

SL – Extension

Alternatives Analysis

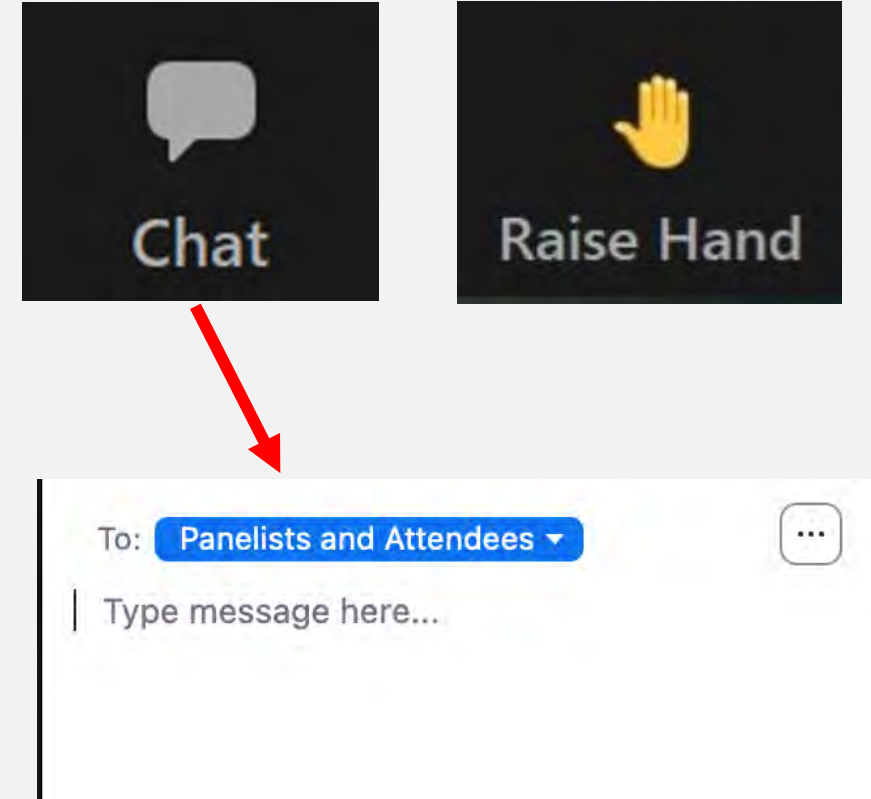
Working Group Meeting #2

March 29, 2021



Working Group Participation

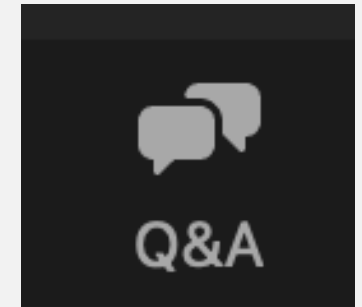
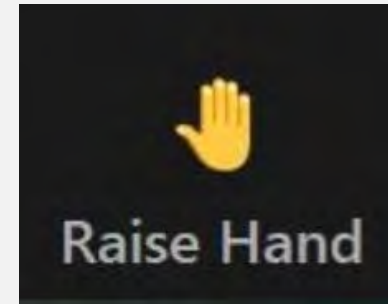
- Press the **Raise Hand** button. Please wait for the moderator to recognize you before unmuting yourself and speaking.
- During the discussion of alignments, please share typed feedback in the **Chat** feature. Be sure to select **To: Panelists and Attendees**.



***Note:** if you are not using the latest software of Zoom, you may have to click the **Participants** button to access the Raise Hand feature.*

Public Comment

- Please share only one question or comment at a time
- Use the “**Q+A**” button to submit a typed question or comment
- Press the “**Raise Hand**” button to share your question or comment verbally. Wait for the moderator to recognize and unmute you before speaking.
- If you have joined by phone only, you may “raise your hand” by pressing the star button and then nine (*9)
- *After you speak, we will lower your hand and you will be muted to allow the team to respond and provide opportunities for others to participate*
- Comments may also be sent to SLX@mbta.com.



Chat is reserved for
Working Group only

Members of the public:
*please use the Q&A
feature*

AGENDA

01 | Welcome

02 | Project Update

03 | Goals & Objectives/
Existing Conditions

04 | Potential Alignments

05 | Upcoming Public Outreach

06 | Next Steps

Meeting Purpose

Our goals for today's meeting are to review existing conditions and discuss alignments to consider.

Project Update

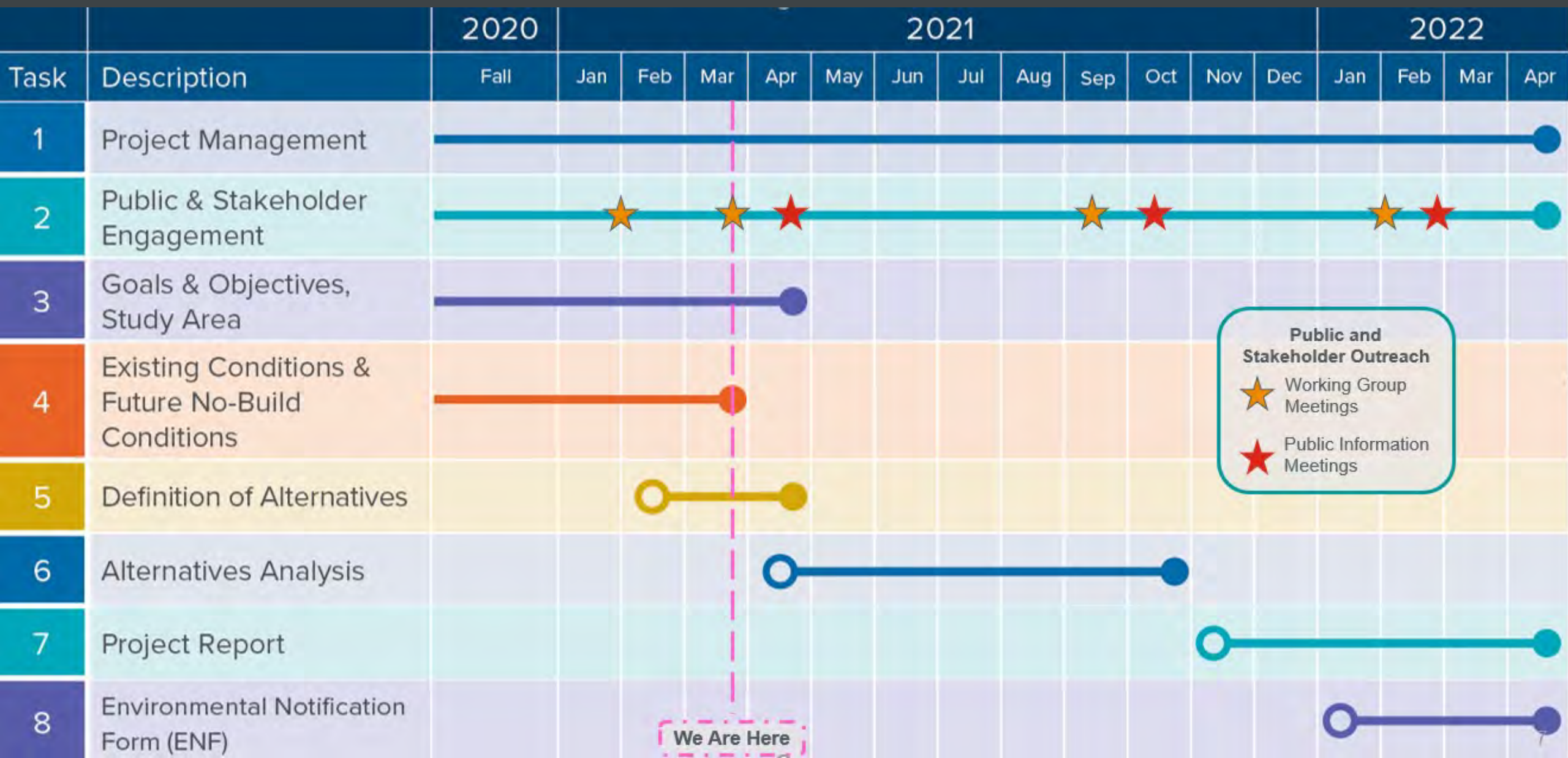
Efforts Completed Since our Last Meeting

Progress Since Our Last Meeting

Since last month's meeting, the Silver Line Extension team has:

- Completed the Existing Conditions analysis
- Defined the evaluation framework around draft Goals and Objectives
- Identified preliminary route alignments for evaluation

Project Schedule



Upcoming Engagement

- **[Virtual] Public Meeting #1 (Tuesday, April 27)**
Project introduction and overview of existing conditions, draft evaluation framework, and initial concept alignments
 - Outreach will begin this week (website update, eblast, flyers, etc.)
 - Presentation followed by breakout groups to discuss concept alignments
 - Spanish interpretation will be provided; other interpreter services provided on request
- **Online Feedback Form and Interactive Map (Available Mid-April)**
 - Feedback on draft project purpose, goals and objectives
 - Feedback on potential alignments to be considered
- **Ongoing Meetings**
With municipal officials and community stakeholders

Project Coordination

- We continue to coordinate with other related efforts and projects within the study area
 - Bus Network Redesign
 - MBTA Bus Facility Modernization Program
 - Wellington Circle Study
 - Sweetser Circle Study
 - McGrath Boulevard Project

Bus Fleet and Facility Modernization Program

- November 23, 2020: FMCB voted to authorize the procurement of 45 New Flyer sixty-foot buses to replace the existing dual-mode fleet
 - Anticipated to be delivered in 2022
 - The SLX team is analyzing the ability of the new fleet to serve any potential extension of the Silver Line
 - With the delivery of these buses the Southampton Maintenance Facility will be at capacity
- Bus Facility Modernization Program is advancing design work and property acquisition to support modernization of the bus fleet and address capacity limitations
 - Additional storage and maintenance capacity will be required in order to expand the Silver Line Fleet
 - Early planning work underway for a new northside facility
 - The full facility plan is critical for electrification of the bus fleet

Bus Network Redesign (BNRD)

- A complete re-imagining of the MBTA's bus network to better reflect the travel needs of the region and create a more competitive bus service for current and future bus riders.
- High Frequency Corridors, corridors with high travel demand made by transit critical populations that warrant high frequency service, will be identified in April 2021 to begin discussions with municipal partners on potential future transit priority treatments
- SLX will work with Bus Network Redesign team to identify opportunities for coordination on High Frequency Corridors as well as other improvements to the network

Existing Conditions

How Does the Study Area Perform Today?

Existing Conditions Analysis Purpose

We do an Existing Conditions analysis for a few reasons

- We want to make sure we understand how the system is used today so that our recommended changes are truly improvements
- Sets the context of where our work is, in relation to all the work that has been done before
- All the data we compile serves as a baseline for our future work
 - Creating alternatives
 - Evaluating alternatives
 - Making a recommendation on preferred alignment

Project Purpose

The purpose of the Silver Line Extension Alternatives Analysis is to assess the feasibility, utility, and cost of various alignment and service frequency options of an extension of the Silver Line, providing high quality transit from Chelsea through Everett and on to Somerville, Cambridge and/or Boston.

Updated Project Need

- This project's objective is to add transit service capacity and connectivity that will knit together Chelsea and Everett with nearby communities that are not currently well connected with high-quality transit.
 - Existing transit service is not competitive with driving for many types of trips being made to and from Chelsea and Everett.
 - Despite the lack of competitiveness, bus ridership in Chelsea and Everett during the pandemic has been more durable than in other communities.
 - Chelsea, Everett, Somerville, and Cambridge are experiencing rapid growth in housing and employment in areas that are not currently well served by transit.
 - There are existing transit connections in Chelsea, Everett, and nearby communities that could be leveraged and improved into a high-quality cohesive network.

Our Proposed Evaluation Process



Review a wide host of ideas
and remove all those that
don't meet the project's
purpose

We Are Here

Section A



Section B



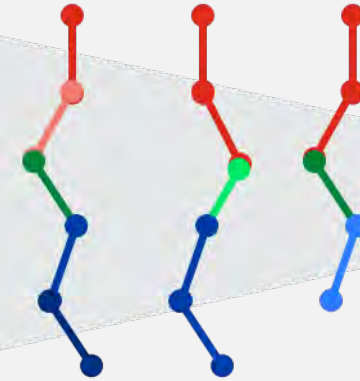
Section C



Test different alignments
within each section

NOTE: Alignments shown
above are illustrative, and not
intended to represent any
specific alignments!

Entire Route



Test best alignments as
complete route

LPA

Screening Process

- Asks a set of simple YES or NO questions.
- The questions are framed so that they do not require significant data collection or analysis to answer.
- Screening criteria are based on existing or readily available data and may reflect regulatory or policy imperatives.
- If the answer is NO to any of the questions the concept is considered infeasible and is removed from further consideration.
- If the answer is YES to all the questions the concept is forwarded onto the Tier 1 Evaluation.

Screening Questions

1. *For alignments within Chelsea and Everett:* Does the concept either create new or improve existing transit connections between and/or within Chelsea and Everett?
2. *For alignments outside of Chelsea and Everett:* Does the concept create new or improve existing transit via connecting Everett to the Orange Line, Somerville, Cambridge, and/or Boston?
3. Does the concept serve the identified needs of transit-critical populations?
4. Does the concept avoid displacing the dwellings of any transit-critical populations?
5. Does the concept provide a relatively direct line of travel?
6. Is this concept compatible with local plans and/or priorities?
7. Is this concept feasible from an engineering perspective?
8. Can the concept be permitted from an environmental perspective?

