GRAND JUNCTION TRANSIT FEASIBILITY STUDY

KSA Transportation Working Group
June 13, 2023

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Today's Discussion

Purpose

Share scope of Grand Junction Transit Feasibility Study and progress to date

Outcome

Receive feedback on "Universe of Alternatives" and approach to other feasibility considerations for further study

Process

Project overview, Q&A, and discussion of options preferred for further study

Today's Presentation

- Context
- Why this Study?
- What We've Learned from Previous Studies
- Universe of Alternatives
- Other Feasibility Considerations
- Questions & Answers
- General Discussion

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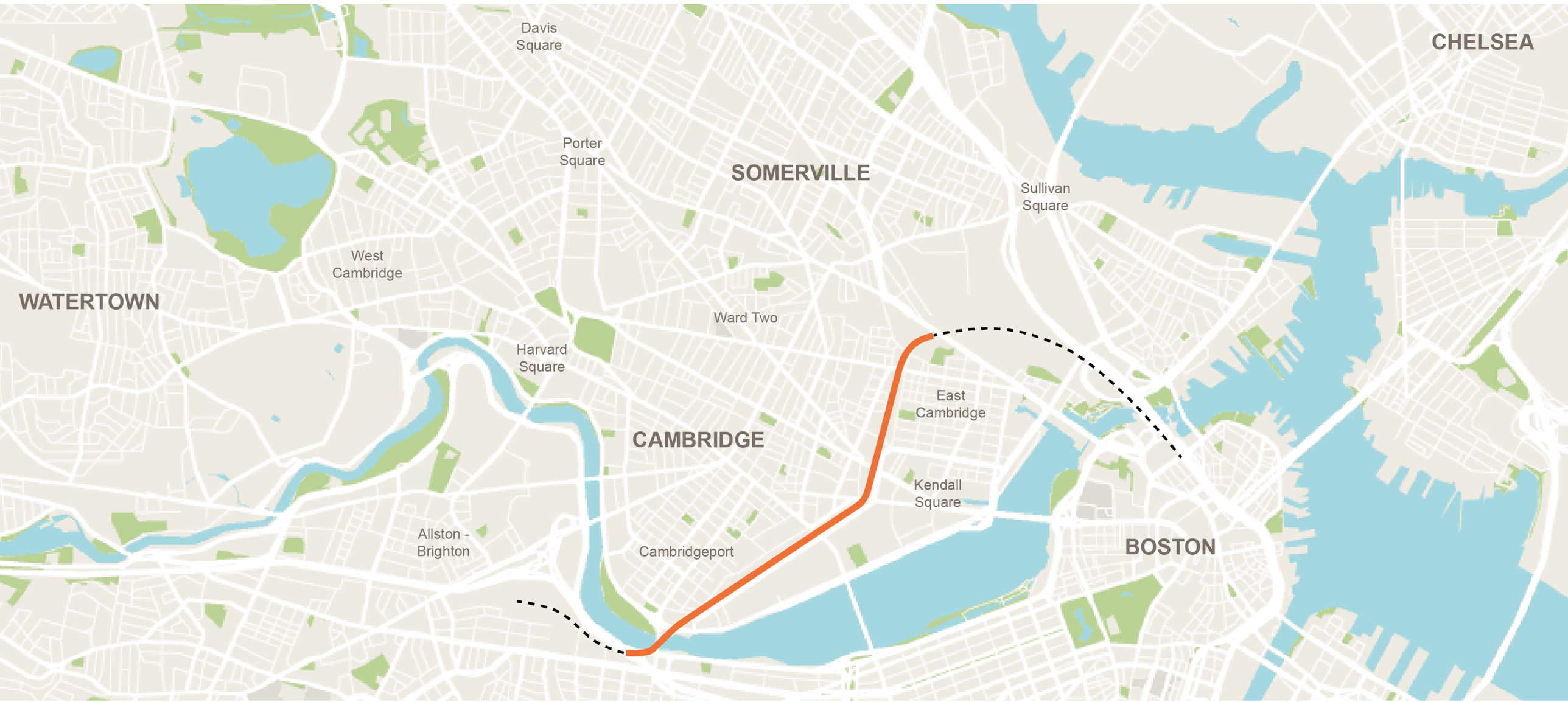
Context

