City of Indianapolis gave permission to use city right-of-way to build the trail. Groundbreaking took place in 2007. In 2010, the trail received a $20.5 million Transportation Investment Generating Economic recovery (TIGER) grant. In May 2013, the 8 mile trail was completed and the official grand opening took place.

INDIANAPOLIS CULTURAL TRAIL™
A Legacy of Gene & Marilyn Glick

The trail has an interesting and colorful logo and website. (Image: https://www.facebook.com/IndyCulturalTrail/)

The entire budget for the trail's construction was $63 million. The trail was designed by the landscape architecture and urban planning firm Tundell Ernstberger Associates.

The Indy Cultural Trail

Prairie modules art along the Indy Cultural Trail. (Image: https://indyculturaltrail.org/wp-content/uploads/2019/05)

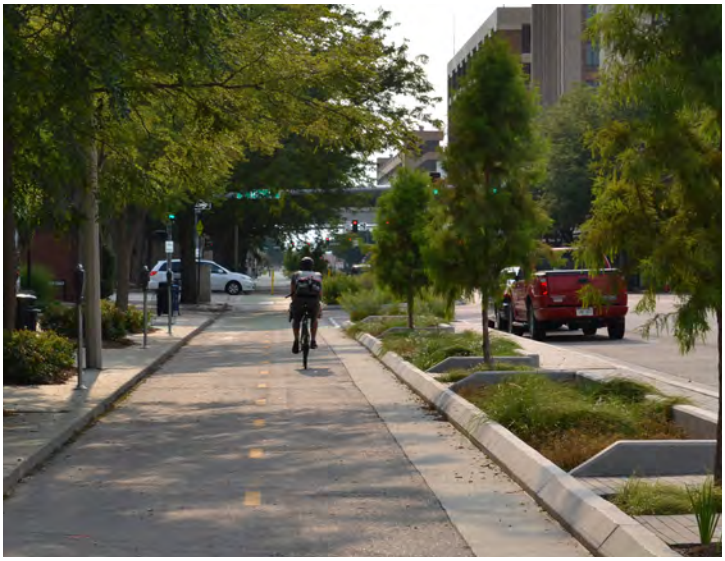
The trail is noted for its wide pedestrian and bicycle pathways. (Image: http://landscapevoice.com/indianapolis-cultural-trail/)

LINCOLN, NEBRASKA: NORTH STREET CYCLE TRACK

The N Street Cycle Track, a two-way bicycle facility, is a critical piece of the city's 128-mile trail network. The cycle track opened in April 2016. The protected bike facility connects Haymarket at one end and Antelope Valley Trails on the other. The cycle track runs for 17 blocks from 23rd Street to Arena Drive. Angled parking and once vehicle travel lane were converted into the cycle track with a visually appearlng landscaped buffer.

The cycle track is the first of its kind in the state of Nebraska. The cycle track utilizes green painted two-stage bike turn boxes as well as bicycle traffic signals.

The N Street Cycle Track



The N Street Cycle Track connects two popular destinations in Lincoln.

ST. PAUL, MINNESOTA: CAPITAL BIKEWAY

The Capital Bikeway is a two-way, sidewalk grade, protected facility featuring a landscaped buffer. The Capital Bikeway is a network of bicycle facilities throughout downtown Saint Paul that connects to existing trails. When complete, the majority of downtown will be within a few blocks of a bike and pedestrian trail. The first segment was completed along Jackson Street in 2017. The Jackson Street segment is the first dedicated off-street bike path in downtown St. Paul.

Porous asphalt improves drainage and storm water runoff quality issues. Additional improvements as part of the bikeway project include benches, street lights, wayfinding signage, and public art.

Capital City Bikeway

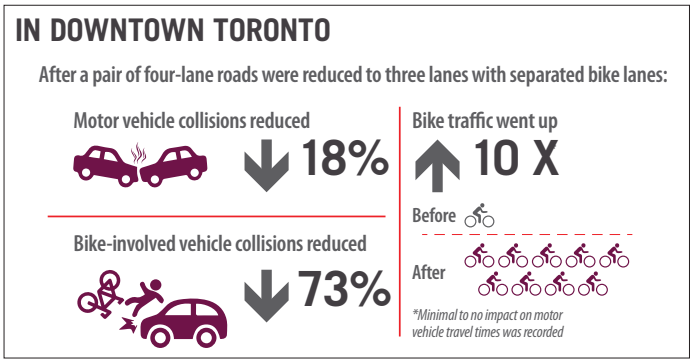
The Capital City Bikeway in downtown St. Paul. (Image: https://goffpublic.com/saint-paul-unveils-its-innovative-capital-city-bikeway/)

APPENDIX B
Active Transportation Benefits / Mode Share Analysis

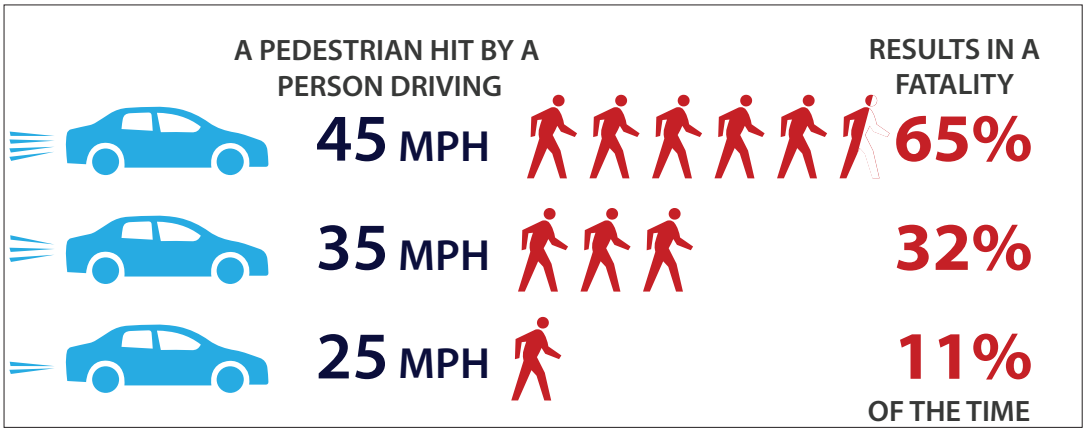
Pedestrian and bicycle facilities offer a wide range of direct and indirect transportation, safety, economic, and health benefits. This section outlines some of the wide ranging benefits that extending and connecting the Mystic River Greenway, Community Path Extension, and Grand Junction Path would have on the immediate area and the region.