WORKING GROUP DISCUSSION

1. Do these screening questions make sense to you?
2. Are there any that you would recommend removing?

Our Goal Areas

The major themes that will guide our work



Expand Mobility
and Access



Advance Equity



Improve Safety



Support Climate
Change
Resilience and
Sustainability

Key Takeaways

1

Everett and Chelsea have the demand and demographics to support high-frequency, high-capacity transit service

2

Everett residents have less access to regional activity centers than residents in adjacent communities

3

Existing transit network constraints and congestion play a role in that lack of access

4

A Silver Line extension and other transit priority investments could help address the gap

Expanding Mobility and Access

Access, Connectivity, Reliability, Effectiveness



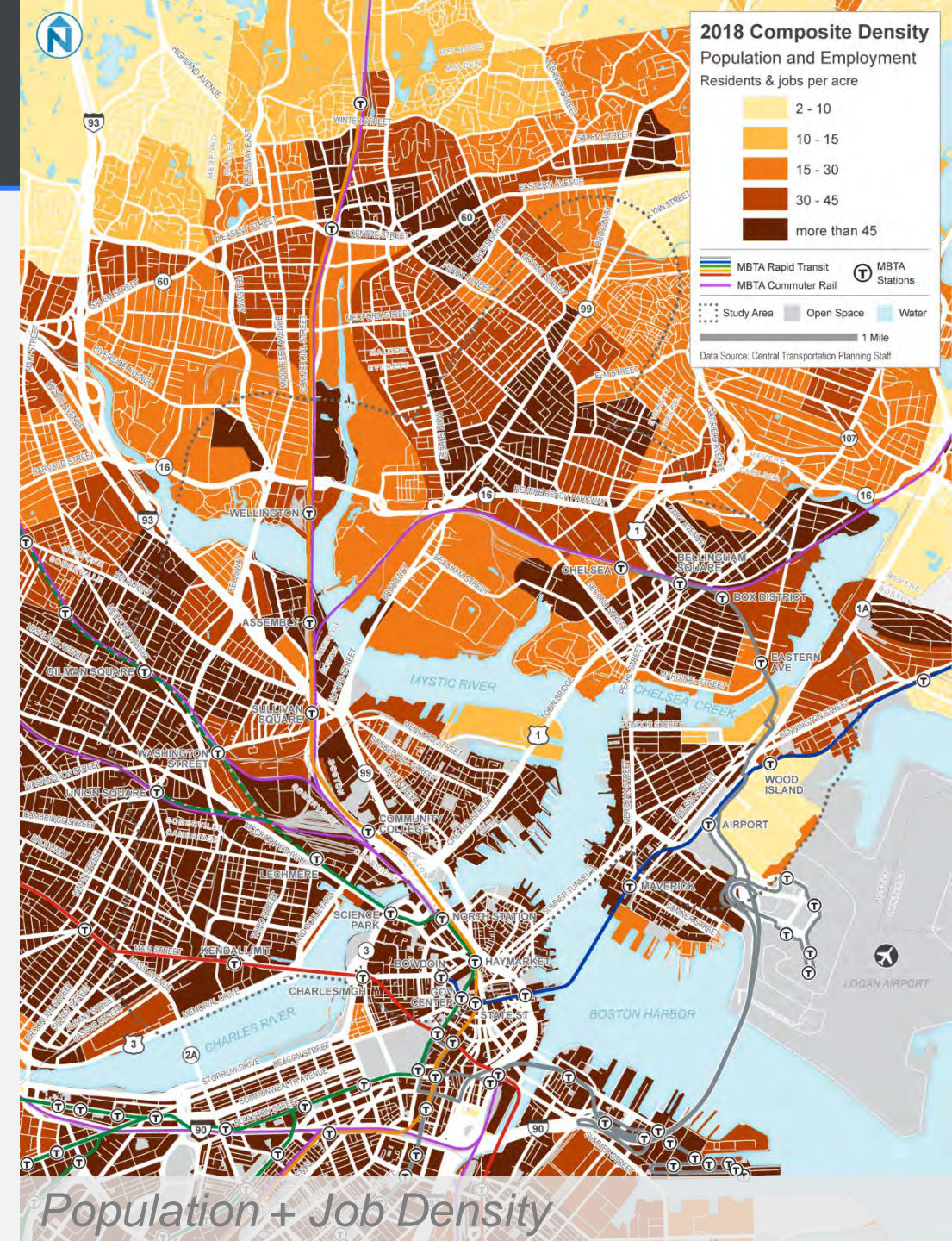
Existing Population and Jobs

Communities in our study area have the density to support frequent, all-day transit service

	Total (2018)	Density(per Acre)
Population	181,000	23.1
Jobs	138,000	17.6

Excluding Downtown Boston and Logan Airport

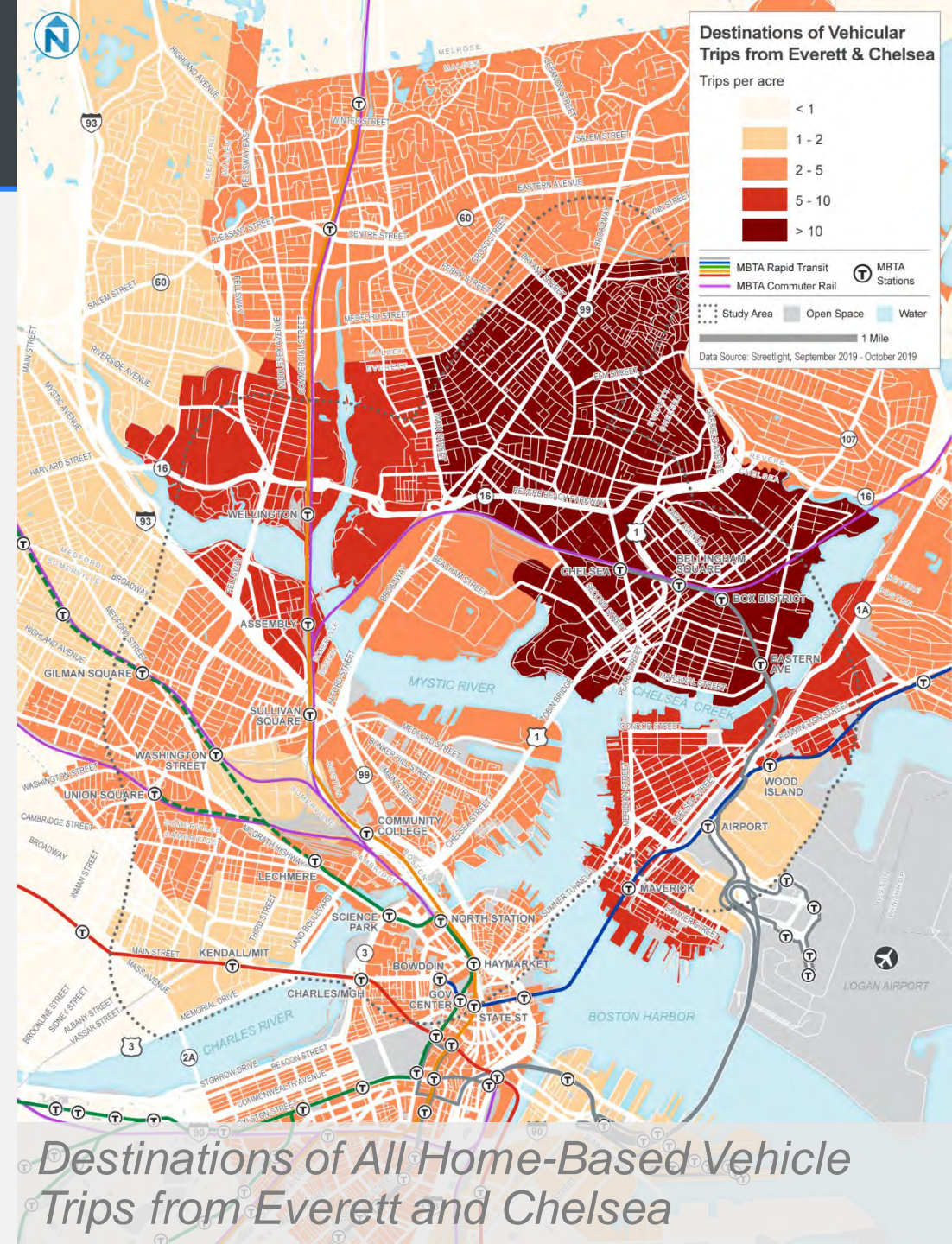
Source: MAPC/CTPS Estimates, 2018



Travel Flows – All Vehicle Trips

Within the Inner Core, most trips from Everett and Chelsea are local

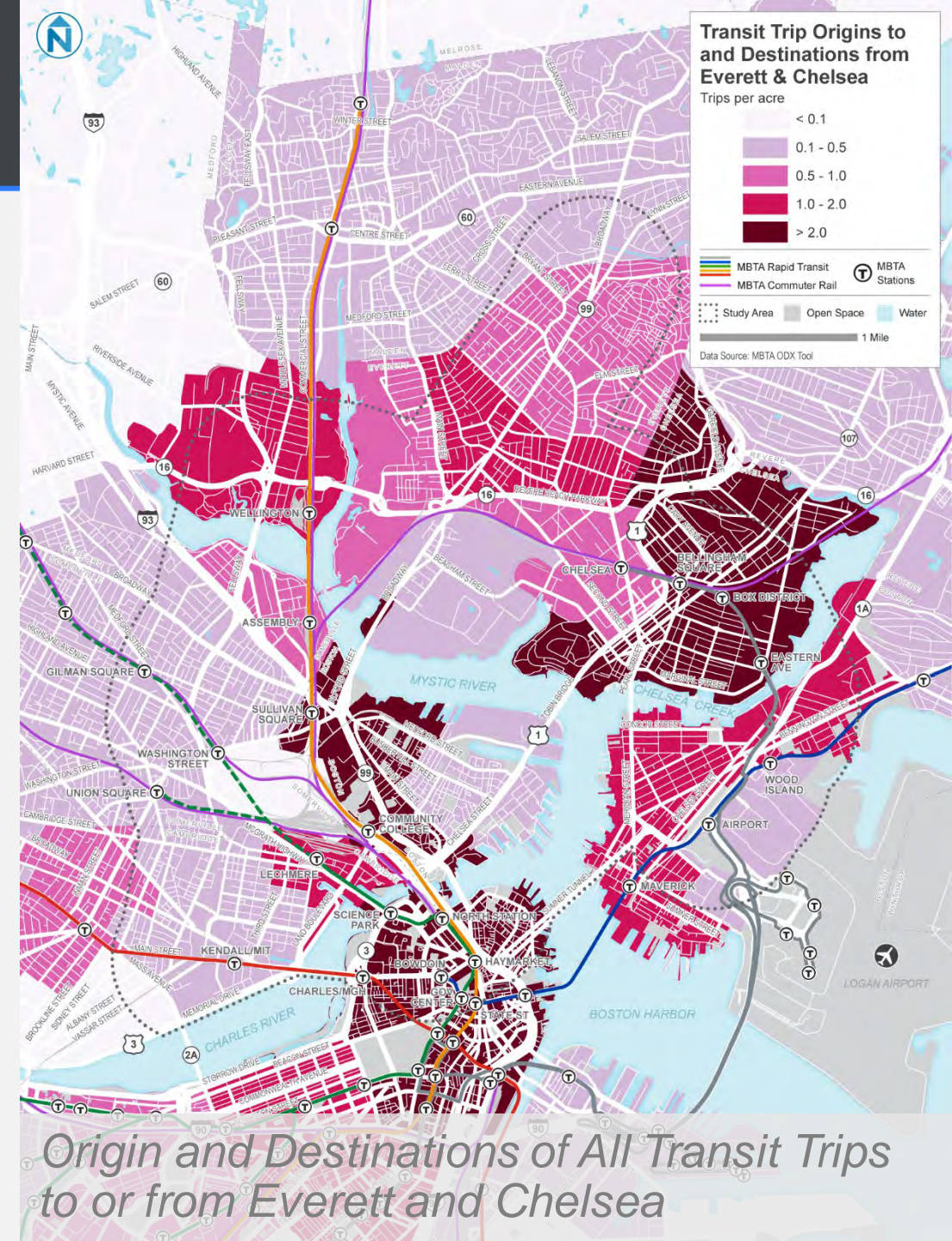
- 44% of trips (auto and transit) begin and end in Chelsea or Everett
- 27% of trips end in Revere, East Boston, or Malden
- Downtown (4%), Logan (2%), and Back Bay (1.5%) are top major business districts



Travel Flows – Transit Trips

Downtown is the top destination for Everett and Chelsea transit riders

- 24% of transit trips from Everett and Chelsea end in Downtown
- 23% begin and end in Everett and Chelsea
- Other top employment centers are Back Bay (5%) and LMA (4%)
- No data from SL3 due to free fares