Existing Grand Junction Corridor



Context

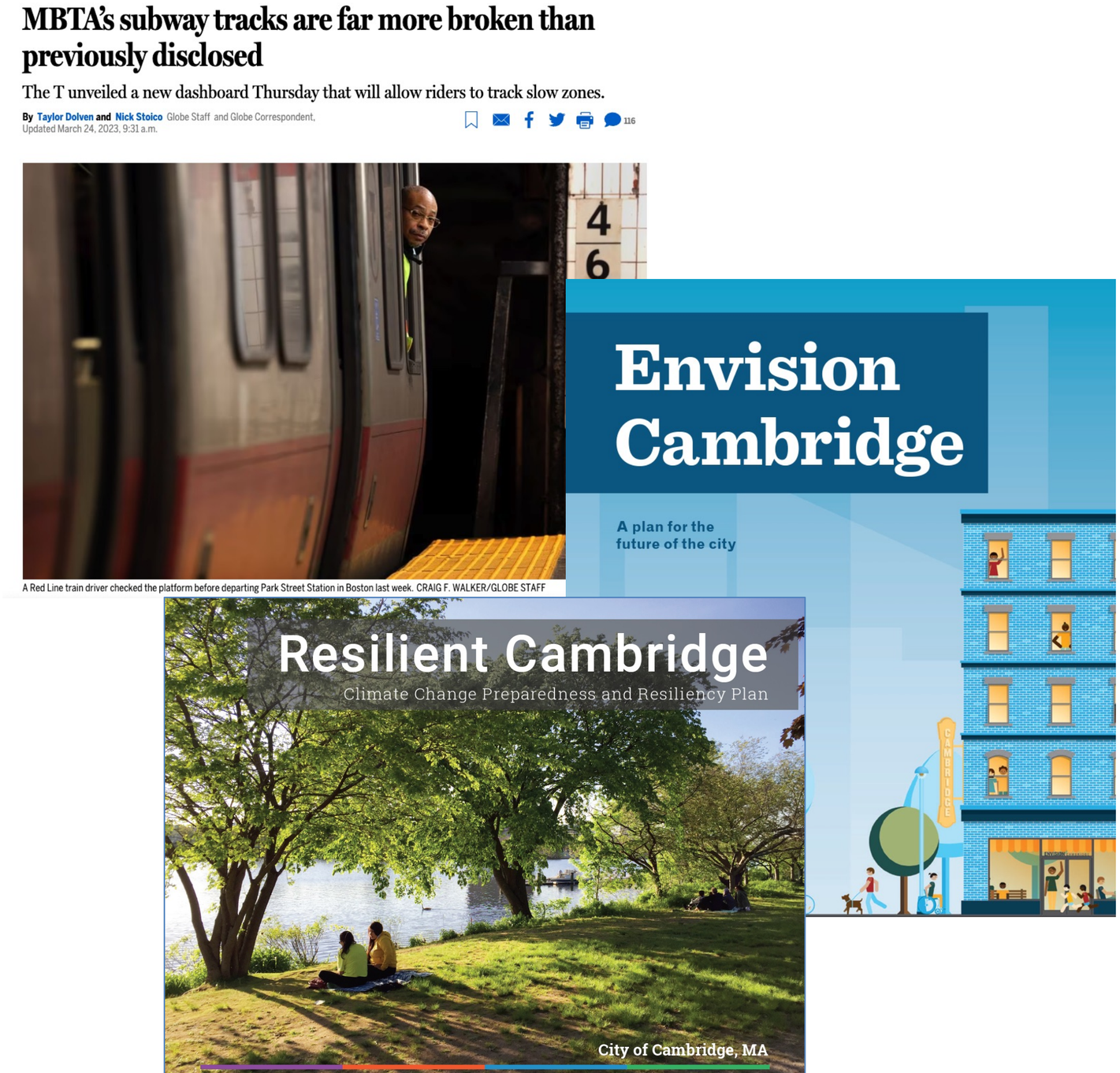
In Progress: Grand Junction Corridor Multi-Use Path

https://www.cambridgema.gov/CDD/Projects/Transportation/GrandJunctionPathway

Why this Study?

Why Transit Along Grand Junction?

- Major North-South transit link across Greater Boston
- Alleviate portions of existing MBTA transit system
- Provide opportunity for Cambridge residents to commute more sustainably