TRANSPORTATION BENEFITS

- Pedestrian and bicycle facilities offer additional mobility options for those who do not have access to a motor vehicle due to age (children and seniors), economic status, disability, or temporary impairment and for those who do not wish to use a car.
- Generally, pedestrian and bicycle facilities help minimize traffic conflicts, which provides improved motor vehicle capacity and eases congestion.
- In the US, 40% of motor vehicle trips are under two miles in length and many travelers would access destinations by bicycle or on foot if comfortable pedestrian and bike facilities were provided.[11]
- Extending the Mystic River Paths and formally connecting to the Community Path Extension will provide access to new Green Line Extension and Orange Line stations to thousands of potential commuters from communities adjacent to the existing Assembly Square paths, including Everett, Revere, Malden, and Medford, Somerville, Cambridge, and Boston



Source: Keenan, Edward. "Bike Lanes Prove That Transportation Solutions can be Cheap and Effective." The Toronto Star, 1/11/2019.



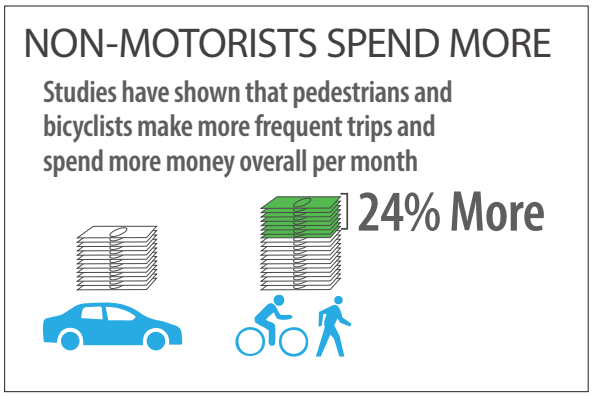
Source: Tefft, B. C. Impact speed and a pedestrian's risk of severe injury or death. Accident Analysis & Prevention 50 (2013) 871-878.

SAFETY BENEFITS

- In one of the most comprehensive studies of bicyclist and road safety, researchers have found that cities with robust bicycling facilities had the largest reduction in fatal crashes. The study, which looked at 13 years of data from 12 U.S. cities, found that bicycle facilities can slow motor vehicle speeds and help reduce the occurrence of fatalities.[12] (This is particularly significant for this study as a number of schools lie within 1/2 mile of the CPX, including Somerville High School, the Cummings School, Capuano Early Childhood Center, and the East Somerville Community School.)

Based on FHWA's Crash Reduction Factors database, installing a:

- Sidewalk along a roadway can reduce the probability of a pedestrian crash by 65-89%
- Pedestrian countdown timers can reduce the probability of a pedestrian crashes by 25%[13]
- Raised median island at a crosswalk can reduce the probability of a pedestrian crashes by 46%
- Improved pedestrian and bicycle facilities have led to an increase in the number of walkers and bicyclists and decreased number of crashes, injuries, and fatalities through the "safety in numbers" effect because of an enhanced awareness of vulnerable users by motorists.[14]
- Pedestrian and bicycle infrastructure improvements - e.g. bicycle lanes, on-street parking with curb extensions, median islands, and other traffic calming measures - help to moderate traffic speeds, reducing the severity of crashes



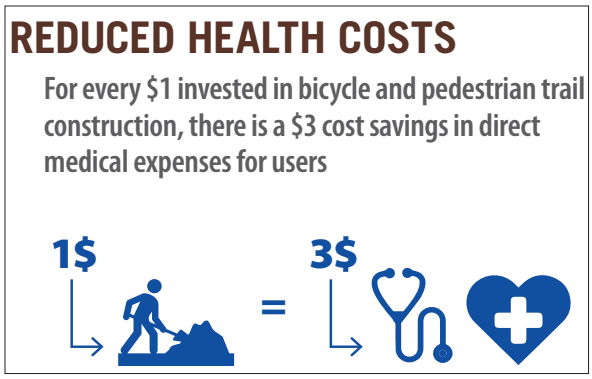
Source: Clifton, Kelley J, Morrisey, Sara, and Ritter, Chloe (2012), "Business Cycles: Catering to the Bicycle Market." Transportation Research Board's TR News, Number 280, May-June 2012.

ECONOMIC BENEFITS

- Studies have shown that pedestrians and bicyclists make more frequent trips and spend more money overall per month compared to motor vehicle drivers.[15]
- When new separated bicycle lanes were added to Broadway in Salt Lake City, retail sales increased 8% the following year, despite a 30% reduction in on-street parking; over 80% of business owners were supportive or neutral of the new bicycle lanes and other streetscape improvements.[16]

HEALTH BENEFITS

- Walking and bicycling provide an opportunity for people to integrate into their daily lives the Centers for Disease Control & Prevention's (CDC) recommended 150 minutes of weekly aerobic activity.
- Men who cycle to work are significantly less likely to be overweight and obese (39.8%) than those who drive to work (60.7%).[17]



Source: Chenoweth, David. (2012). "Economics, Physical Activity, and Community Design." North Carolina Medical Journal 73(4): 293-294.

Mode Share Analysis

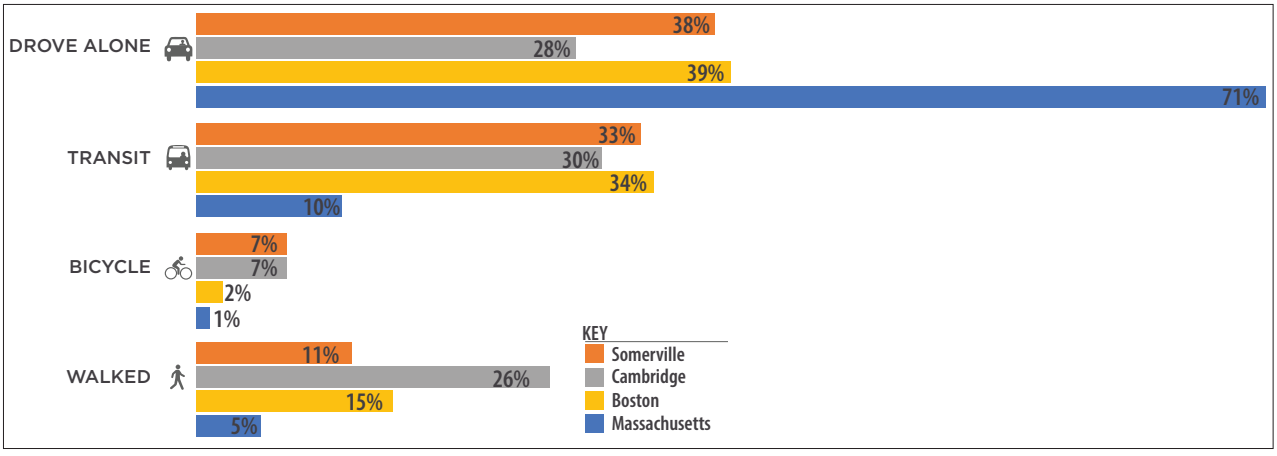
Understanding active transportation recreation and commuting trends among area households can support expansion of, and investments in, comfortable active transportation facilities.