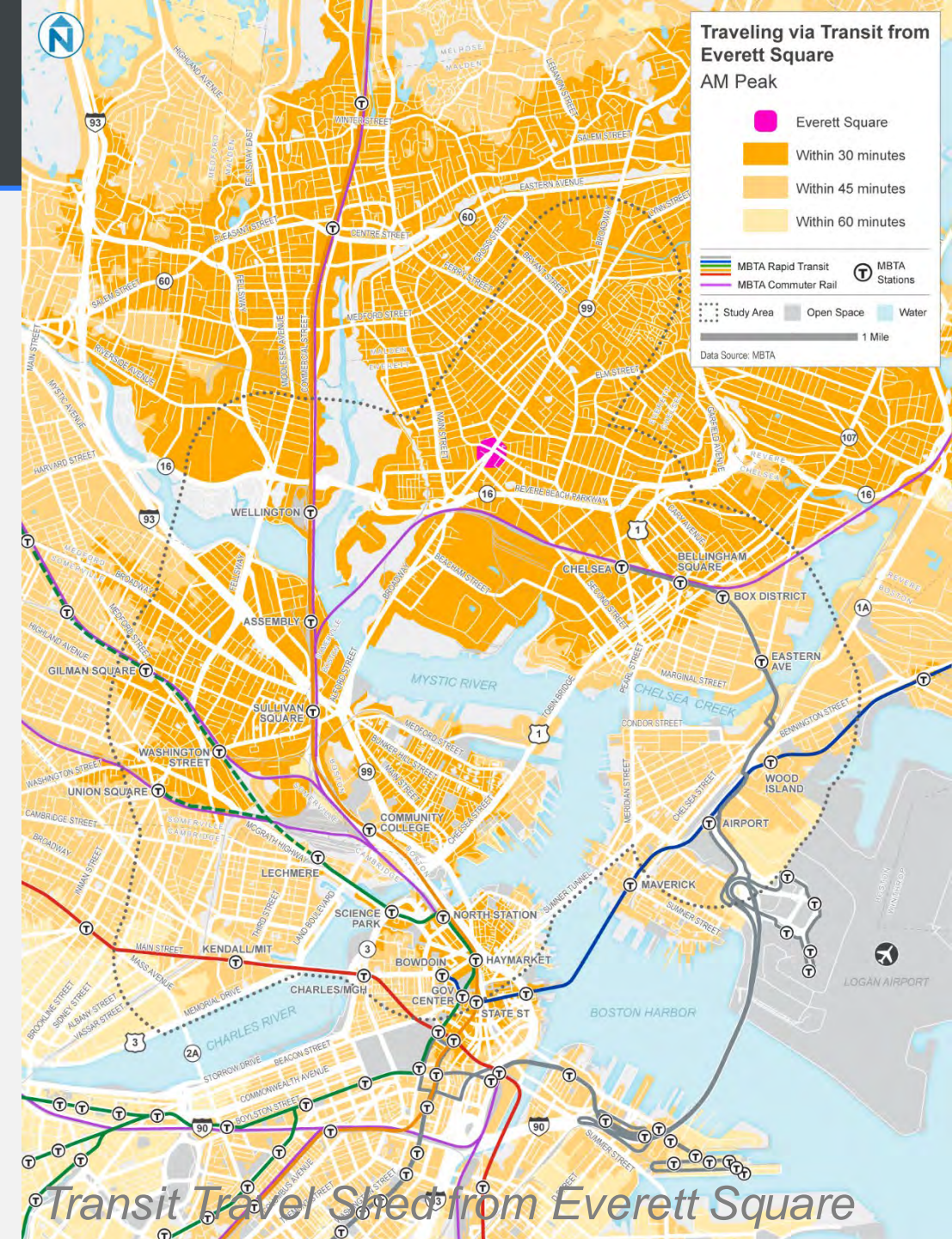


Transit Access - Travel Time

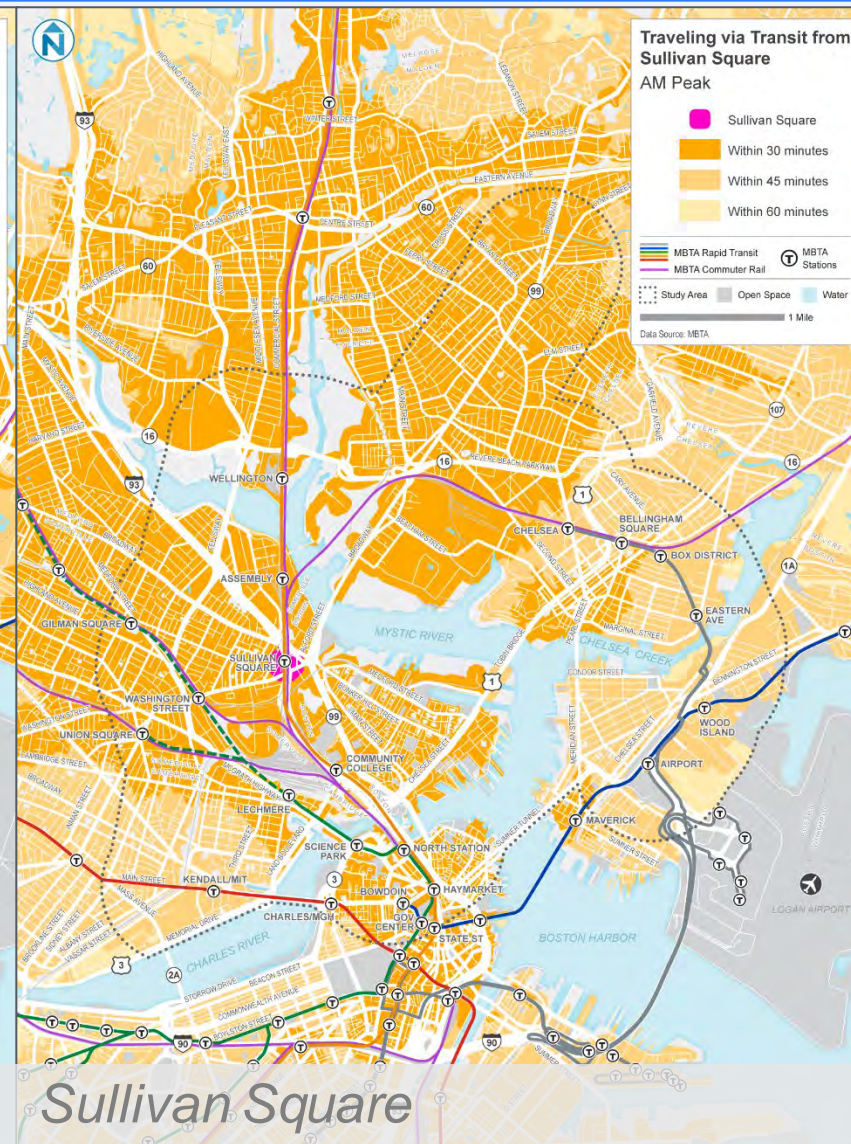
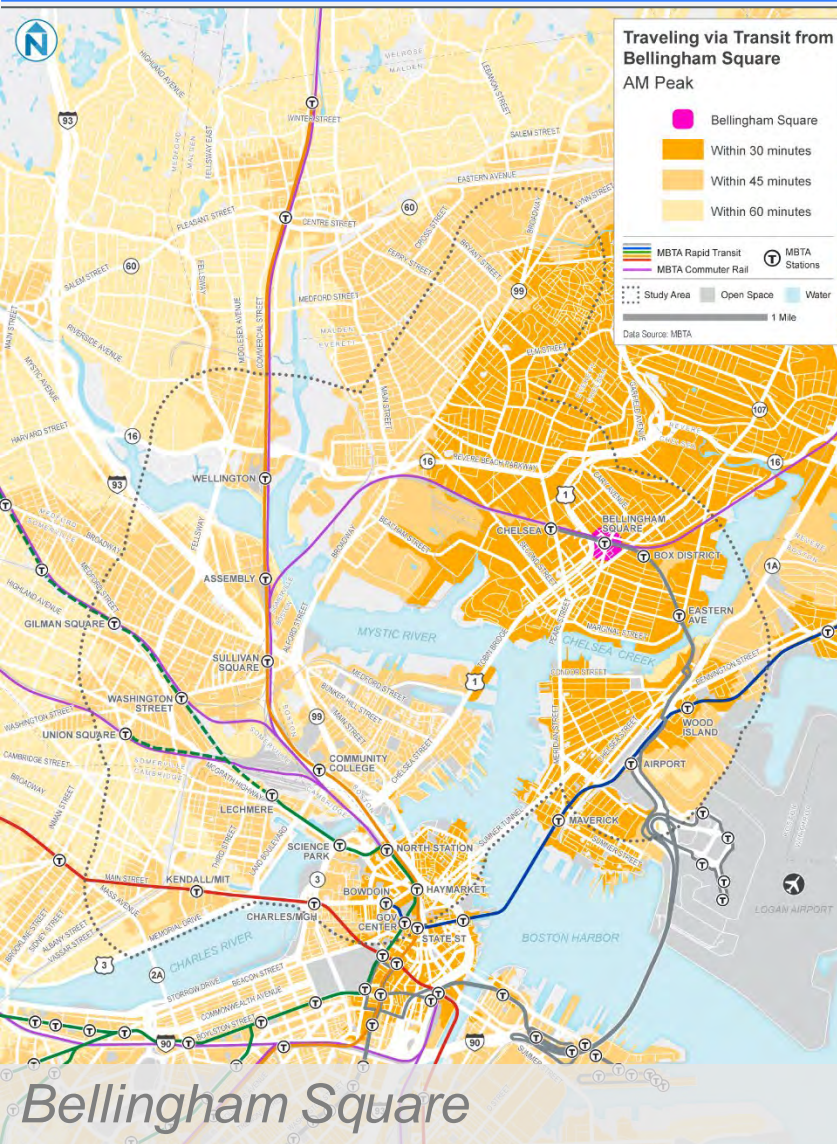
Transit trips between major study area locations can take 30 minutes or longer

Bellingham Square	31 min	Everett Square
Bellingham Square	43 min	Sullivan Square
Glendale Square	56 min	Kendall Square
Everett Square	59 min	Logan Airport (A)