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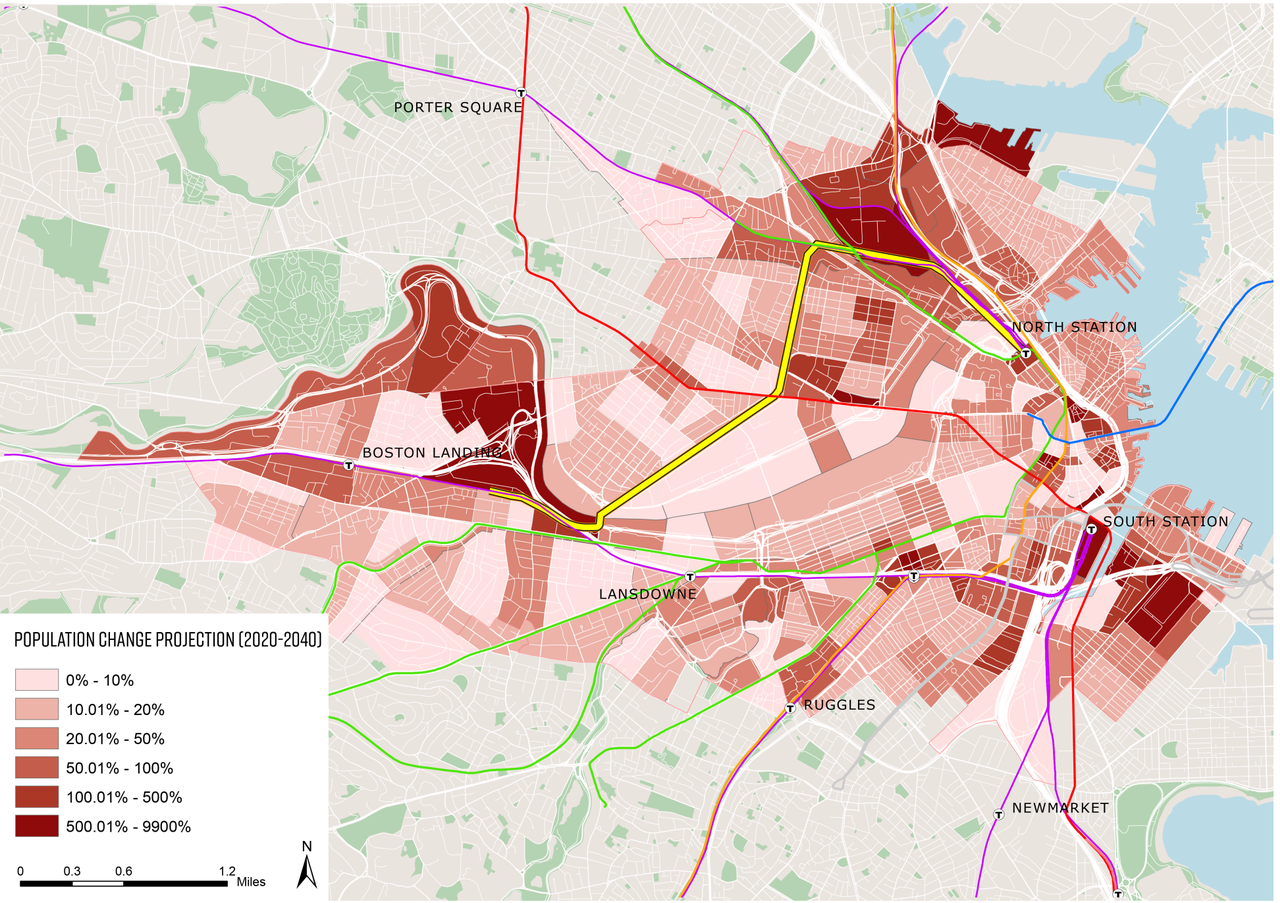
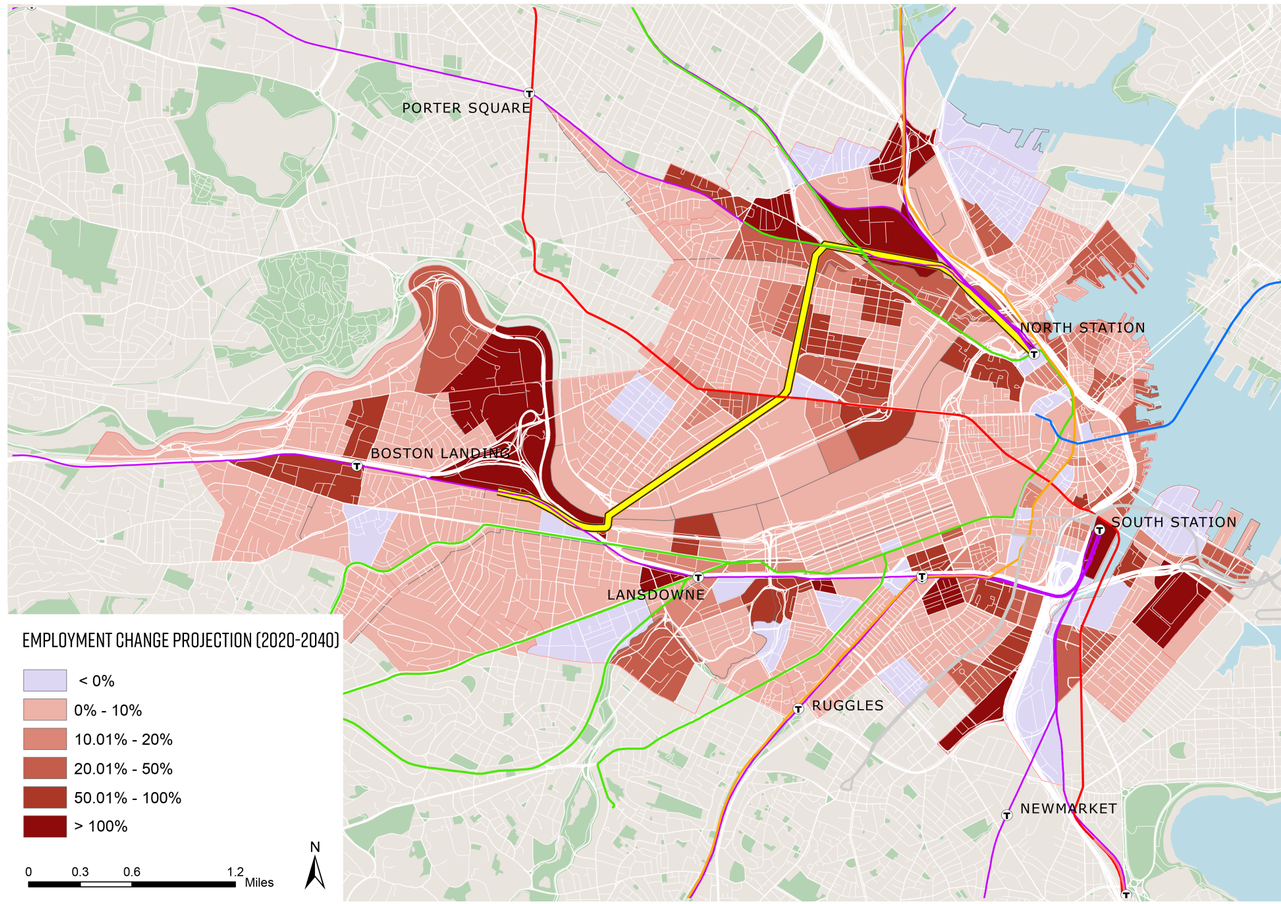
Why this Study?

Planning for the Future

Population Change Projection 2020-2040



Employment Change Projection 2020-2040



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Why this Study?

Our Study's Look at Feasibility:

- Existing Conditions
- Alternatives Development
- Transit Demand Analysis
- Infrastructure Needs and Operational Analysis
- Final Report

Why this Study?

Universe of Alternatives for Consideration / Discussion:

TRANSIT MODE / EQUIPMENT

ROUTE AND TERMINUS LOCATIONS

CAMBRIDGE STATION LOCATIONS

Other Feasibility Considerations:

SINGLE VS. DOUBLE TRACKING

CROSSING LOCATIONS

Some Helpful Definitions

Definition: FRA Compliance

- Any equipment that does not comply with FRA rail requirements will interrupt existing services and will be difficult to implement
    - Grand Junction Corridor currently in use by MBTA, Amtrak, & freight

Definition: Temporal Separation

- Shared use poses safety concerns with vehicles with different magnitudes of crashworthiness.
    - Non-FRA Compliant passenger and freight operations do not operate on any segment of shared track during the same period of time.
    - FRA Compliant passenger and freight operations can operate on the same segment of track at the same period of time.