Utilizing data from the American Community Survey, it is clear that Somerville, Cambridge, and Boston have significantly higher walk and bike mode share than the Commonwealth of Massachusetts as a whole. Additionally, the three cities that comprise the study area have a significantly lower rate of drive-alone commutes to work then the state as a whole.

The graphic below shows how the three cities in the study area compare to the state. While the rest of the state may not have the same access to comfortable on-road bicycle facilities, off-road shared pedestrian and bicycle facilities, and transit, it still indicates the sheer volume of those who bike and walk both within and to Somerville, Cambridge, and Boston. Extending the Mystic River Greenway system to the CPX and GJP will complete a critical gap in the system from the west and the north, allowing many would-be bicycle, pedestrian, and transit commuters to have the option to switch from driving alone to a healthier or more environmentally sustainable active transportation or transit option.

Linking the Grand Junction Path to the Community Path extension will promote more walking and bicycle commuting

Commuter Mode Share



Source: American Community Survey, Table B08301: Means of Transportation to Work: 2017 5-Year Estimates (some additional methods of transportation to work available were removed from the bar chart)

REFERENCES

2019 MassTrails Grant awards - See page 9 Feasibility Studies A and B (https://www.mass.gov/files/documents/2019/06/26/2019%20MassTrails%20Grant%20Awards.pdf)

2019 MassTrials Grant Application Feasibility Study A - See Maps and Plans on pages 12-22 (https://drive.google.com/file/d/1lE_M-0XOU1JWk9HGgpGlqfAoKLfGfi9J/iew?usp=sharing)

2019 MassTrials Grant Application Feasibility Study B - See Maps and Plans p 11-13 (https://drive.google.com/file/d/1GWt357lroqorf3OQcf8cTBtLZFtdl7LU/view?usp=sharing)

Current Regional Path network proposal via the CPX, including the Grand Junction Path and Mystic to Charles Connector (https://www.facebook.com/FriendsoftheCommunityPath/photos/a.1204890876234383/1845328138857317/?type=3&theater)

2014 Grand Junction Path Routes Alternative Analysis by Northeastern University student Fei Peng, for Professor Peter Furth's Civil Engineering class (https://drive.google.com/file/d/0B7qVAVTOJ3PjMXk1ejR6TE9ScWc/view)

2015 Cambridge Redevelopment Authority, "Closing the Gap" Grand Junction Path Concept Study (https://www.cambridgema.gov/CDD/Projects/Transportation/~/a/8FD0FE8C006341A3894B4B50AF62DA83.ashx)

Current Proposed CPX Connection to Grand Junction Path (https://www.facebook.com/FriendsoftheCommunityPath/photos/a.1204890876234383/1813296748727123/?type=3&theater)

Connection Proposed (by Friends of the Community Path to MassDOT) from CPX to Planned Staybridge Ramp, via MBTA property along GLX (https://drive.google.com/file/d/1GvajrqFVyFD87CO8BmV8bmi58ipjuMNA/view?usp=sharing)

Current Concept Map of Mystic to Charles Connector (https://www.facebook.com/mystictocharles/photos/a.886091818234954/888088548035281/?type=3&theater)

2013 MAPC Report on CPX (http://www.mapc.org/wp-content/uploads/2017/11/2013-06-07_Final-Metric-Report.pdf)

2018 MAPC Landline Vision Report (http://www.mapc.org/wp-content/uploads/2018/06/180620-Landline-Vision-Report.pdf)

2018 (May) Karl Alexander and Liza Burkin, "Making the Case for the Mystic Connector Path", Tufts University and UMass Boston. (https://tuftsgis.maps.arcgis.com/apps/Cascade/index.html?appid=24ff39453a214)

ENDNOTES

1 Pg. 14. 2013-06-07 Final Metric Report.

2 Rails-with-Trails. Lessons Learned. 2012. FHWA. Pg. 57.

3 Rails-with-Trails. Lessons Learned. 2012. FHWA. Pg. 57.

4 Rails-with-Trails. Lessons Learned. 2012. FHWA. Pg. 64.

5 Rails-with-Trails. Lessons Learned. 2012. FHWA. Pg. 65.

6 FHWA Separated Bike Lane Guide 2015.

7 NACTO Bike Guide 2012.

8 NACTO Bike Guide 2012.

9 AASHTO Bike Guide 2012.

10 https://indyculturaltrail.org/about/

11 2009 National Household Travel Survey

12 Wesley E. Marshall, Nicholas N. Ferenchak. Why cities with high bicycling rates are safer for all road users. Journal of Transport & Health, 2019; DOI: 10.1016/j.jth.2019.03.004

13 https://safety.fhwa.dot.gov/provencountermeasures/walkways/

14 Jacobsen, P.L. (2003) "Safety in Numbers: More Walkers and Bicyclists, Safer Walking and Biking." Injury Prevention Journal #9

15 Clifton, Kelley J, Morrisey, Sara, and Ritter, Chloe (2012), "Business Cycles: Catering to the Bicycle Market." Transportation Research Board's TR News, Number 280, May-June 2012

16 Anderson, Michael, (October 2015), "SLC Street Remove Parking, Adds Bike Lanes and Sales Go Up.", People for Bikes blog

17 Wen, L., and C. Rissel, 2008 - Inverse associations between cycling to work, public transport, and overweight and obesity: Findings from a population-based study in Australia, Preventive Medicine, 46, 29-32NACTO Urban Bikeway Design Guide. 2012.