Source: MBTA Winter 2020 GTFS, Network Analyst Travel Times at 8am



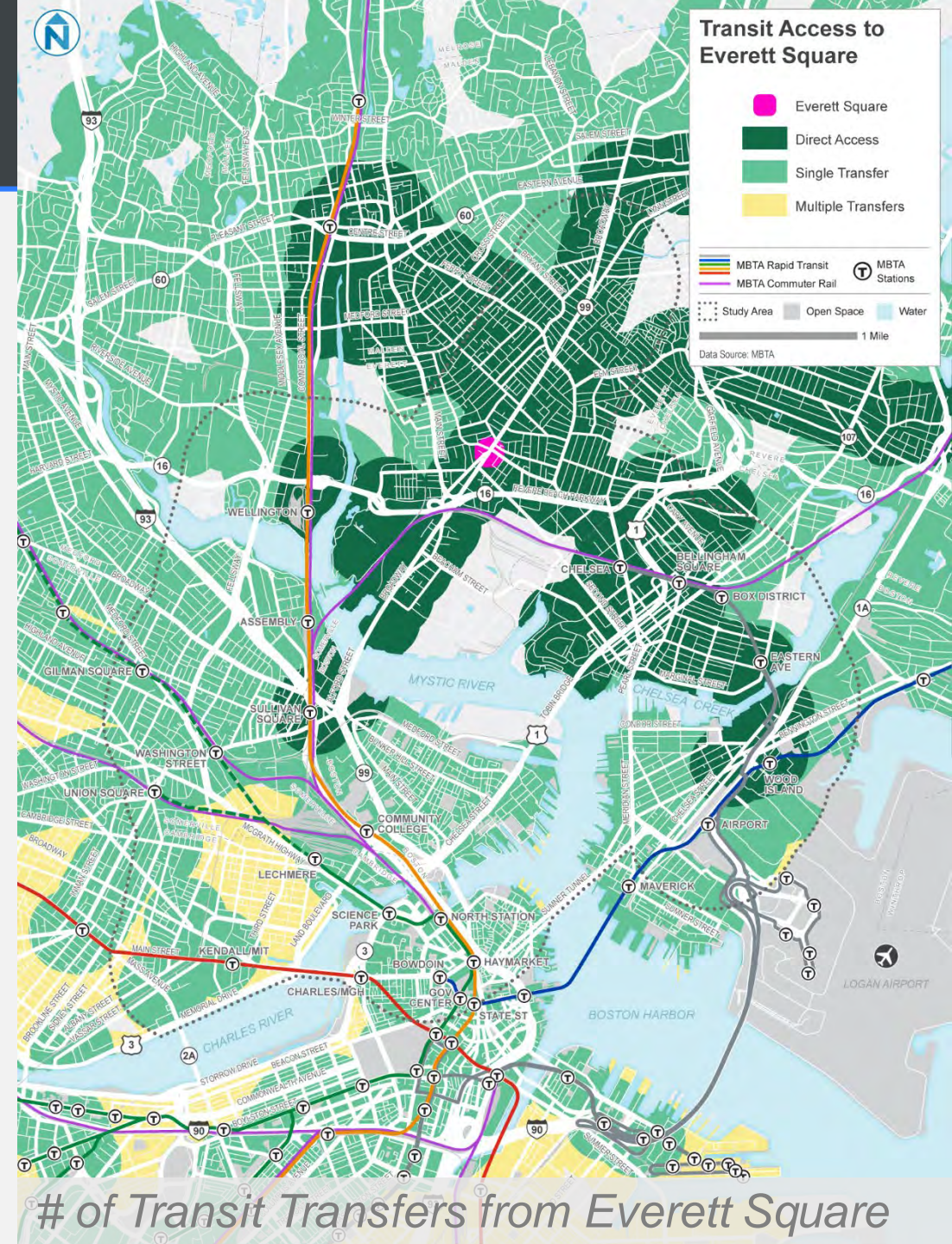
Transit Access – Travel Time



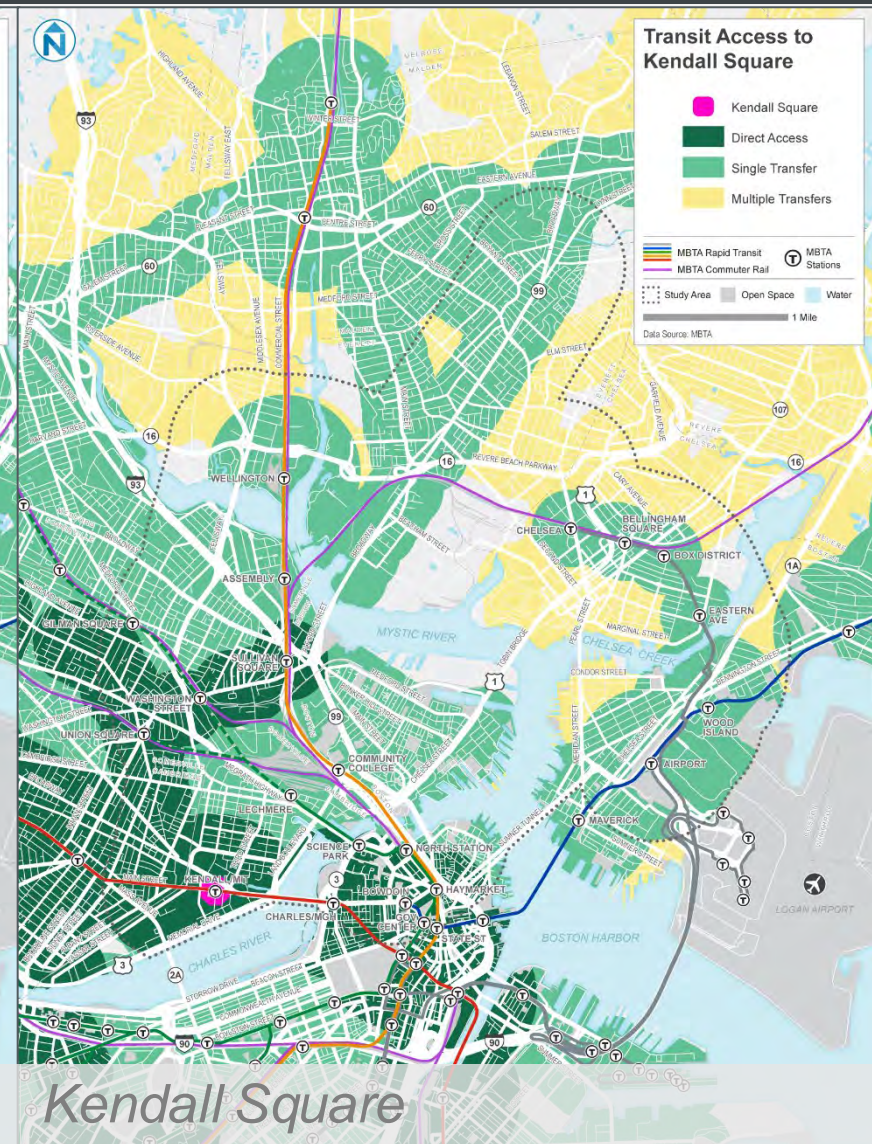
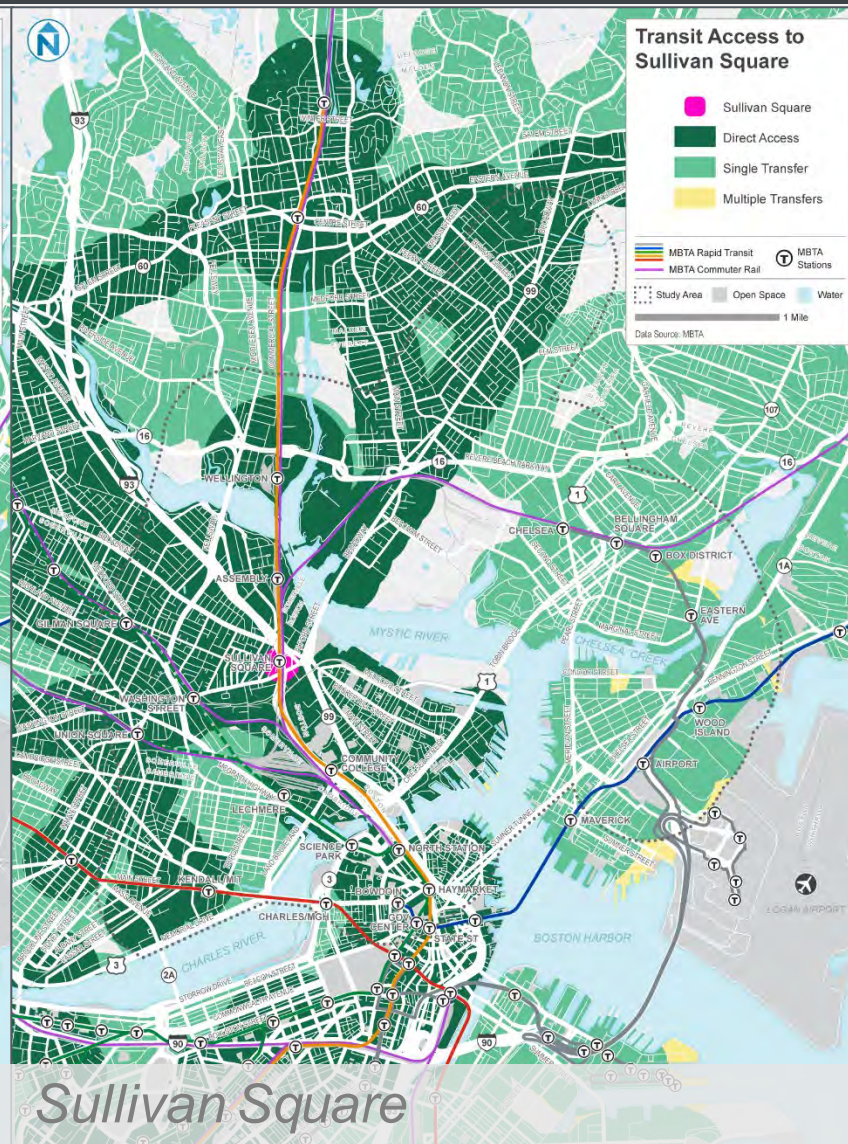
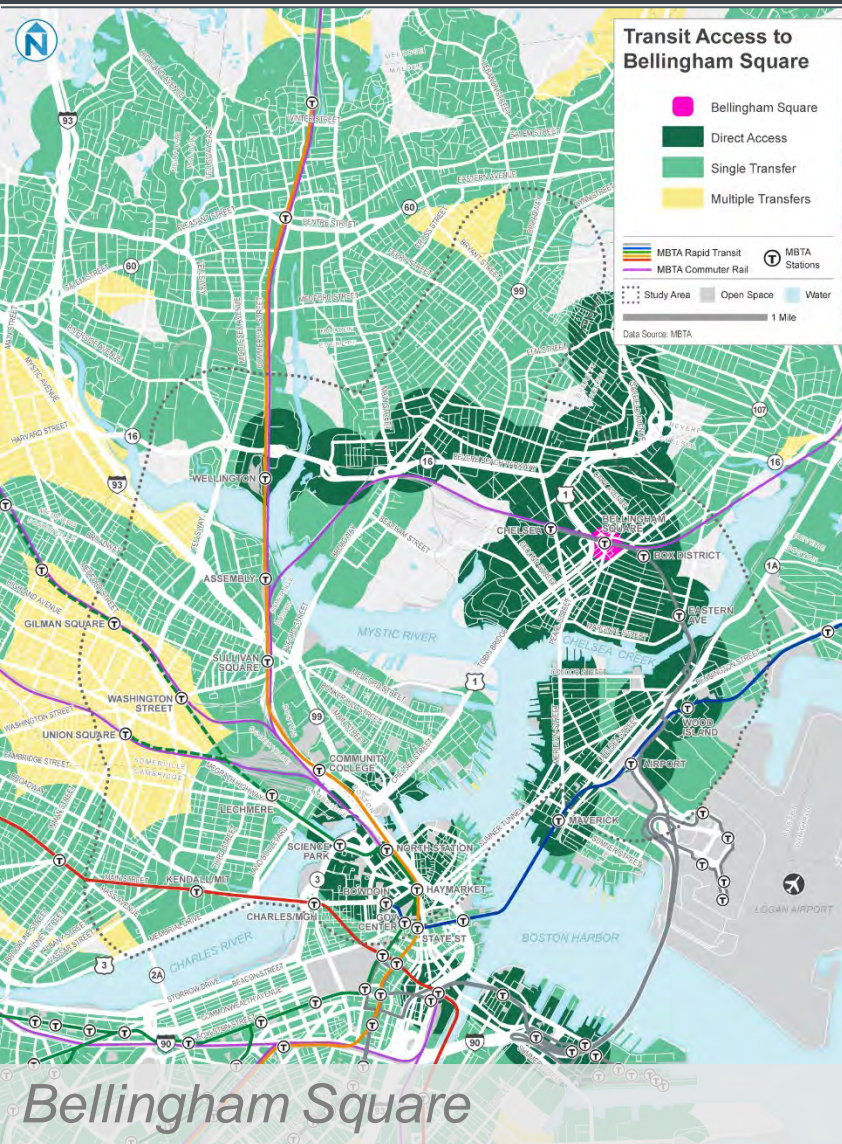
Transit Access – Transfer

Trips between major study area locations often require one or more transfers

- Most Everett service ends at Orange Line
- No direct transit option between Chelsea and Kendall Square
- Critical transit links operate infrequently
 - Route 112: every 40 min
 - CT2: every 20-30 min

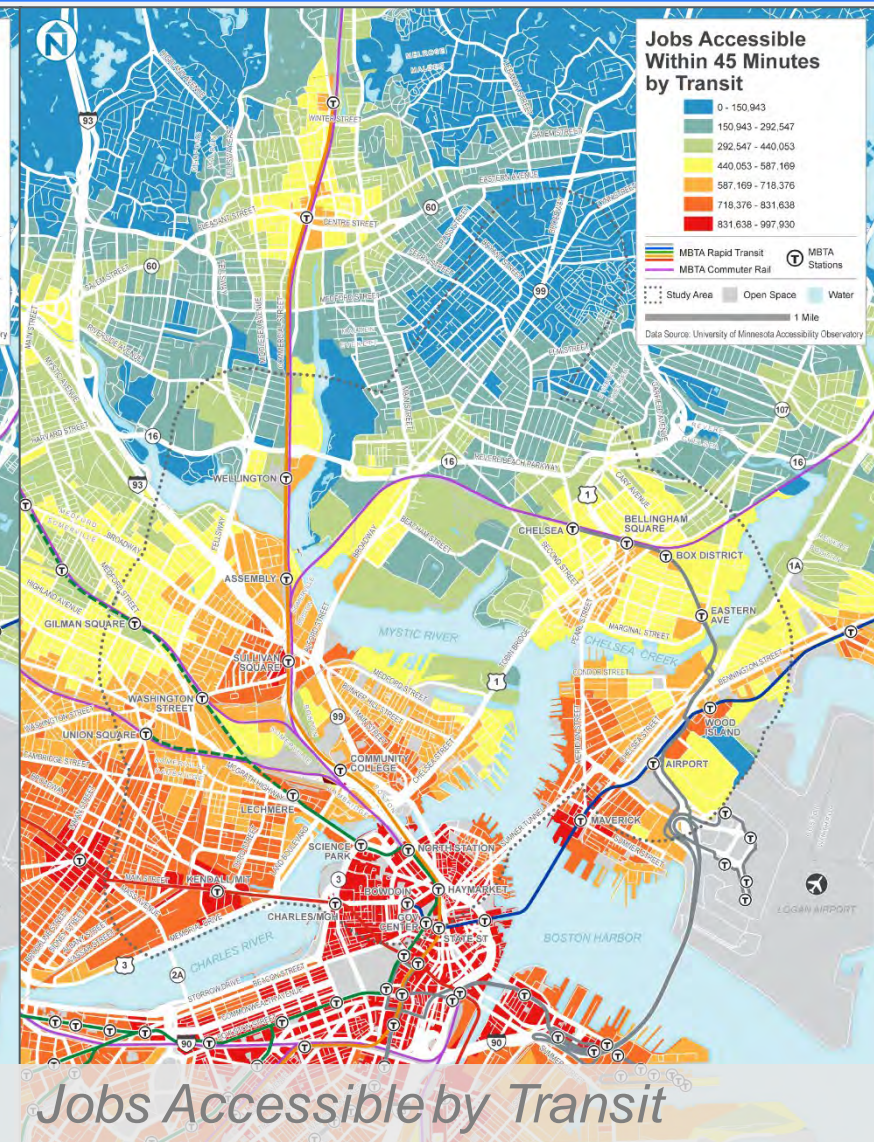
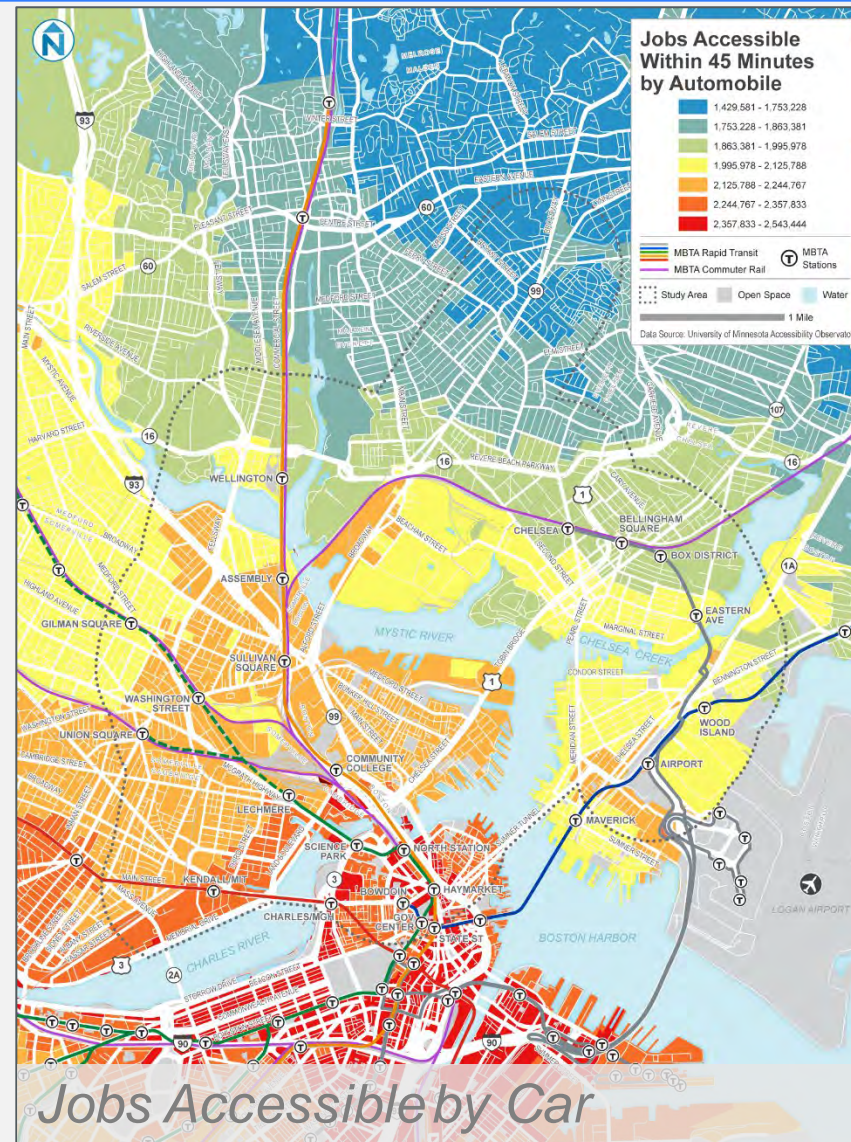