Definition: Tracking

- How many railroad tracks are there at a given location?
    - Grand Junction Corridor consists of two sections that are single track, and one section with double tracks

Previous Studies

YEAR	PREVIOUS STUDY
Ongoing	Silver Line Extension (SLX) Alt. Analysis (MassDOT)
2019	MBTA Rail Vision (MBTA \ MassDOT OTP)
2022	West Station Area Transit Study (MAPC)
2017	GoBoston 2030 (City of Boston)
2016	Transport Kendall (Kendall Square Mobility Task Force)
2016	Grand Junction Feasibility Review (City of Cambridge)
2015	Better Rapid Transit for Greater Boston (Greater Boston BRT Study Group)
2014	Grand Junction Preliminary Operations Plan for Urban Rail (R. Burckardt)
2014	MIT Property Feasibility Study (MIT)
2012	Grand Junction Transportation Feasibility Study (MassDOT \ CTPS)
2012	Grand Junction Transit Expansion (MIT \ MS Engineering Studio)
2012	Grand Junction Branch Line Study (MIT)
2010	Urban Ring (MassDOT)
2010	Grand Junction Improvement Options (Harvard University)
2006	Grand Junction Rail with Trail (City of Cambridge)
2001	Grand Junction Multi-Use Path (Cambridge Bike Committee)

Previous Modes / Equipment Considered

MBTA Commuter Rail

Jonathan Wiggs / The Boston Globe

Types of Modes: Commuter Rail

Strengths:

- FRA Compliant
- Works with existing rail, especially important for bridge crossing opportunities to the North (Chelsea, Everett, etc.)

Challenges:

- Less frequent service
- No integration with Green Line & other rapid transit connections
- Length of vehicles in an urban setting:
  - Issues with platform length
  - Potential issues with pedestrian crossing
- Unpopular service concept

MetroLine in Austin, TX

Types of Modes: Urban Rail

Strengths:

- FRA Compliant
- Looks like Light Rail, operates on Commuter Rail tracks
  - Works with existing rail, especially important for bridge crossing opportunities to the North (Chelsea, Everett, etc.)
- Shorter vehicle length for urban setting
- Can run on diesel or electric depending on equipment
- More frequent service (15-20 minute headways)

Challenges:

- No integration with Green Line & other rapid transit connections
- Unfamiliar service concept

Previous Modes / Equipment Considered

Union Pearson Express DMU in Toronto, Canada

Craig James White

Types of Equipment: DMU (Diesel Multiple Unit) & EMU (Electric Multiple Unit)

MBTA Red Line

Derek K.

Types of Equipment: Underground Rail Tunnel

MBTA Green Line

Types of Equipment: Light Rail

TransMilenio in Bogotá, Colombia

Types of Equipment: BRT (Bus Rapid Transit)

Previous Modes / Equipment Considered

YEAR	PREVIOUS STUDY	Commuter Rail	Urban Rail	DMUs	Underground Rail Tunnel	LRT	BRT	Multi-Use Path
Ong.	Silver Line Extension (SLX) Alt. Analysis (MassDOT)						X	
2019	MBTA Rail Vision (MBTA \ MassDOT OTP)		E					
2022	West Station Area Transit Study (MAPC)		E				X	
2017	GoBoston 2030 (City of Boston)						X	X
2016	Transport Kendall (Kendall Square Mobility Task Force)		X					X
2016	Grand Junction Feasibility Review (City of Cambridge)	X	D	C, N			X	
2015	Better Rapid Transit for Greater Boston (Greater Boston BRT Study Group)						X	
2014	Grand Junction Preliminary Operations Plan for Urban Rail (R. Burckardt)		D	C				
2014	MIT Property Feasibility Study (MIT)							X
2012	Grand Junction Transportation Feasibility Study (MassDOT \ CTPS)	X						
2012	Grand Junction Transit Expansion (MIT \ MS Engineering Studio)	X		C, N	X	X	X	
2012	Grand Junction Branch Line Study (MIT)	X		C				
2010	Urban Ring (MassDOT)						X	
2010	Grand Junction Improvement Options (Harvard University)	X	D	C			X	X
2006	Grand Junction Rail with Trail (City of Cambridge)	X					X	X
2001	Grand Junction Multi-Use Path (Cambridge Bike Committee)					X		X

Legend:

X = Considered
D = Considered as Diesel
E = Considered as Electric

For DMUs:
C = FRA Conforming
N = FRA Non-conforming

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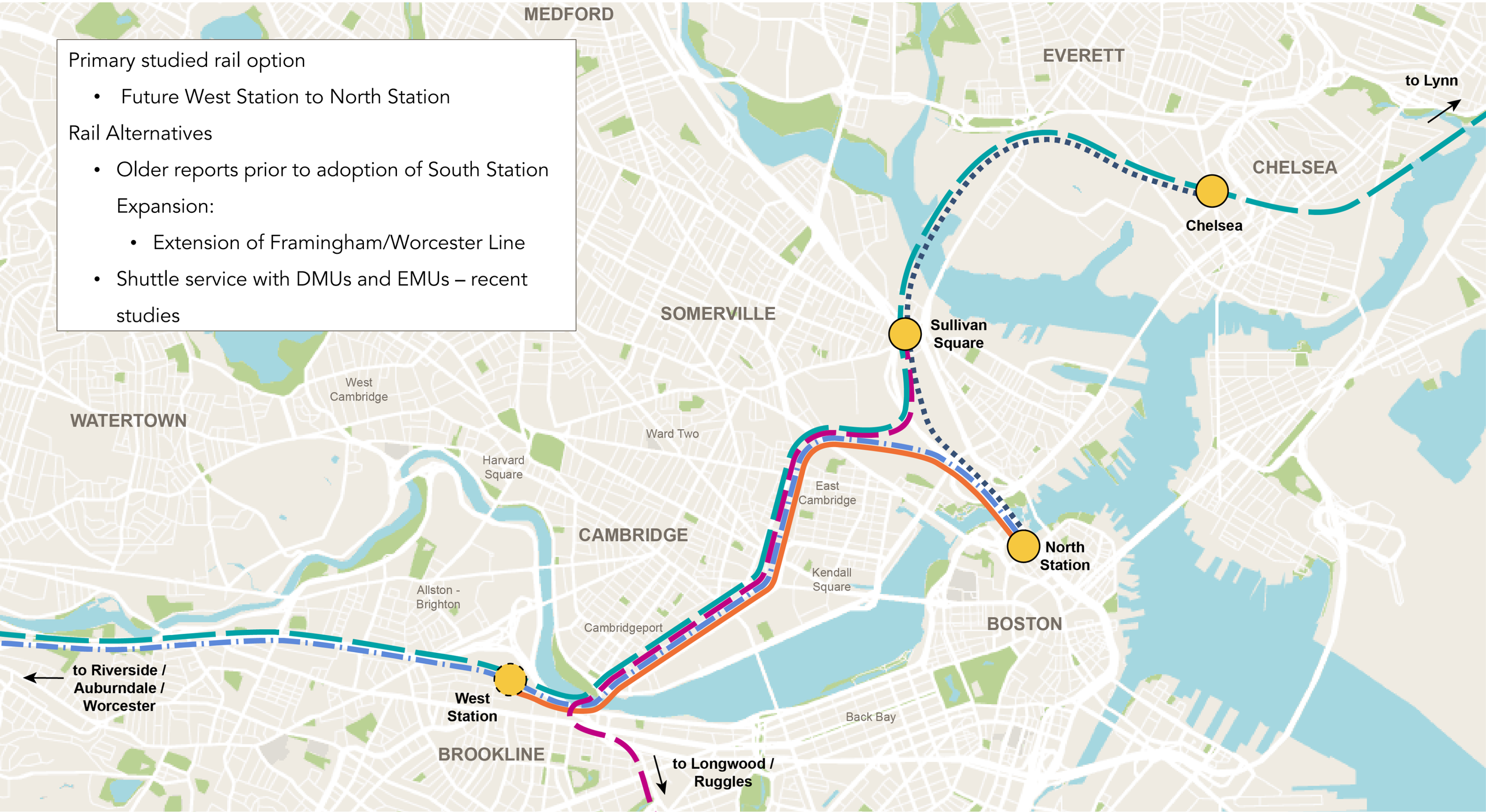
Previous Terminus Locations Considered