APPENDIX C

Freight Train Storage Memo

TO: FRIENDS OF THE MYSTIC TO CHARLES CONNECTOR

FROM: ALAN MOORE, CO-PRESIDENT, FRIENDS OF THE COMMUNITY PATH

RE: ANALYSIS OF A POSSIBLE RAIL-WITH-TRAIL FOR THE PROPOSED MYSTIC TO CHARLES CONNECTOR ROUTE

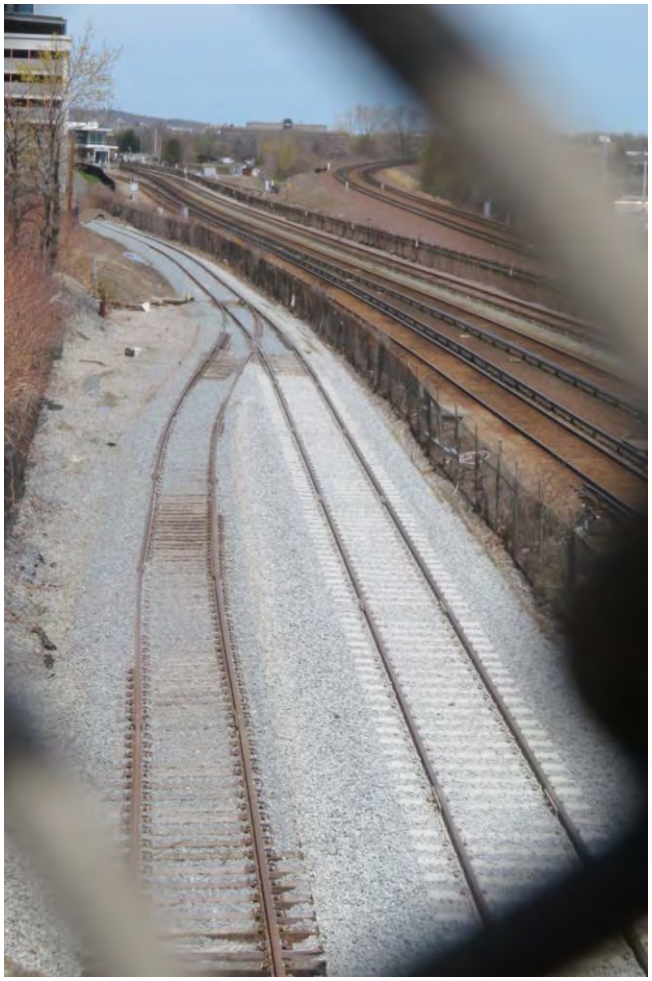
DATE: MAY 21, 2020

CC: PHIL GOFF, ALTA PLANNING + DESIGN; FRIENDS OF THE GRAND JUNCTION PATH

Two Tufts Urban and Environmental Policy and Planning student projects (https://tinyurl.com/y85pft86 https://tinyurl.com/ybltv4n9) and Friends of the Community Path and Friends of the Mystic to Charles Connector along with Alta Planning + Design have researched the use of a freight rail corridor in Somerville for an off-road bicycle/pedestrian path from Assembly Sq. area to Inner Belt.

This proposed path, called the Mystic to Charles Connector (M2C) would connect the Mystic River paths to the Community Path (CPX), the Charles River paths and the Grand Junction Path. The 3 sections shown in the map to the right will be discussed in detail separately.

This freight rail corridor, whose tracks were recently rebuilt in two section, branches off the Lowell commuter rail line tracks south of Washington St. in Somerville, travels east through Inner Belt parallel to New Washington St. (right photo), crosses Inner Belt Road at grade (left photo below) and then curves north to pass the Sullivan Orange line station on the west side, ending in 2-dead end tracks that were recently rebuilt (right photo below).



This memo provides additional information and graphics about the three sections of this rail corridor and presents alternative strategies to use it as a critical link in the greenway path network north of Boston, possibly sharing the corridor with continued rail use, i.e., Rail with Trail (as is being planned presently for the CPX in Somerville and the Grand Junction in Cambridge).

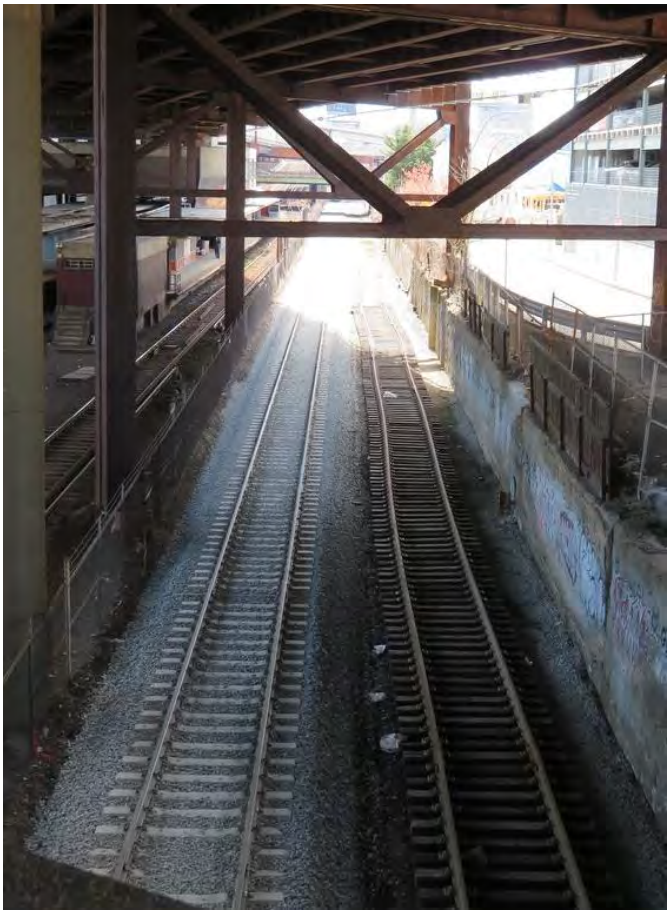
Before presenting the section-by-section description (going from North to South, numbered 1,2,3 on the map on Page 1), it is important to understand the width needed for single and dual freight rail tracks. I have analyzed a number of sources of the minimum width for a single freight rail line and a set of 2 parallel freight tracks between "borders", either a fence or wall.

For a single track, there can be no obstructions (walls, fences, etc.) on either side that are closer than 8.5 feet from the center of the 2 tracks. Therefore, this minimum width is 17 feet. https://www.mbtarealty.com/wp-content/uploads/pdf/mbta_construc_specs1.pdf https://www.michigan.gov/documents/rcbook_55515_7.pdf