Transit Access – Transfers



Job Access

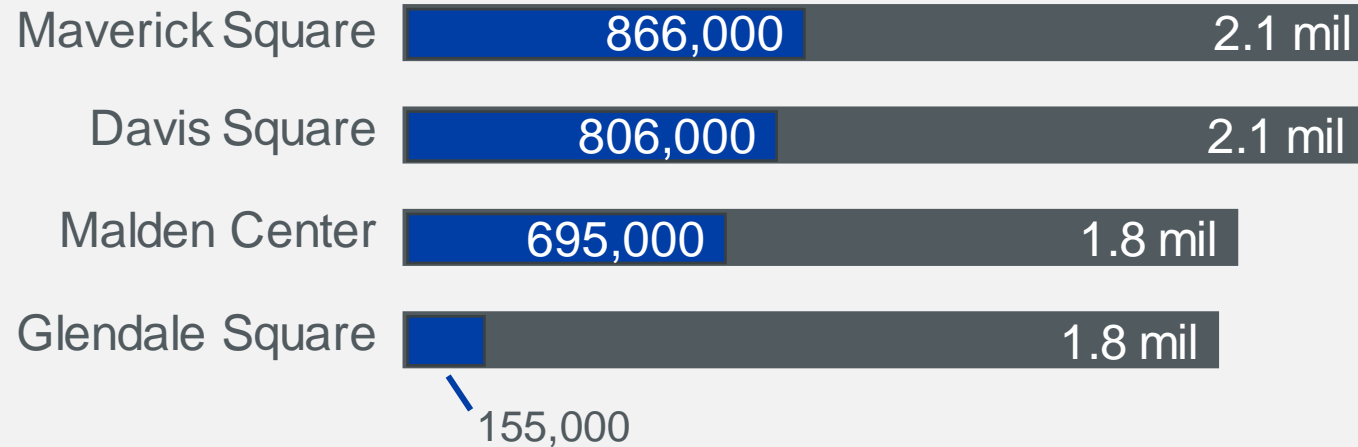
Everett residents can access fewer jobs within 45 minutes by both car and transit



NOTE: Differences in scale

Job Access

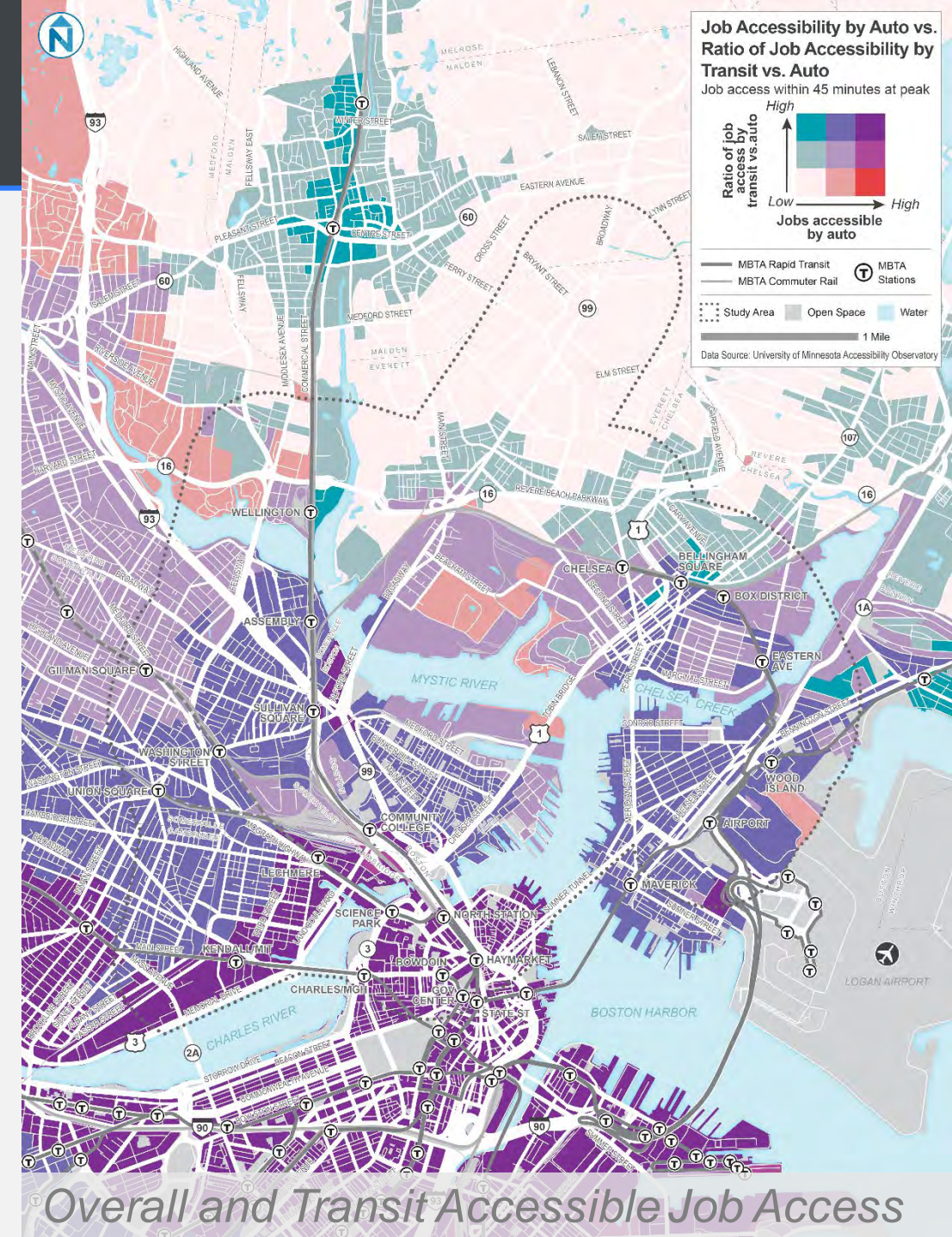
Everett's lack of quality transit access further reduces job accessibility



Jobs accessible within
45 mins via transit

Jobs accessible within
45 mins via auto

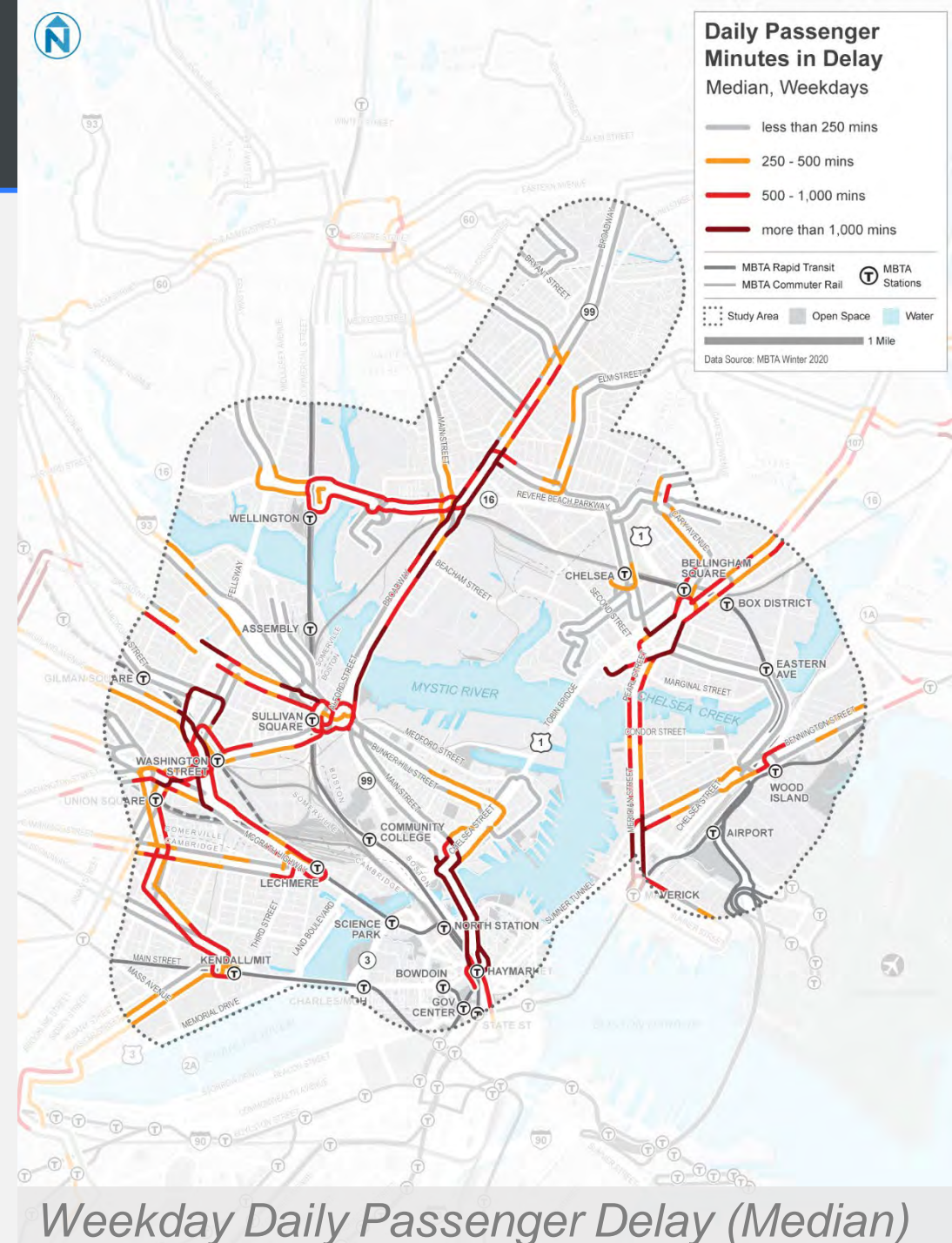
Source: University of Minnesota Accessibility Observatory (2019)



Bus Delays

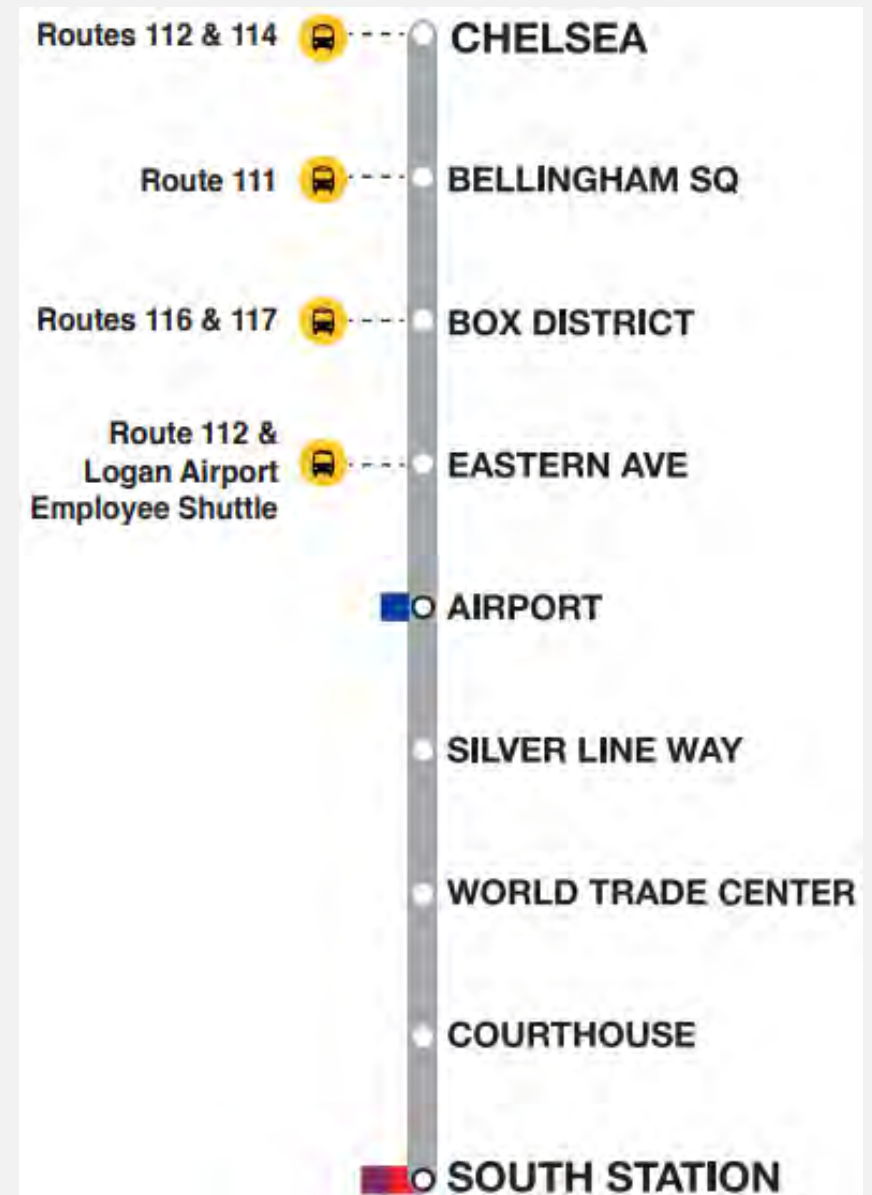
Buses are delayed by congestion on most primary corridors in study area

- Preliminary top delay corridors
 - Broadway/Sweetser Circle
 - Broadway/Bellingham Square
 - McGrath Highway (near Washington Street)
 - North Washington Street
- Planned or recently implemented transit priority on many of these corridors
 - Benefits not fully captured in Winter 2020 data



Silver Line 3

- Began operations in spring 2018 between South Station and Chelsea
- Operates in the transit tunnel between South Station and Silver Line way
- From Silver Line way to north of the Eastern Avenue Station it operates in mixed traffic
- North of Eastern Avenue Station, the SL3 operates in an exclusive busway
- Travel times (average, not including bridge lifts) are:
 - Chelsea to Airport = 8 minutes
 - Chelsea to South Station = 35 minutes



Silver Line 3

- Operations begin at
 - Weekdays 5:00AM – 1:00AM
 - Saturdays 5:30AM – 1:00AM
 - Sundays 6:30AM – 1:00AM
- Rely on a fleet of 60' articulated diesel-electric buses
- Seated capacity of 47 passengers



Silver Line 3

- Major constraints with the SL3 include:
 - **Chelsea Street Bridge** – a vertical-lift bridge that can cause delays of up to 30 minutes for the SL3
 - **Ted Williams Tunnel Congestion** – SL buses use general purpose lanes through the Ted Williams Tunnel and experience heavy traffic congestion on a regular basis
 - **Seaport Circulation** – SL3 buses operates on a circuitous route in the Seaport with frequent crossings that add to route delays
 - **D Street Intersection** – at D Street, buses wait at a signal to transition from the transit tunnel