Primary studied rail option

- Future West Station to North Station

Rail Alternatives

- Older reports prior to adoption of South Station Expansion:
  - Extension of Framingham/Worcester Line
- Shuttle service with DMUs and EMUs – recent studies



Previous Terminus Locations Considered

YEAR	PREVIOUS STUDY	NORTHERN TERMINUS / SOUTHERN TERMINUS	North Station / West Station	Sullivan Square / Longwood / Ruggles	North Station / Riverside / Auburndale / Worcester	Lynn / Chelsea / Everett / West Station / Riverside	Chelsea / Everett / North Station / Kendall Sq
Ongoing	Silver Line Extension (SLX) Alternatives Analysis (MassDOT)						X
2022	West Station Area Transit Study (MAPC)		X				
2019	MBTA Rail Vision (MBTA \ MassDOT OTP)		X				
2016	Transport Kendall (Kendall Square Mobility Task Force)		X		X	X	
2016	Grand Junction Feasibility Review (City of Cambridge)		X	X	X		
2015	Better Rapid Transit for Greater Boston (Greater Boston BRT Study Group)			X			
2014	Grand Junction Preliminary Operations Plan for Urban Rail (R. Burckardt)		X				
2012	Grand Junction Transportation Feasibility Study (MassDOT \ CTPS)				X		
2012	Grand Junction Transit Expansion (MIT \ MS Engineering Studio)		X		X		
2012	Grand Junction Branch Line Study (MIT)				X		
2010	Urban Ring (MassDOT)			X			
2010	Grand Junction Improvement Options (Harvard University)		X		X		
2006	Grand Junction Rail with Trail (City of Cambridge)		X				

Universe of Alternatives: Mode and Equipment

Options likely **not** feasible based on existing studies:

X Non-FRA Compliant Equipment

Types of Equipment:
Light Rail

X Challenging for FRA Compliance
- Would require temporal separation

Change to rail line is cost prohibitive

Grade changes to connect to existing Green Line stations very challenging

Types of Equipment:
Bus Rapid Transit

X Not FRA Compliant
- ROW too small (rail, multi-use path)
- Would prohibit existing uses

Types of Equipment:
Underground Rail Tunnel

X Creating underground tunnel is cost prohibitive

Corridor too short for partial underground tunnel

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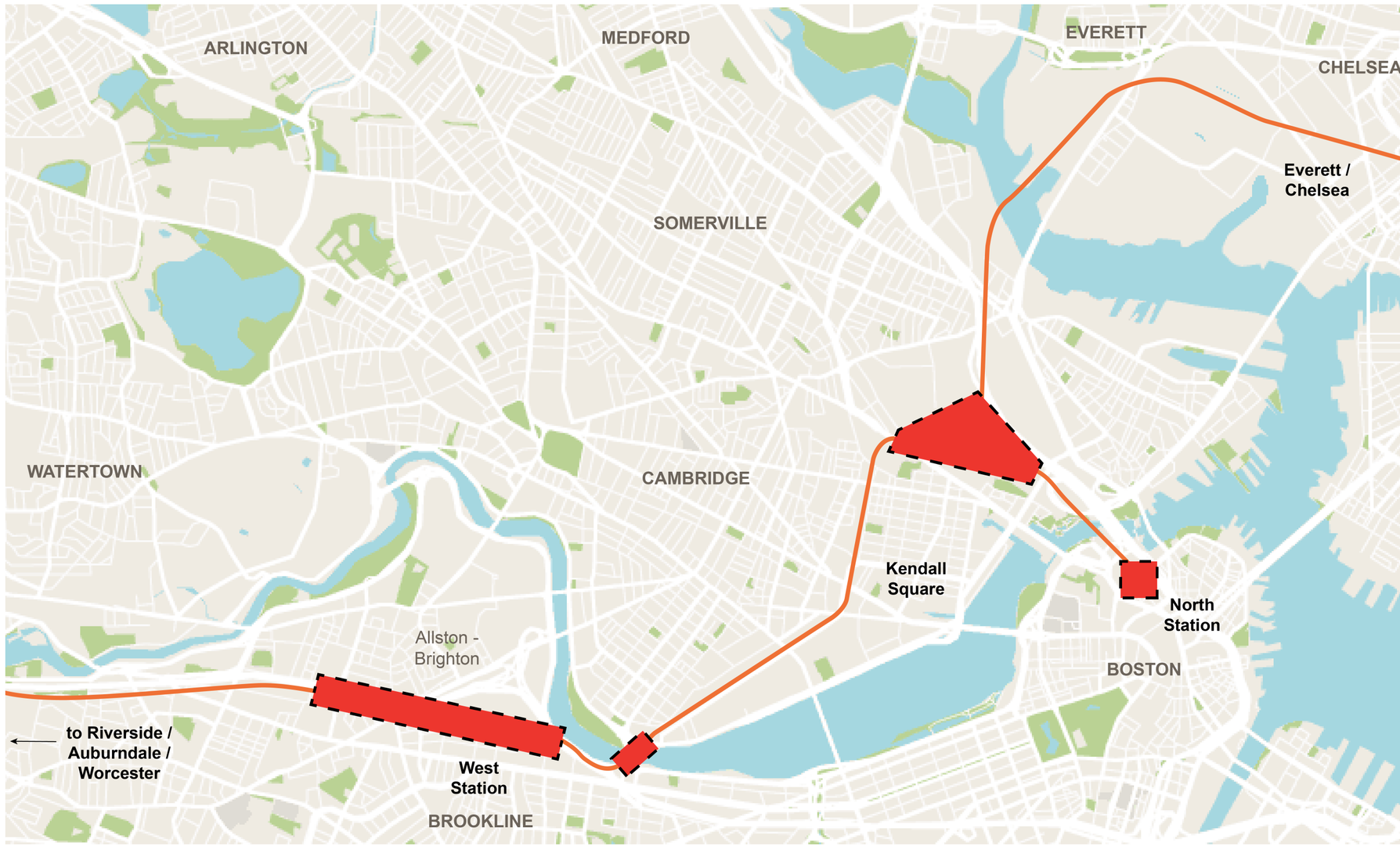
Universe of Alternatives: Terminus Locations