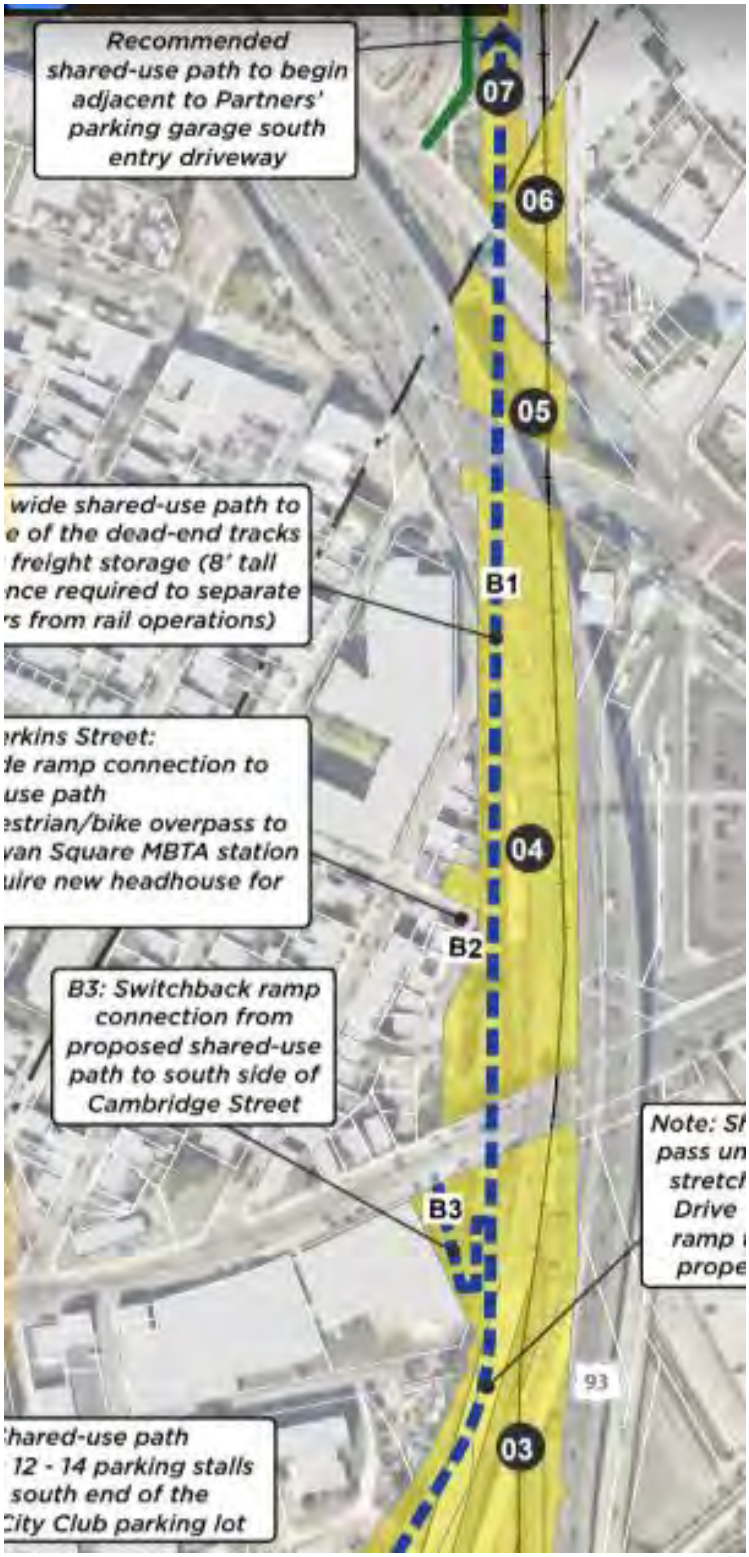
For 2 sets of tracks, 2 freight rail cars can pass each other between fences or walls within a width of 22-23 feet. This occurs at stations where there is obviously no any extra space between the platforms or walls and the trains (so that riders can board). This can be seen at commuter rail or Amtrak stations, where there is only 23' for 2 sets of tracks (even for high speed rail to NYC) between platforms. However, there are regulations requiring "emergency" space for workers on the sides that increase the width to 30' (see above reference). The Green Line Extension (GLX) project is using even wider spacing, even where there are width constraints. For example, on the new Washington St. bridge, where they are providing 42' for the 2 commuter rail tracks next to the Green Line.

Rail Corridor Section #1: Yard 21 Lead tracks from Sullivan Station north to dead-end at shared-use path along Orange line.

This double track rail section extends from south of Cambridge St., then 2,200 feet north alongside Sullivan Sq. Orange line station where it joins into a single track and ends south of Partners HealthCare. Photos adjacent to Sullivan Sq. Orange Line station itself below.



All this property along this corridor section is owned by either MassDOT or MBTA. The legal ownership ranges in width from 125’ to 350” for the multiple tracks (up to 7) here. Map right below from Alta's feasibility study report.



Even though the DOT/MBTA owned width of the rail corridor is wide, the width of this rail corridor between physical obstructions (i.e., other tracks, walls, bridge abutments, etc.) varies considerably and is quite narrow in places.

South of the Sullivan Sq. station, the double freight track corridor is wide and there is room for both dual rail tracks and a Path.

And north of Mystic Ave./Main St., there is room for 2 tracks and the Path to connect to the existing shared use Path alongside the Orange line.

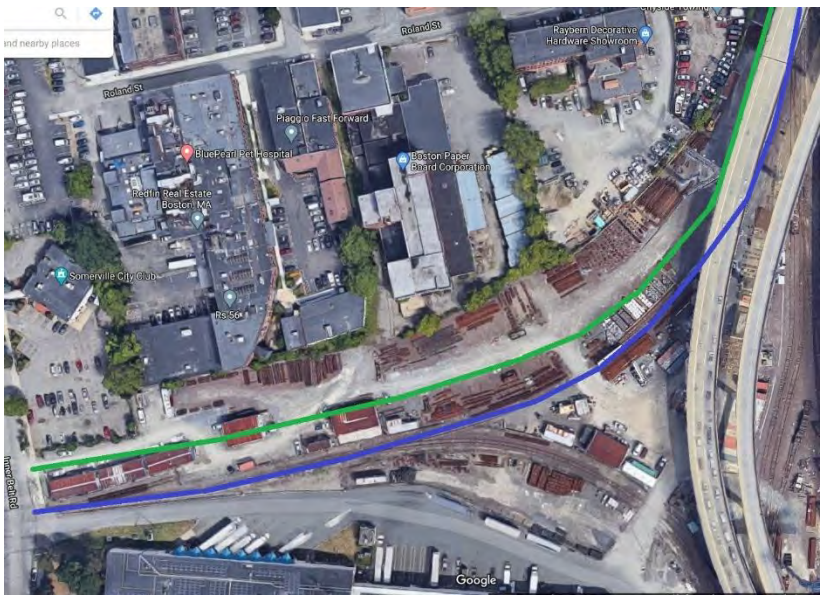
However, because of the 3 Orange line tracks and 2 commuter rail tracks from Sullivan Square station north to Mystic Avenue, the width is only 28-30 feet, allowing only room for the 2 tracks (or 1 track and a Path). This "pinch point" is about 1,300' long. This is the most critical section of the corridor for a shared-use Path as there is no other route that does not cross 4 motor vehicles roads (Cambridge St., Mystic Ave./Maffa Way, I-93, and Mystic Ave./Main St.).

The double set of rail tracks here, which had been used very seldom over the preceding decade, were rebuilt in March 2020 so that PanAm Railways can bring rail cars down the Lowell line, along the Yard 10 lead (see rail section 3), and then store and sort them. PanAm wants use of both sets of tracks so a locomotive can pass stored rail cars and push them in as well as pulling them out. MBTA is allowing this because they took away the area (Yard 7) north of former Red Bridge, (where PanAm had stored and sort rail cars) for the Green Line Extension. There are two tracks so the engine can pull the cars in, decouple and back out on the other track. Otherwise they would have go down the southbound leg of the way and then push the cars back up into the yard (which they can still do if they have too many cars for one track).