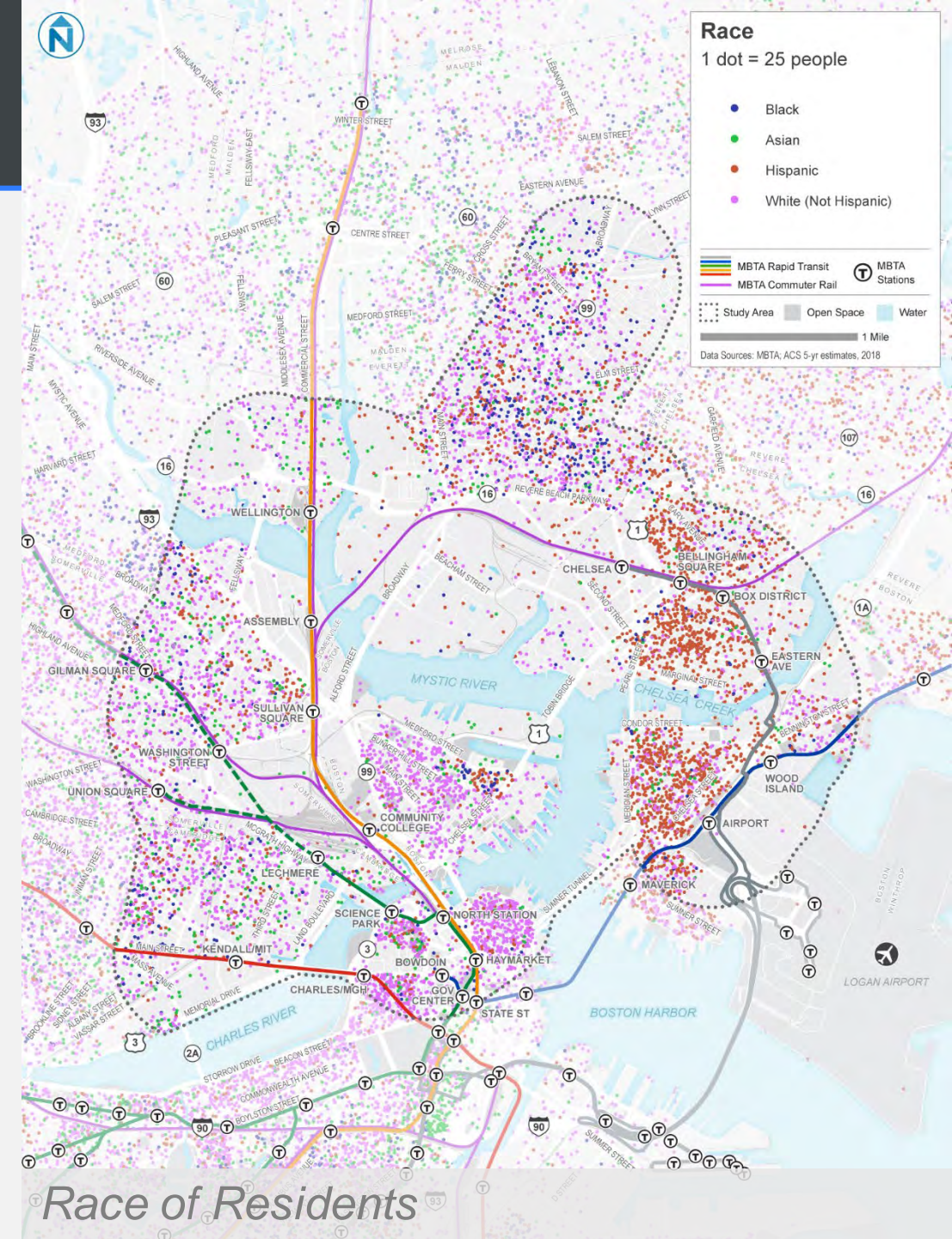
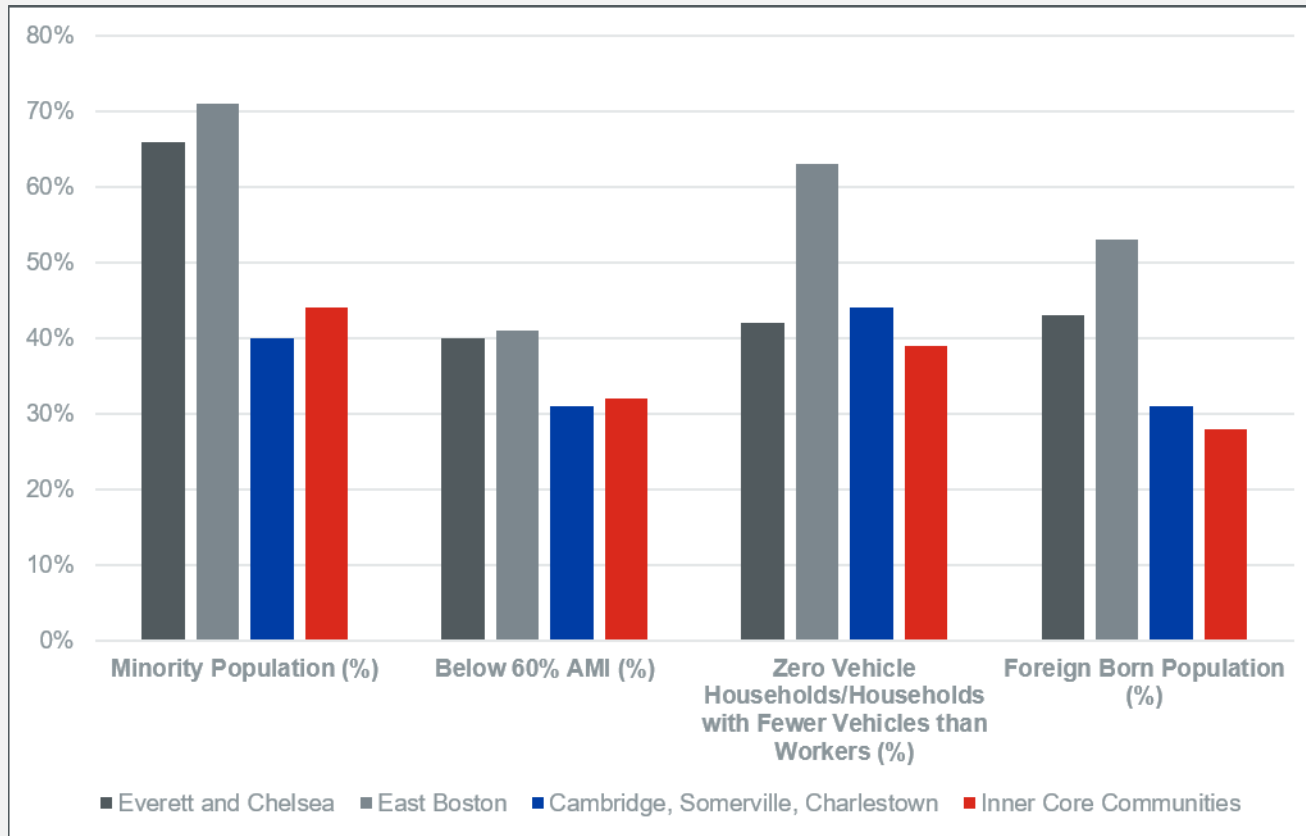
Advance Equity

Addressing Need and Providing Opportunity
to Transit Critical Populations



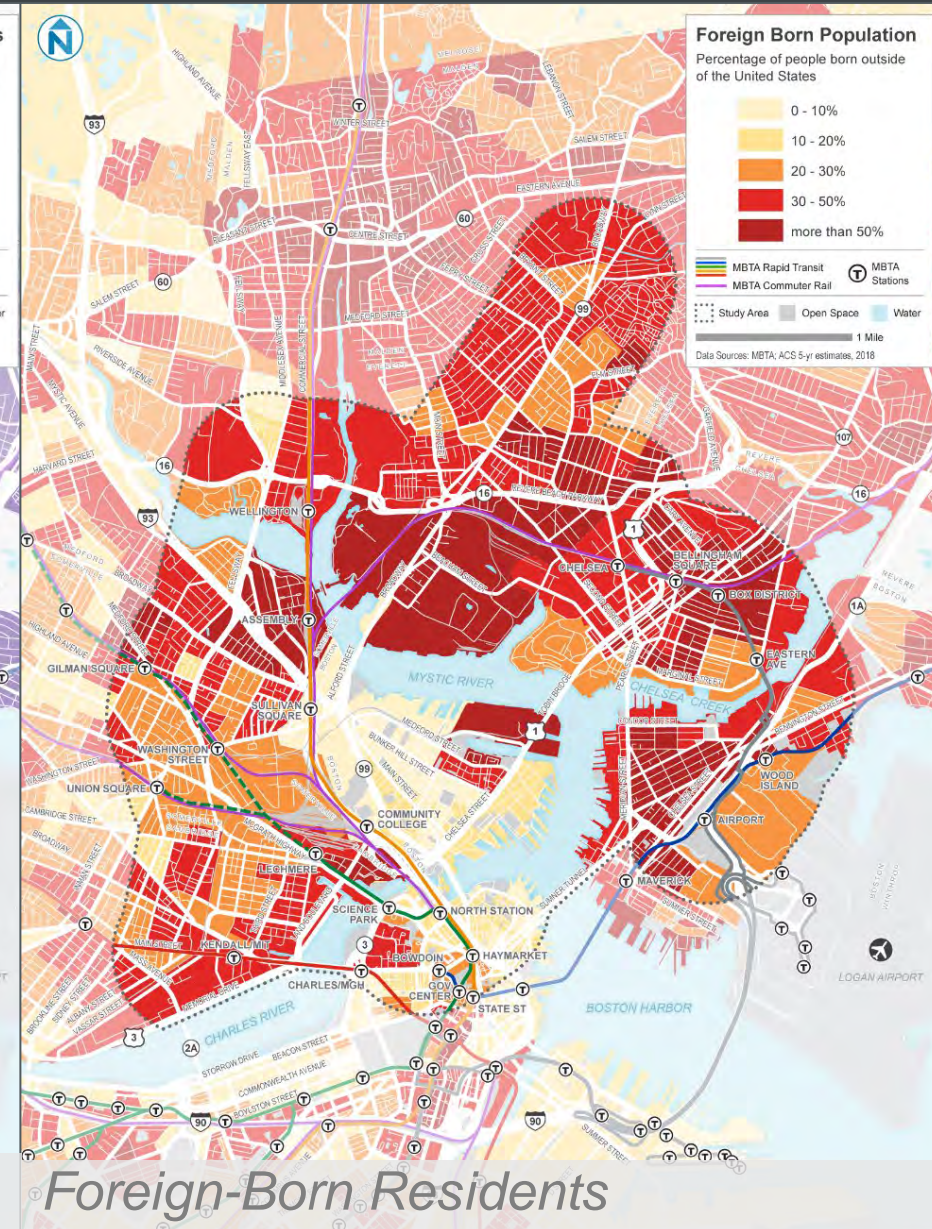
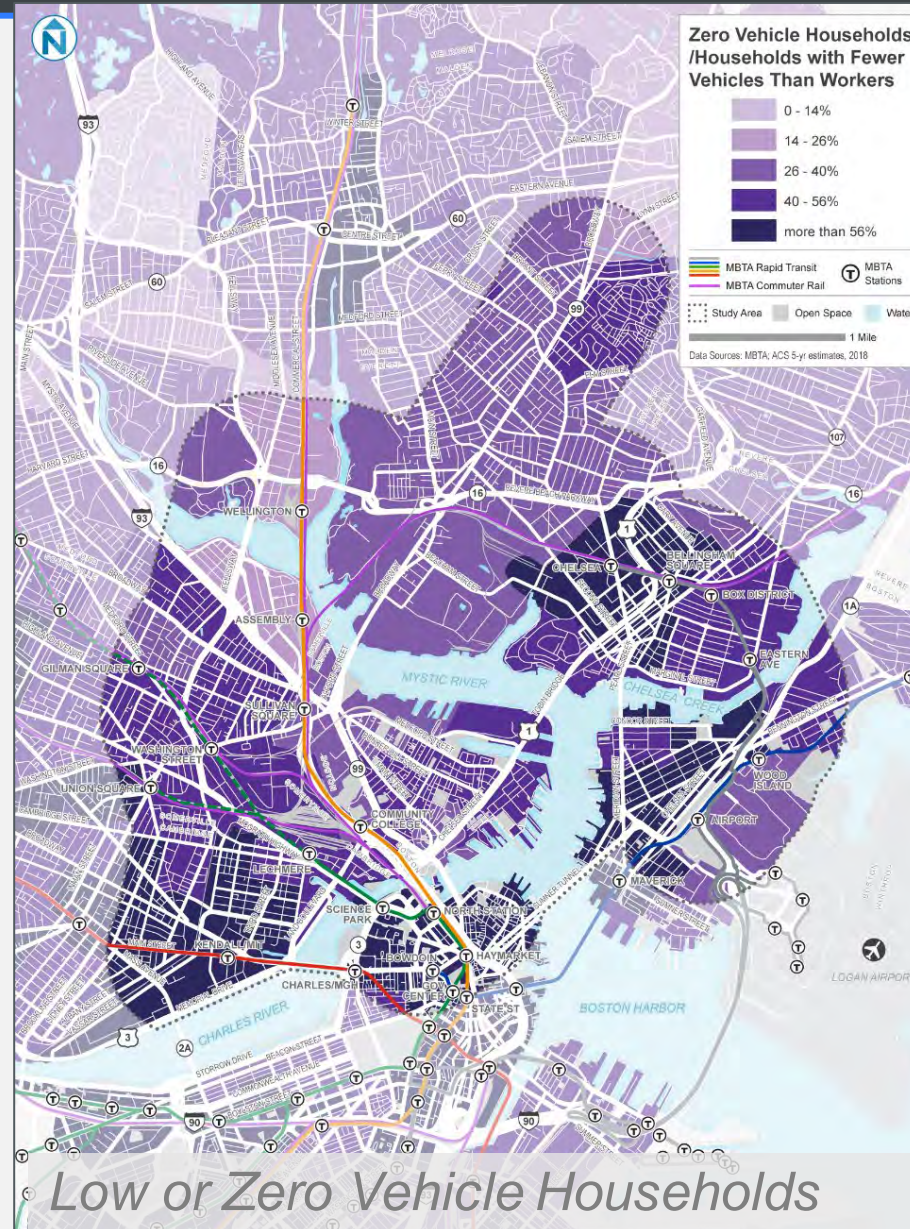
Demographics