- Many options explored in studies, but not consistent
- Expand options for routes, especially to North and to Lansdowne

Making Transit Connections

- Connections with existing commuter rail tracks in Allston and in Cambridge
- Potential GLX-related constraints
- Existing Charles River crossing near the BU Bridge
- Terminal constraints at North Station



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Ridership Projections

- Potential ridership markets north of Cambridge in Everett, Chelsea, and Lynn

Former MBTA and MassDOT officials celebrate the opening of the Chelsea Station. 2021, MassTransit

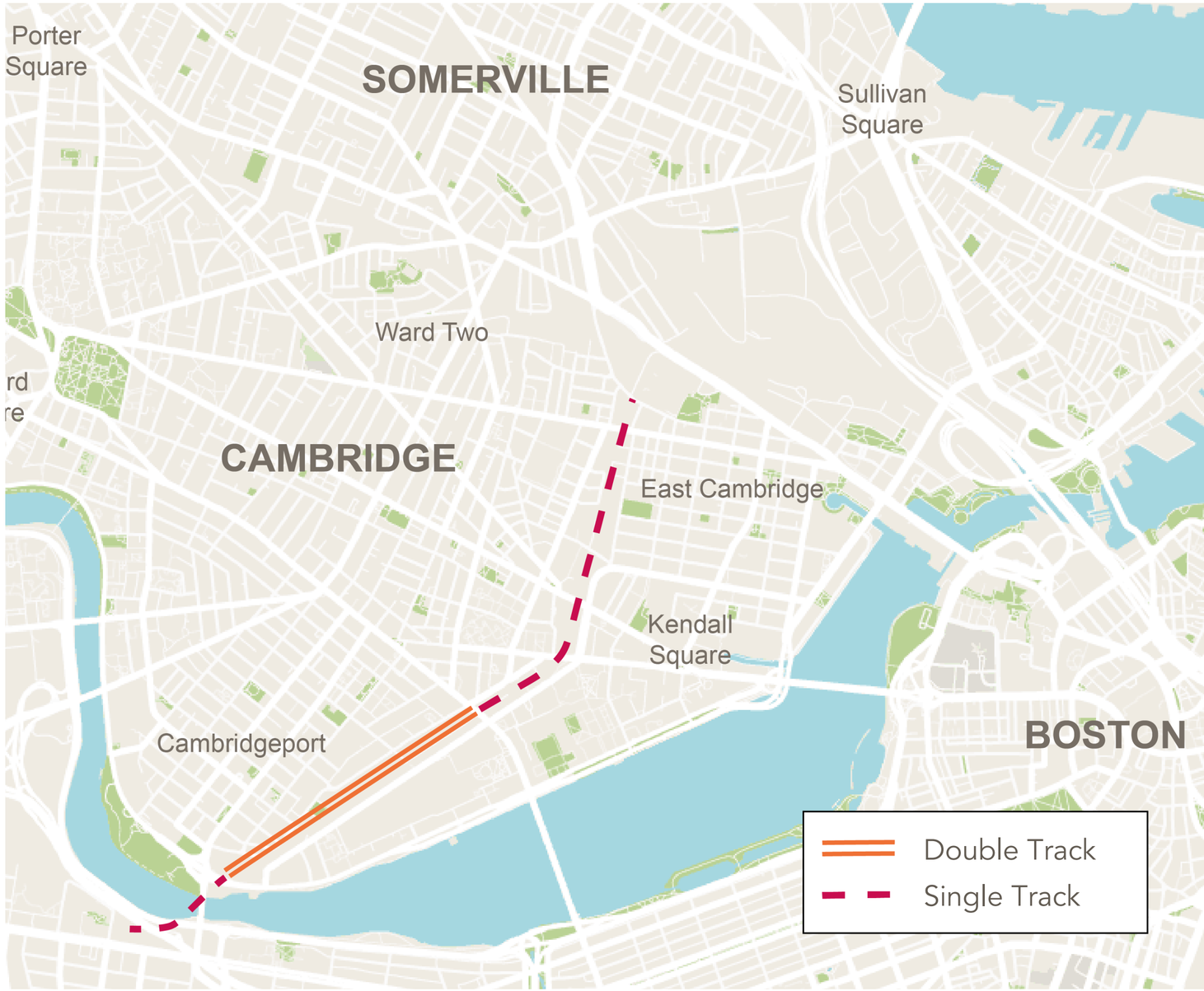
Universe of Alternatives: Cambridge Stations