For a shared-use Path to fit in this 1,300' long section (see possible cross-section depiction in the Appendix), PanAm would have to use only a single track (which they will greatly not want to do, even though they have not had use of any of these tracks for moving or storing rail cars for the last few years). I have had discussions with some rail experts about the power and influence of PanAm that suggests that using this corridor for a Path will be very challenging.

<u>Rail Section #2: Single track from Inner Belt Rd. east and north to double track section south of Sullivan</u>

This 1,200' long section goes through an industrial area with storage and movement of low value materials. See photo at right showing where a path (in green) and the freight rail (in blue) could easily fit.



Reportedly, this area is used by MBTA (Keolis) Boston Engine Terminal workers to store and move railroad ties and other railroad material. The property ownership maps show that either the MBTA or MassDOT owns this corridor that is 180' - 325' wide, with plenty of room for a shared-use Path and double rail tracks if changes were made from the present inefficient and low value use of this property.

Rail Section #3: Yard 10 Lead, single track from the Lowell line to Inner Belt Rd. (1,900 feet)

This rail track was rebuilt by the GLX project a few years ago (see first photo on page 2) for PanAm to move freight rail cars to rail corridor sections #1 and #2. They have apparently not been used (much) for a number of years. A memo (dated (1/30/2020) from Alta to Friends of the Community Path and Friends of the Mystic to Charles Connector, summarizing Alta's 1/28/2020 meeting with the MBTA Green Line team, explained that the MBTA planned to use these tracks to also move Green Line vehicles to the Vehicle Maintenance Facility in Inner Belt.

However, light rail vehicles are not allowed to travel on the same tracks on heavy rail freight cars (references: https://www.transit.dot.gov/sites/fta.dot.gov/files/FTA_Report_No._0008.pdf https://www.law.cornell.edu/cfr/text/49/appendix-A_to_part_211). Also, three different rail experts that I contacted confirmed that Green Line vehicles will not be traveling on these rails. These same experts explained that the predominant use of these tracks will be PanAm Railways to move, store and re-arranging rail freight cars.

This discrepancy was brought up in an email exchange with Terry McCarthy on March 23, 2020 (see Appendix), when Terry said that the MBTA will indeed be using the corridor to move freight cars, not light rail vehicles.

This 1,900' single track corridor varies in width and ownership and is much wider than needed for a single set of track. Much of this corridor section is owned by the City of Somerville, possibly since they bought the property that now contains the dog park, at Inner Belt Rd. and New Washington St. This long east-west parcel owned by Somerville varies in width from 35' to 105' wide at the dog park to 162' wide at the western end. The single line track is only using about 14' of this width. The next property to the south is owned by the MBTA. There is plenty of both physical width and public ownership to have 2 tracks there, one track for storing rail cars and 1 track for locomotives to move rail cars past the stored cars. This could be an alternative location for PanAm to store and sort rail cars (see last section of memo).

In any case, since New Washington St. is wide and parallel to this section of track, a shared-use path can use New Washington St. and therefore a successful Path design does not need this section of the freight rail corridor

Comparison of the narrow Yard 21 Lead dual track section at Sullivan Sq. to the Northern Strand Trail at Route 16 in Everett

In March and April of 2020, I discussed with three Bike to the Sea advocates how they succeeded in getting the Northern Strand extension (also a rail with trail), under design now) approved to be extended south in Everett to the Mystic River, since this is a very similar situation to the proposed M2C rail-with-trail route via the Yard 21 lead (dead-end) tracks under analysis here.

This photo to the right shows the double dead-end tracks (like the Yard 21 lead tracks at Sullivan, **section #1** above) where the MBTA stores gravel train cars and gravel piles itself at the present south end of the Northern Strand. As just said, the similarity of the 2 locations is that both have a set of double tracks leading to a dead end being used to store and re-order rail cars. And the MBTA initially did not agree to allow a Path in the area.

Comparing the present south end of the Northern Strand (NS) with the southern end of the Mystic River Greenway path along the Orange line tracks past Partner's Health Care (i.e., the northern end of our desired M2C path). the principal differences in the 2 situations are:

1. the Northern Strand corridor is wider, and the MBTA is the user of the double-track yard on the Northern Strand. They can still use the 2 sets of tracks without preventing a rail w/trail.

2. The Yard 21 lead tracks pass the Sullivan Sq. station in a narrow ~27-30'' wide section, with no remaining space for a path as well

3. The section we are investigating will be used by PanAm Railway (PAR).

That said, the Bike-to-the-Sea advocates explained to me that two events precipitated the Northern Strand southward extension agreement:

1. Someone higher up in MassDOT than MassDOT rail (which has an understandable single focus of replacing PanAm's lost rail track usage to the corridor) supported finding a way to extend the Northern Strand southwards.

2. The Bike-to-the-Sea advocates found a way to redesign the track locations so that MBTA would still have a gravel storage area, and that even returned MBTA's ability to move the engines around the rail cars - a function they lost some years ago after the inadvertent of a "wye" connection.

Principal Conclusions

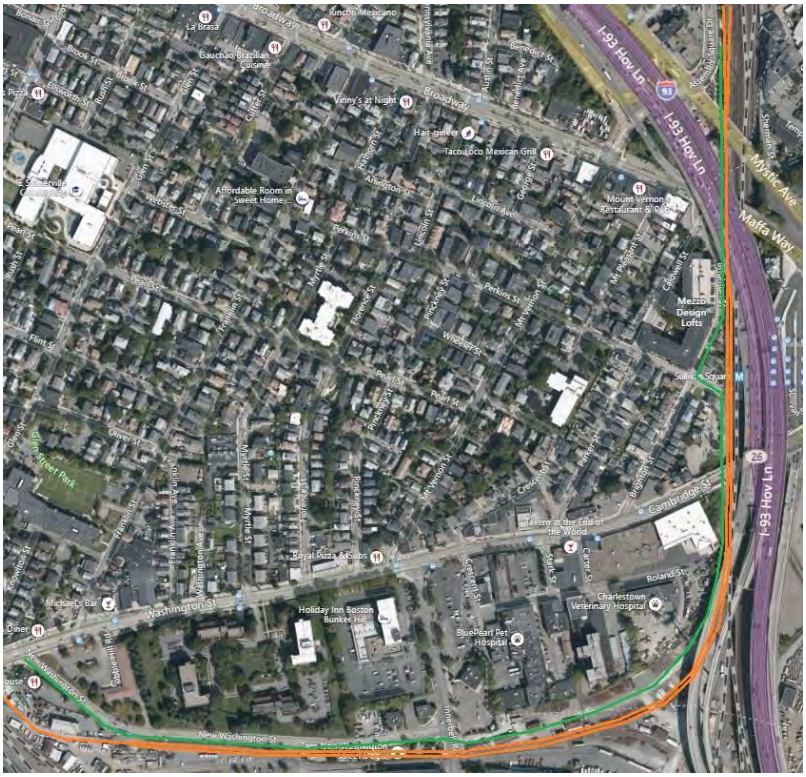
- Rail section #1 - As explained above, the critical pinch point is the 1,300’ section past Sullivan Sq. where there is insufficient width for both the 2 tracks that Pan Am wants and also a shared-use Path.
- Rail section #2 -From there to Inner Belt Rd., there’s width for 2 tracks and a Path if changes were made in the use of this property.
- Rail section #3 -West of Inner Belt Rd., New Washington St. can be used for a cycletrack (shared-use path) without any incursion onto the Yard Lead 10 railway.