Study area has more “transit critical” residents than the Inner Core overall, but with significant community variation



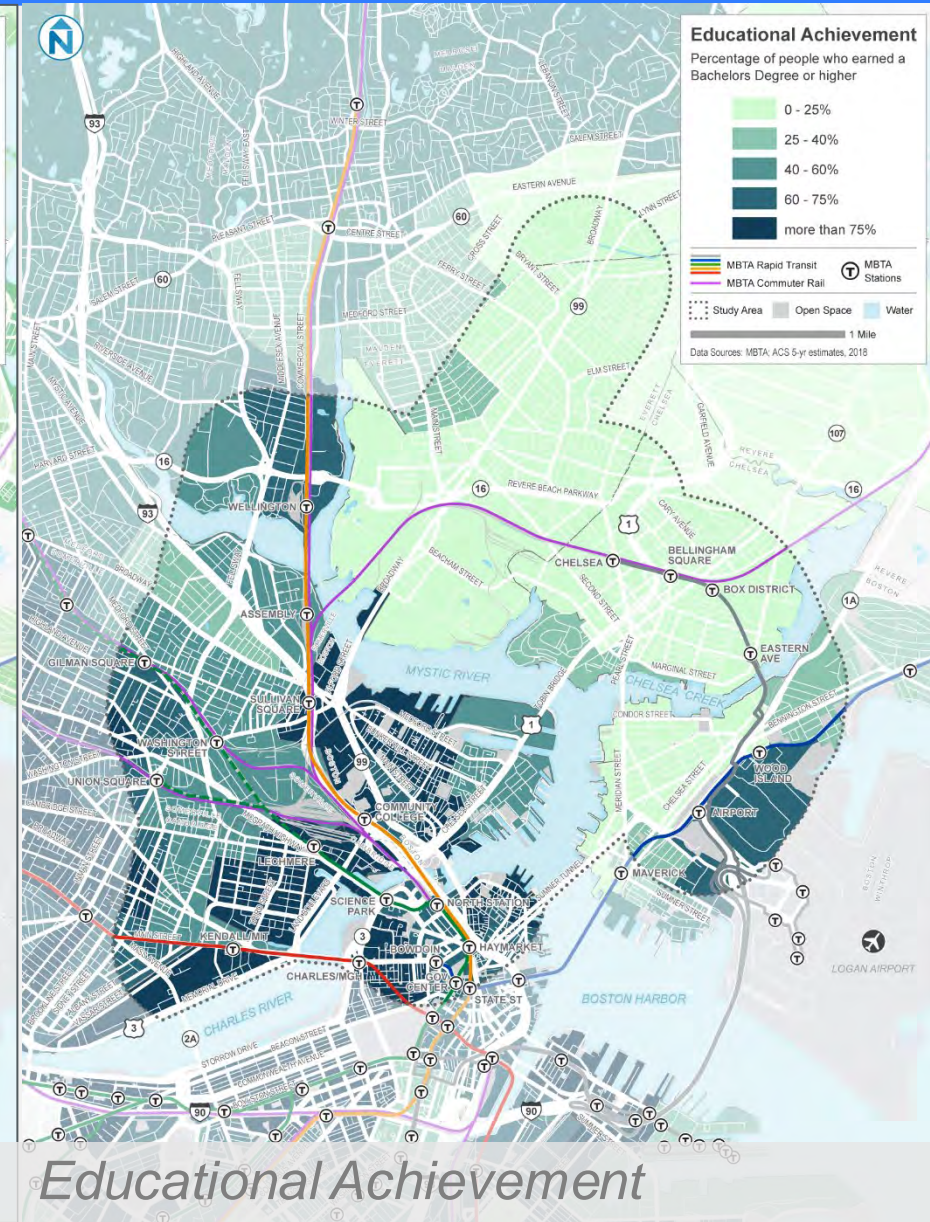
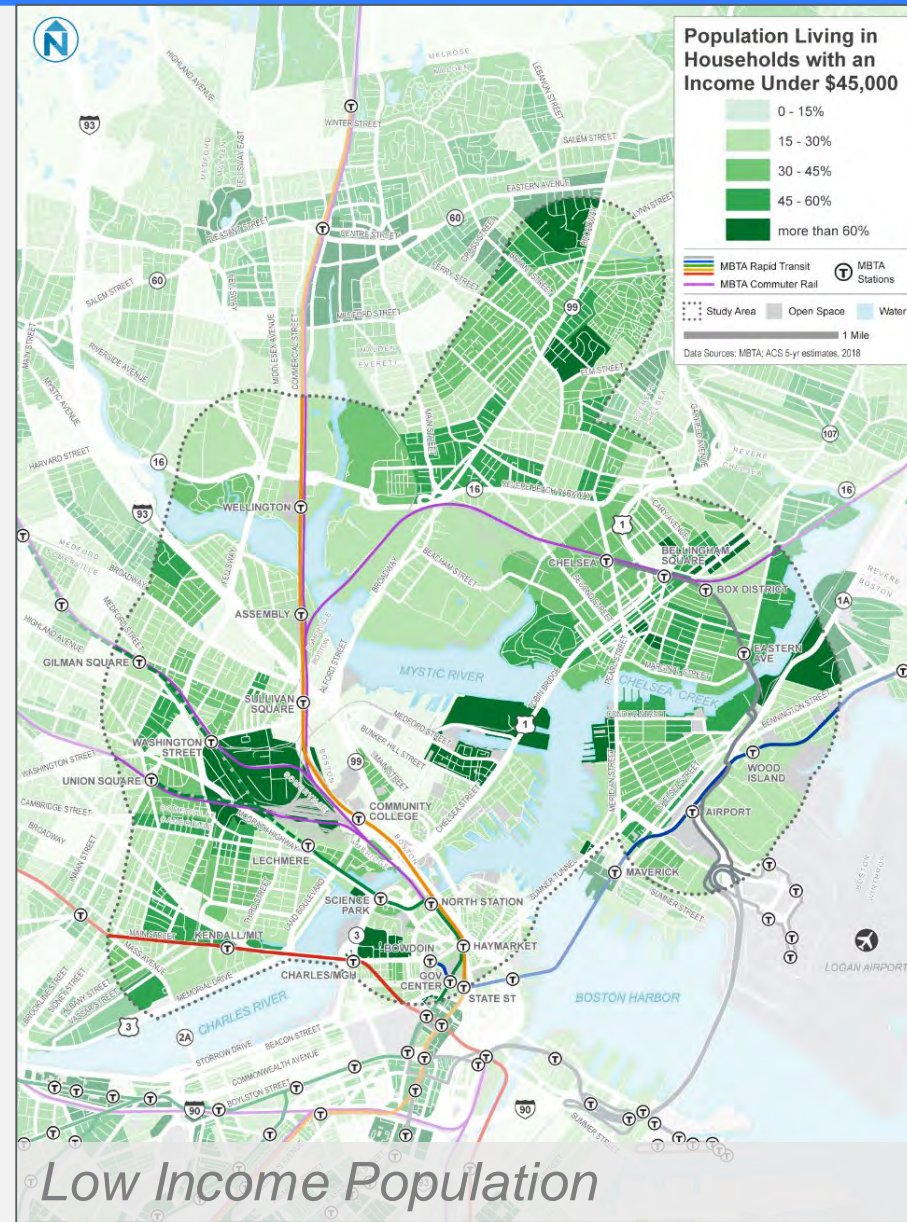
Demographics

The study area shows very high levels of households where the percentage of people born outside the U.S. is higher than 50%, and where households have fewer vehicles at home than workers



Demographics

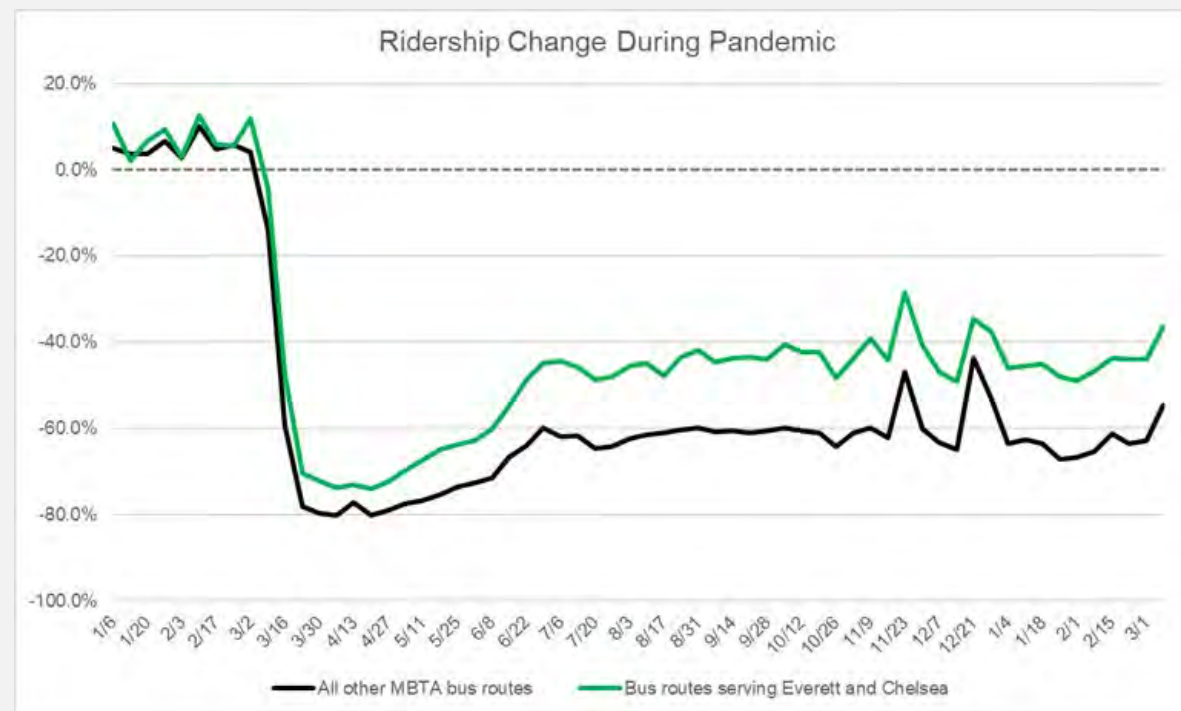
There are several concentrations where over 60% of households hold incomes under \$45,000/year and where less than a quarter of households have a bachelors degree or higher



Bus Ridership During Pandemic

Everett and Chelsea have had amongst the fastest ridership recovery in the MBTA network from pandemic lows

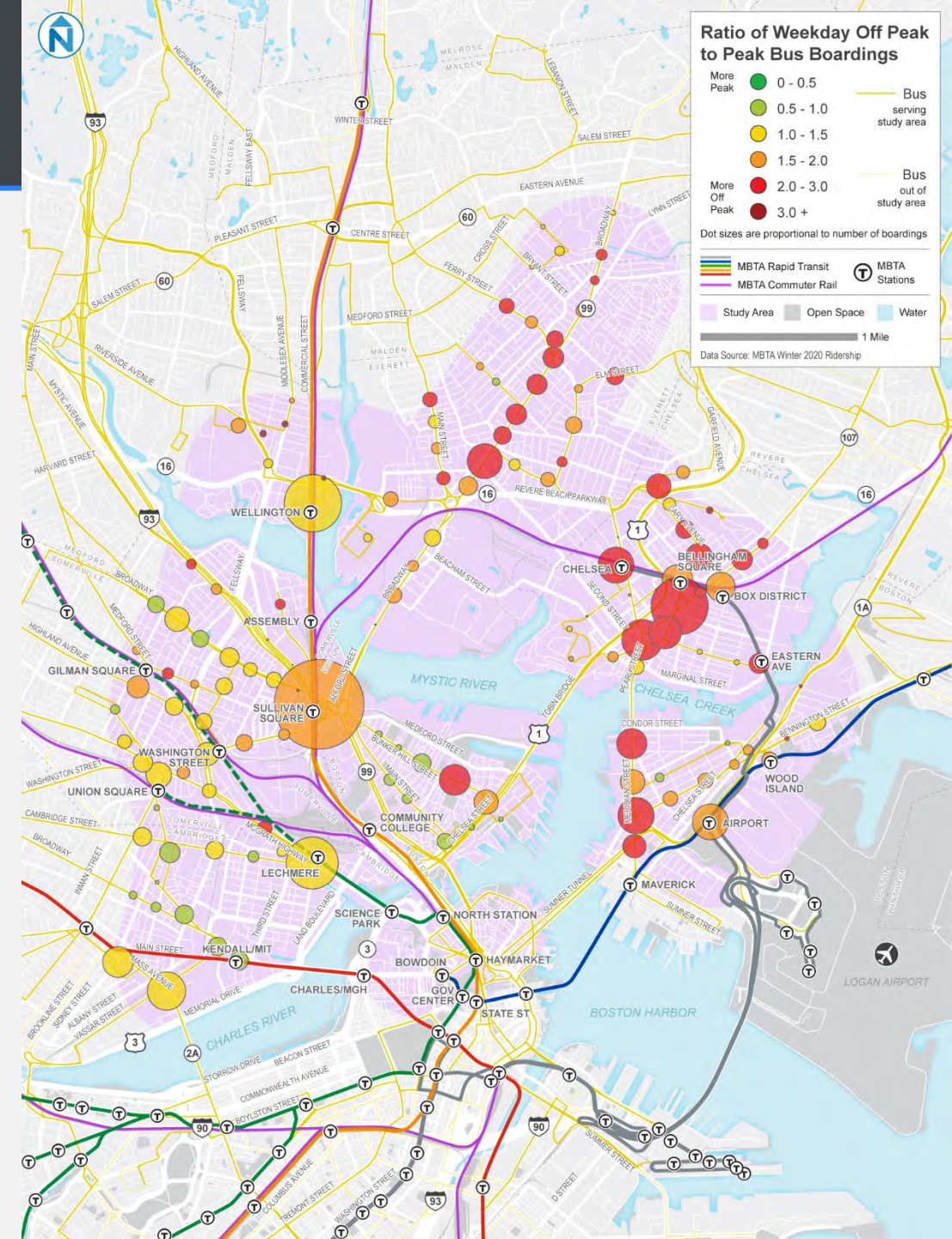
- Six of the top fifteen routes in terms of ridership recovery serve Everett and/or Chelsea
- Systemwide Bus Ridership = 47.2% of early 2020 ridership
- Everett/Chelsea = 63.5% of early 2020 ridership