Station Locations in Cambridge

- Explored in some studies, but not consistent
- Some studies only feature one Cambridge station

Other Feasibility Considerations: Tracking

- Single track may only allow for a single Cambridge station
- Double-tracking could help secure desired 15-minute headways



Other Tracking Considerations

- Location of Path
- Right-of-way
- Station Locations

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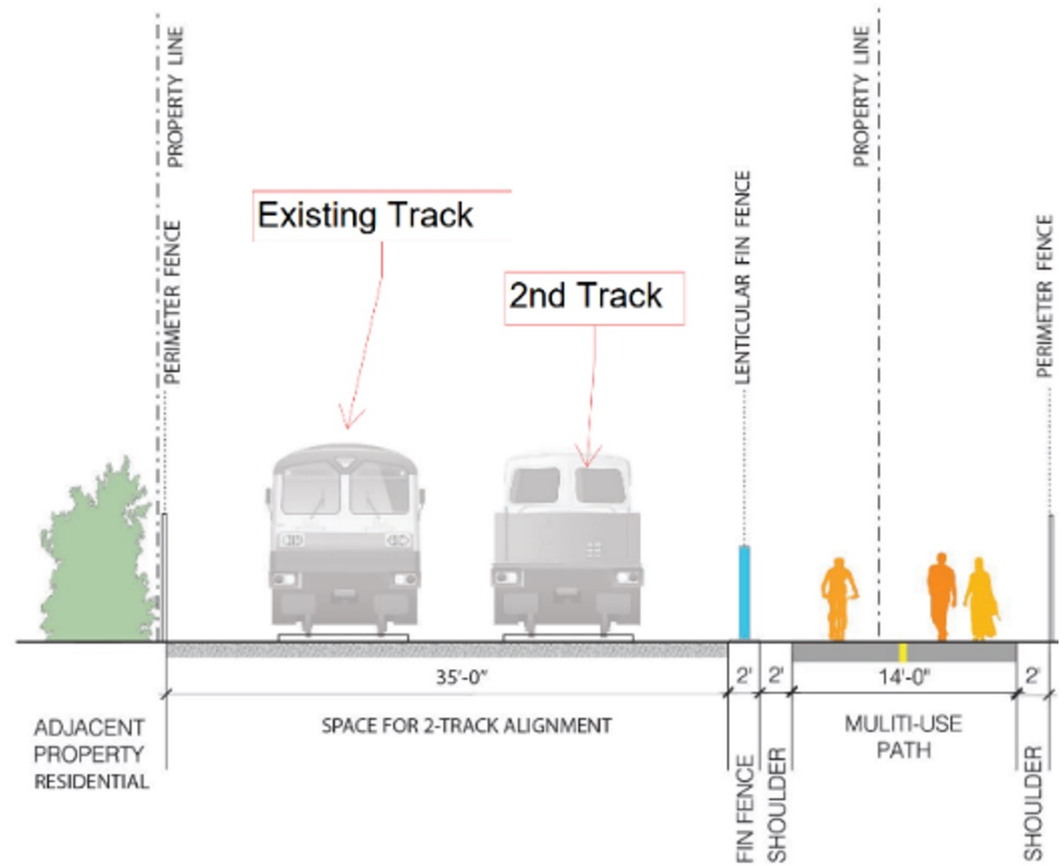
Single vs. Double Tracking

Initial Findings

- Feasibility informed by Multi-Use Path project not precluding double track
- May require shifting of existing track in places
- Tight ROW may preclude center platforms
- Will need to work with partner land owners for access issues at specific points



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Other Feasibility Considerations: Crossings

Grade Crossings Infrastructure

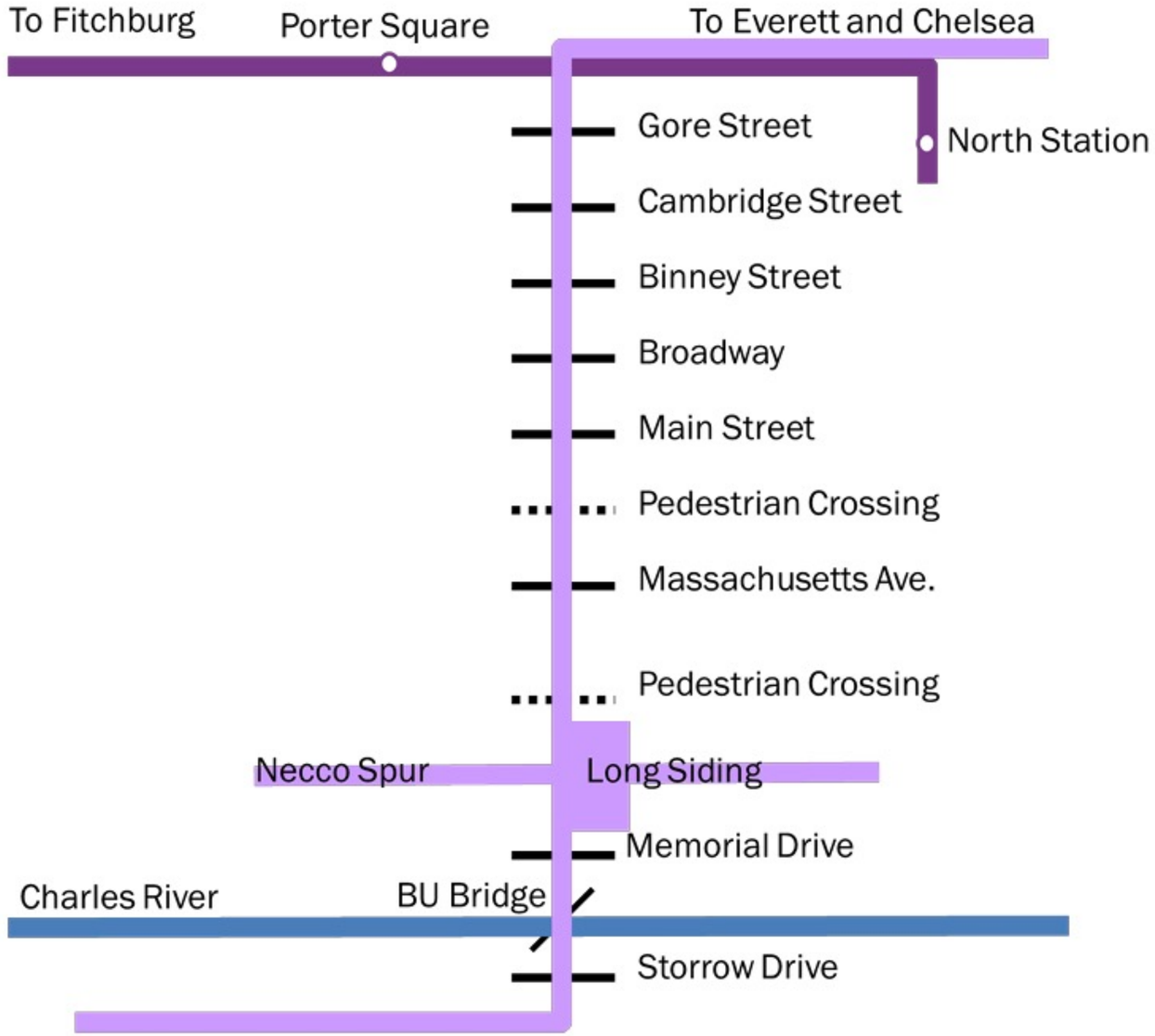
- Signage
- Pavement markings
- Adding gates