Options to Enable a Multi-Use Path in the Rail Corridor

The options (other than no off-road shared-use Path at all for Mystic to Charles) for the 1,300’ pinch point section at Sullivan Sq. are:

1. Getting MassDOT to influence PanAm to accept using only a single track for storage and movement through the entire Sullivan Sq. station area so there would be room for a Path.

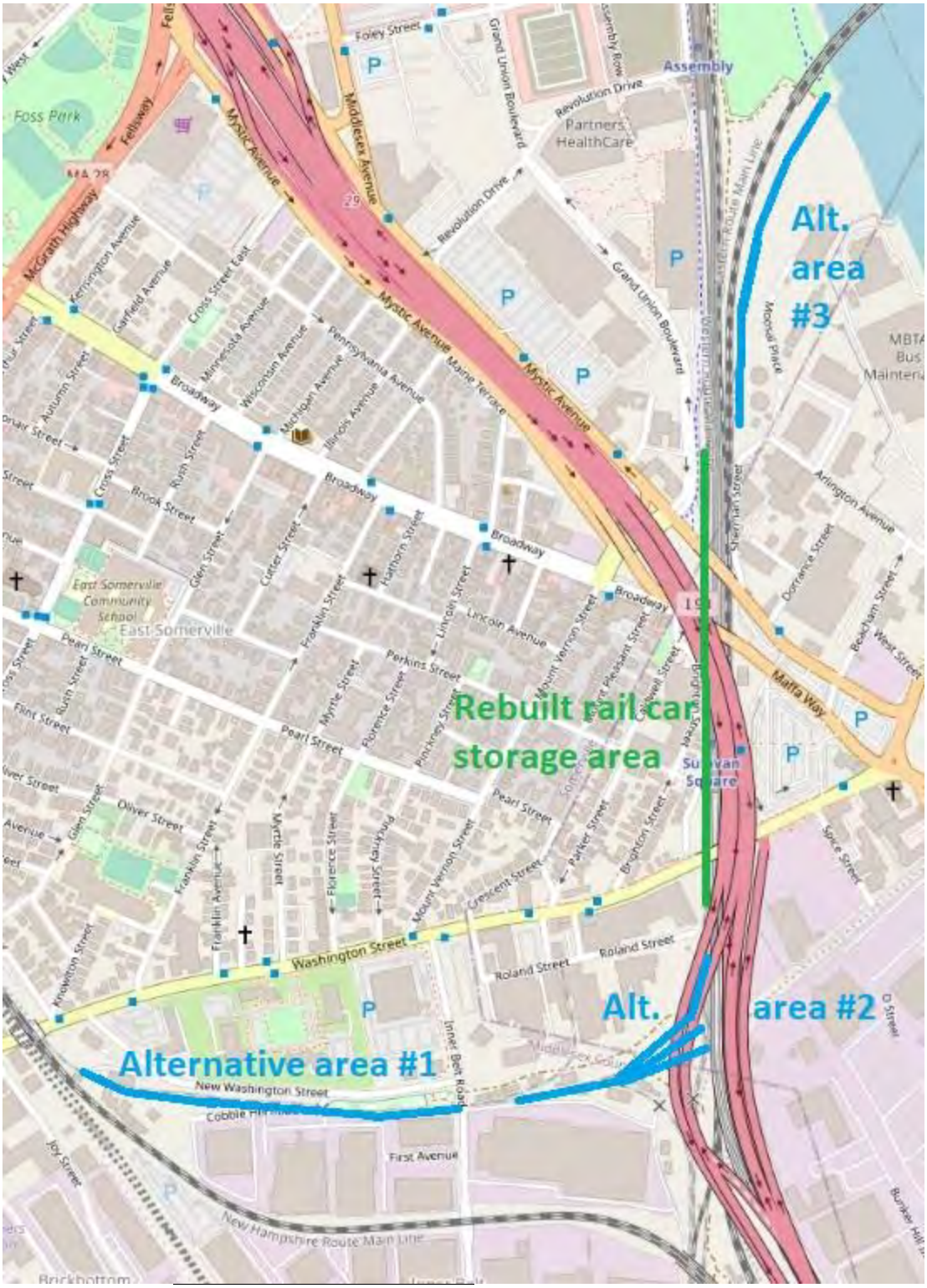
2. Fitting the Path into the corridor but allowing PanAm to have two tracks except for the very narrow 700’ section. With a ramp up to Brighton St. and then a ramp back down. See below and right.