Emergency Response Impacts

- Locations of fire, police and ambulance
- Response routes

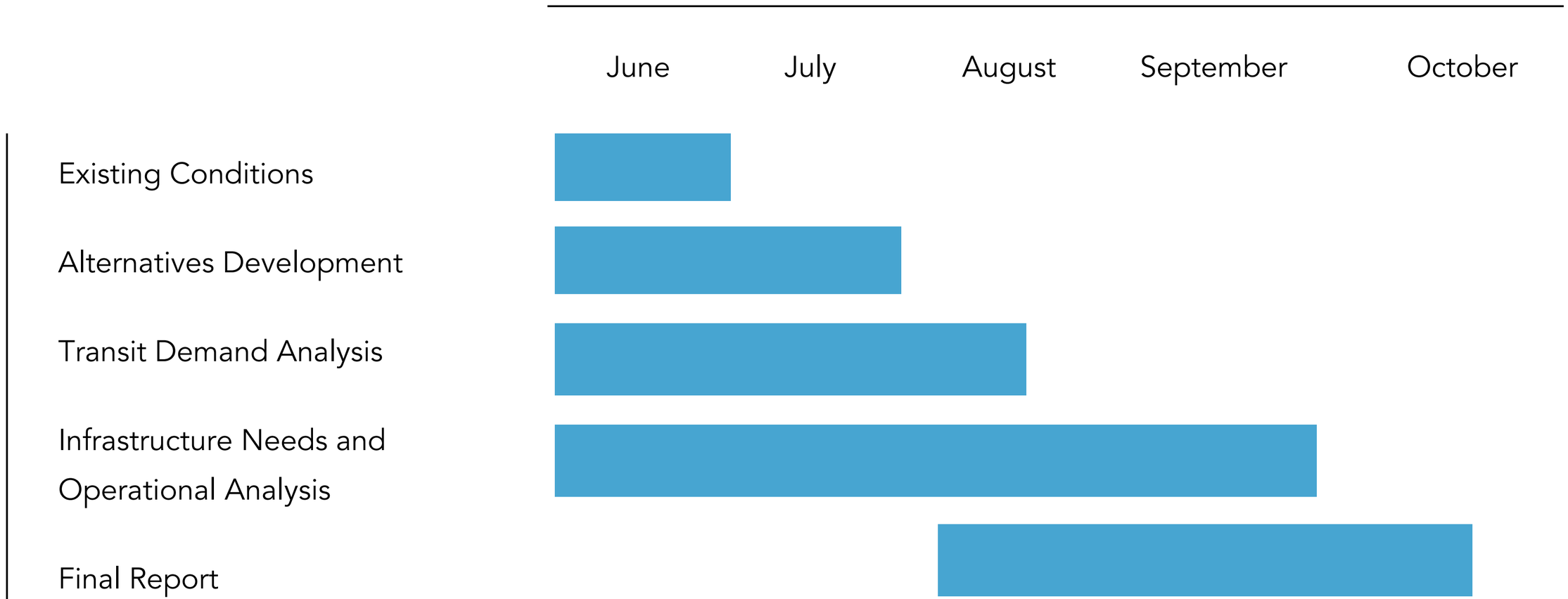
Traffic Impacts

- Conceptual approach – What is likely total time impact per train?
- Interconnection with adjacent traffic signals to reduce potential impacts



Grade Crossings in Cambridge, from Technical Report: Grand Junction Feasibility Review, City of Cambridge (2016)

Remaining Project Schedule



Discussion

Universe of Alternatives:

TRANSIT MODE / EQUIPMENT

Supported by findings:

- Urban Rail

Other options:

- Commuter Rail
- Light Rail

ROUTE AND TERMINUS LOCATIONS

West:

- West Station
- Lansdowne
- Riverside
- Worcester

East:

- North Station
- Sullivan Square
- Everett / Chelsea / Lynn

CAMBRIDGE STATION LOCATIONS

- Cambridgeport
- Mass Ave / MIT
- Kendall Square
  - at Main Street
  - at Broadway
  - at Binney St
- East Cambridge
- North Point / Cambridge Crossing