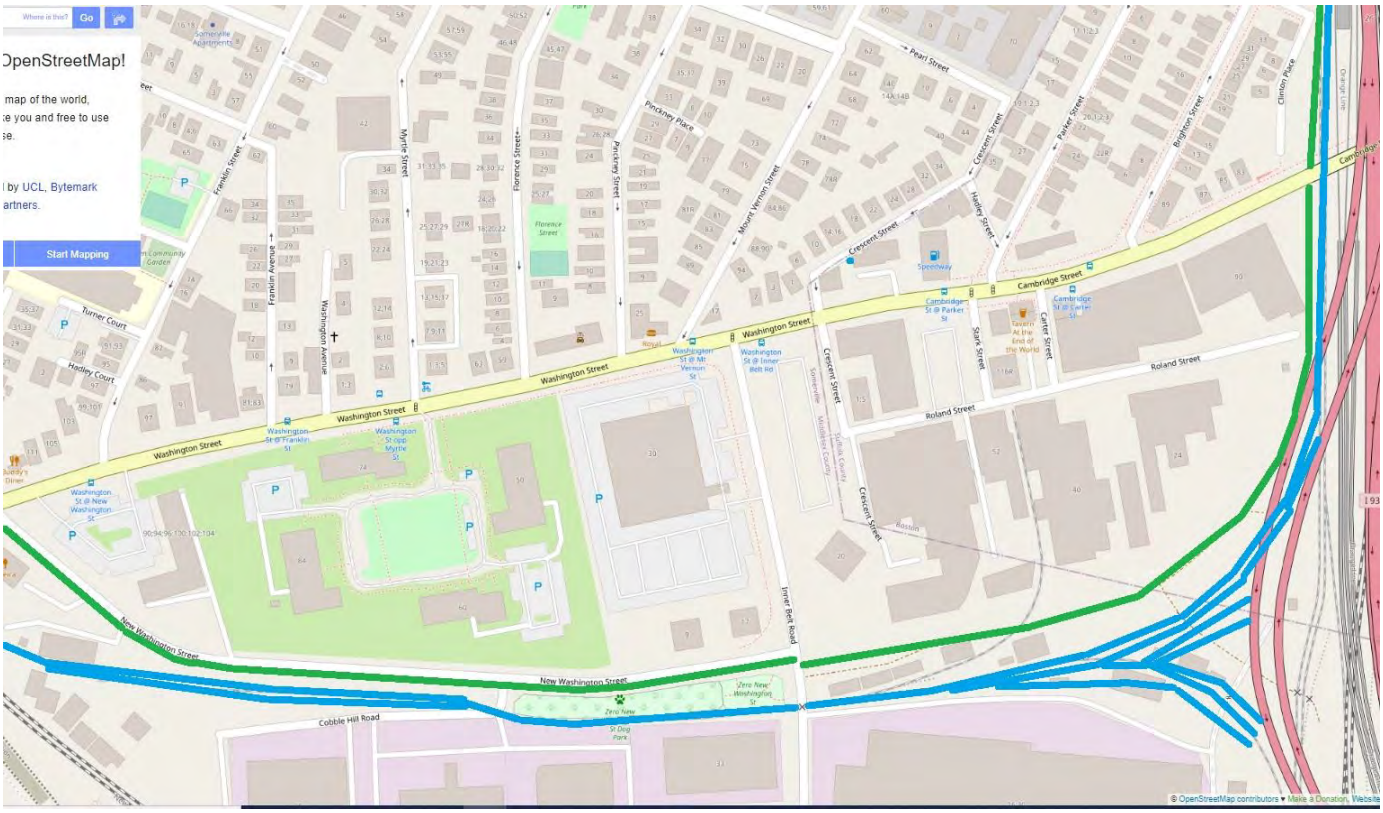
3. Finding PanAm (PAR) alternate locations to store rail cars than the Yard 21 lead:

- North and west in the suburbs, away from the entire Somerville/Charlestown area. This is apparently what they have been doing for the last number of years.

- Using one the 3 close-by alternative locations shown in the maps below for storage and sorting rail cars.



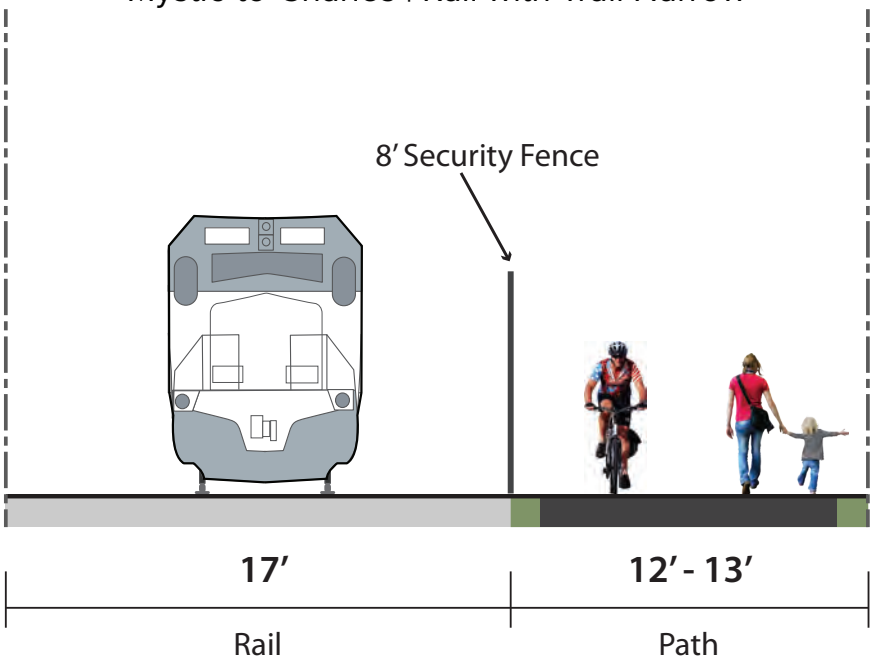
1.West or east (2.) of Inner Belt Rd. in the wide areas:



3. West of the approaches to the Mystic R. crossing where there are already tracks to use.

APPENDICES

Mystic-to-Charles | Rail with Trail Narrow



Email Exchange with Terry McCarthy, Mass DOT, GLX Project

---------- Original Message ----------
From: Alan Moore <alan@pathfriends.org>
To: "McCarthy, Terrence" <TPMcCarthy@MBTA.com>
Date: March 23, 2020 at 3:07 PM
Subject: RE: question on Yard 10 lead tracks, please

Thank you.
I will assume that means that actual Green Line light rail vehicles will NOT be traveling on the Yard Lead 10 track.
Be well too.
Alan
> > On March 23, 2020 at 2:04 PM "McCarthy, Terrence" <TPMcCarthy@MBTA.com> wrote:
Hi Alan,

I was able to speak with MBTA RR Ops and Yard Lead 10 will be used by the BET and for the GLX VMF.
It will function for freight material delivery and storage, it also will aid in rail yard movements.

Take care, be well and stay safe.

Terry

Terrence P. McCarthy, P.E.
MBTA | GLX
Deputy Program Manager of Stakeholder Engagement
200 Inner Belt Rd, Suite 325, Somerville MA, 02143
tpmccarthy@mbta.com mailto:tpmccarthy@mbta.com
Office: (617) 222-4166 | Mobile: (617) 913-9638

From: Alan Moore [mailto:alan@pathfriends.org]
Sent: Monday, March 23, 2020 1:22 PM
To: McCarthy, Terrence
Subject: Re: question on Yard 10 lead tracks, please

Hi Terry:
I'm sure you're v.busy but could you please let me know when you think you might have an answer for us?
THX and be well.
Alan
> > >
On March 17, 2020 at 1:15 PM Alan Moore <alan@pathfriends.org> wrote:

Hi Terry:
Hope you're well.

Question on something Phil Goff heard when he met with you and others last month - that Green Line cars would sometimes be pulled by a Unamog maintenance vehicle on the newly rebuilt Yard 10 lead tracks along New Washington St. through Inner Belt to the new Green Line maintenance facility.

Is this correct?
I have been told by experts in rail regulations that light rail vehicles can never travel on freight tracks, even without passengers.

Plus I inspected the Jan 2019 track plans and there are no connections between the Green Line tracks and the commuter/freight tracks to get to the Yard 10 lead tracks. Lastly, there are no tracks to connect the Yard 10 lead tracks and the new Green Line maintenance facility.

Please advise.

THX,

Alan
alan@pathfriends.org mailto:alan@pathfriends.org
617-455-2103
> >
Alan Moore
Co-President, Friends of the Community Path, Somerville
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617-455-2103