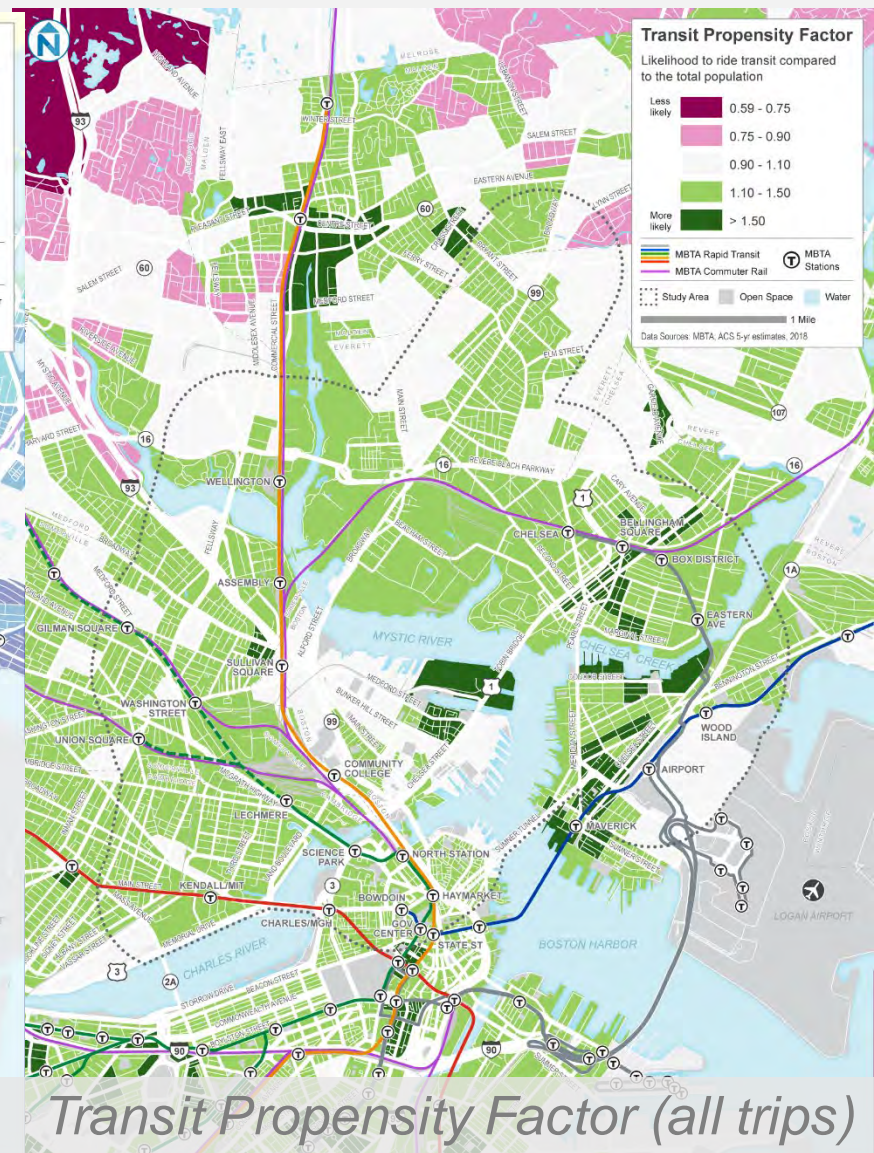
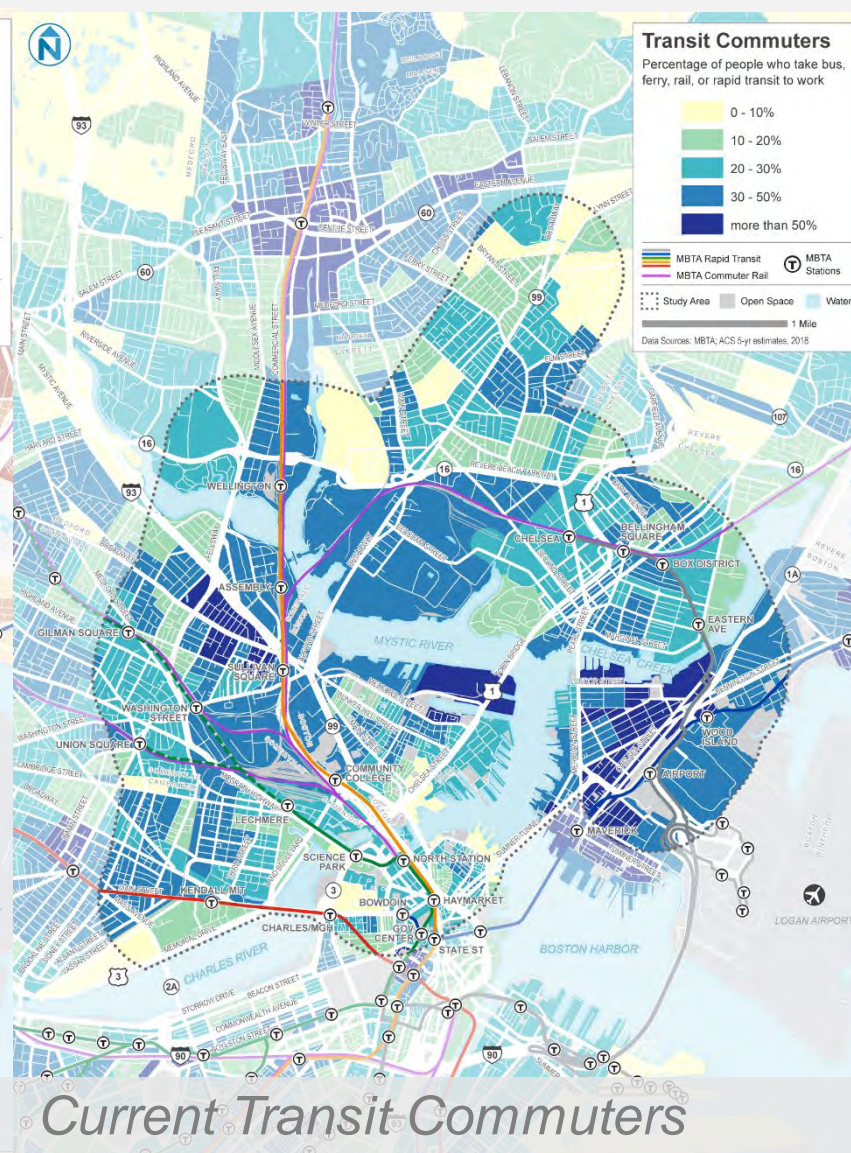
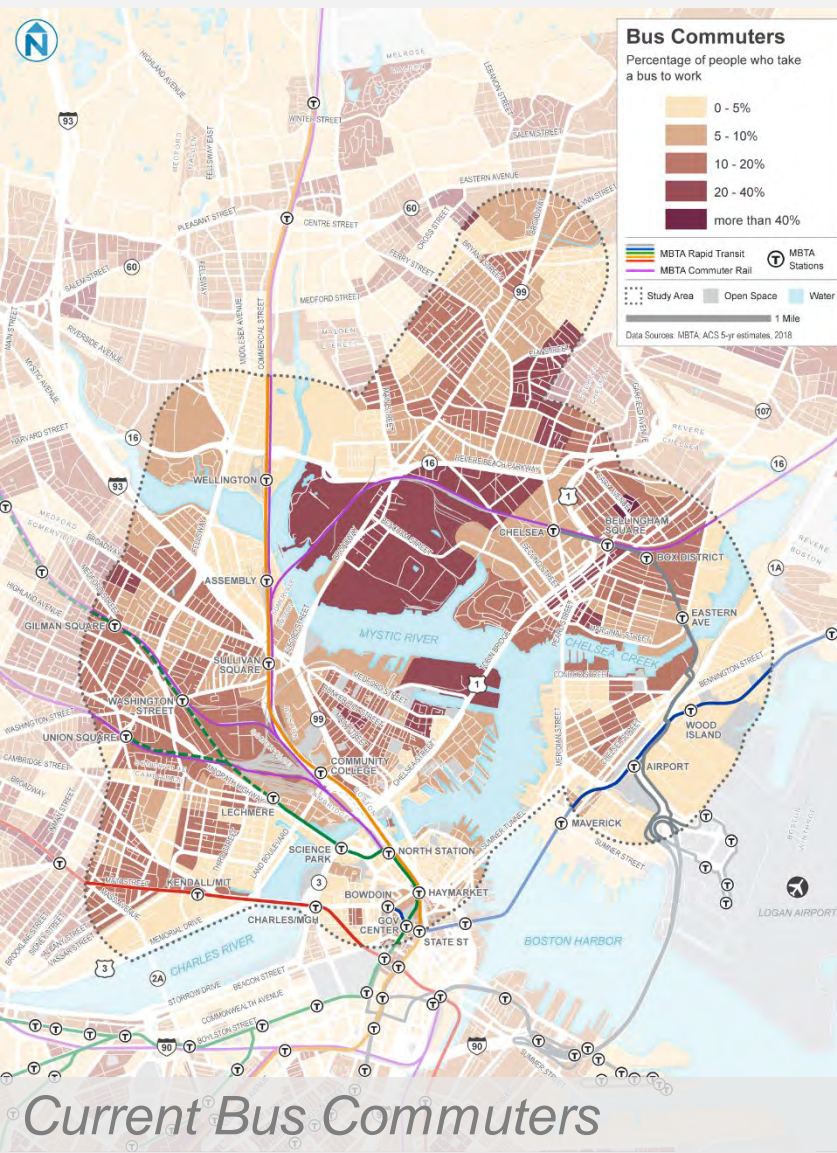
Bus Ridership – Time of Day

Everett and Chelsea bus riders are more likely to travel during off peak periods

- This map shows a ratio of Off Peak to Peak bus boardings
- Anything higher than a 1.0 would show more boardings in the Off Peak
- These are shown in the map as circles (boardings) in yellow, orange, and red



Transit Propensity



Improve Safety

Providing Safe and Comfortable Access,
Addressing Known Safety Issues



Roadway Network

Study area roadways are constrained and congested

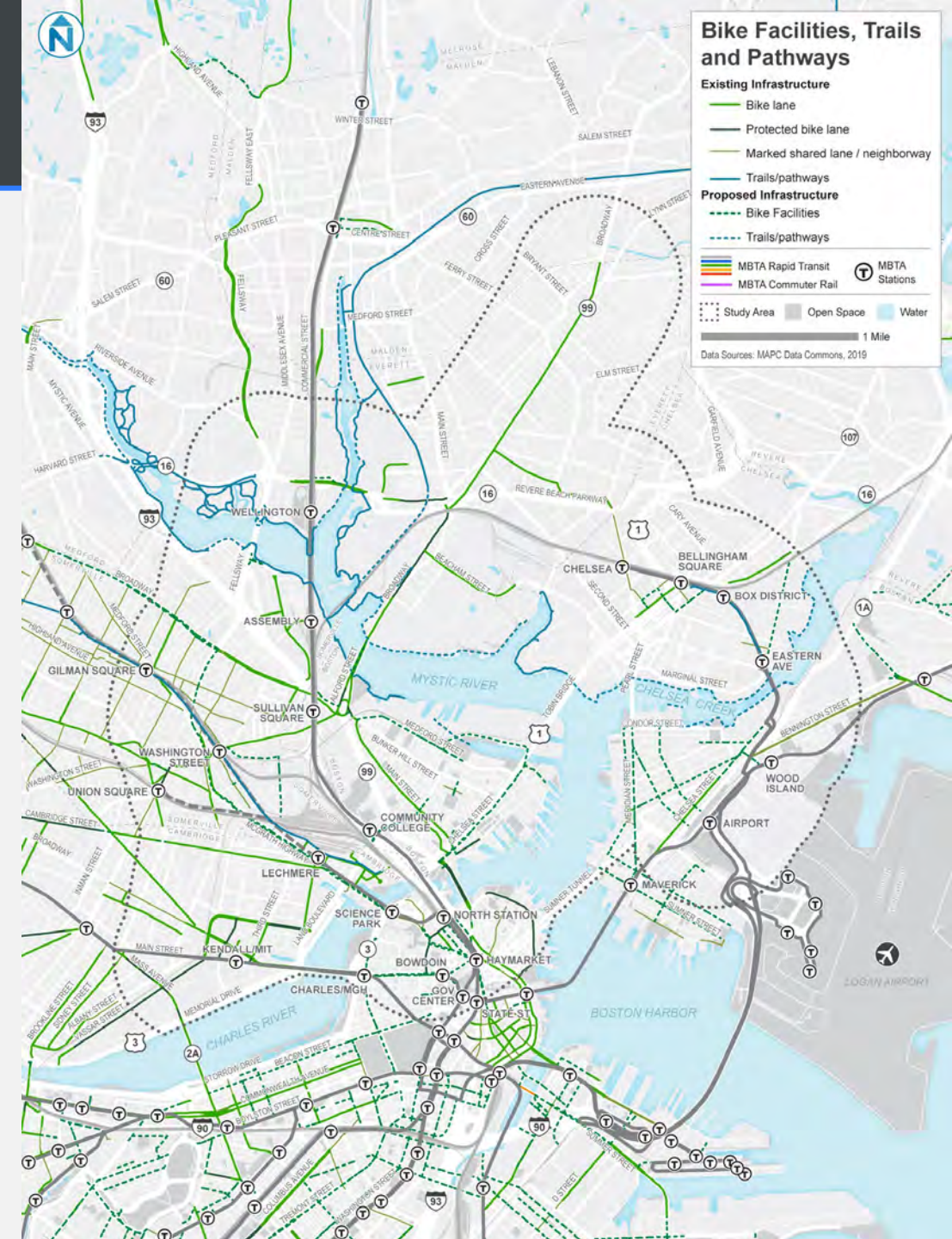
- Most arterials in the study area have two travel lanes, 25-50 feet curb-to-curb
- Several regional roadways are wider, but also have high traffic volumes



Gaps in Bicycle Network

Study area has a growing local and regional bicycle network

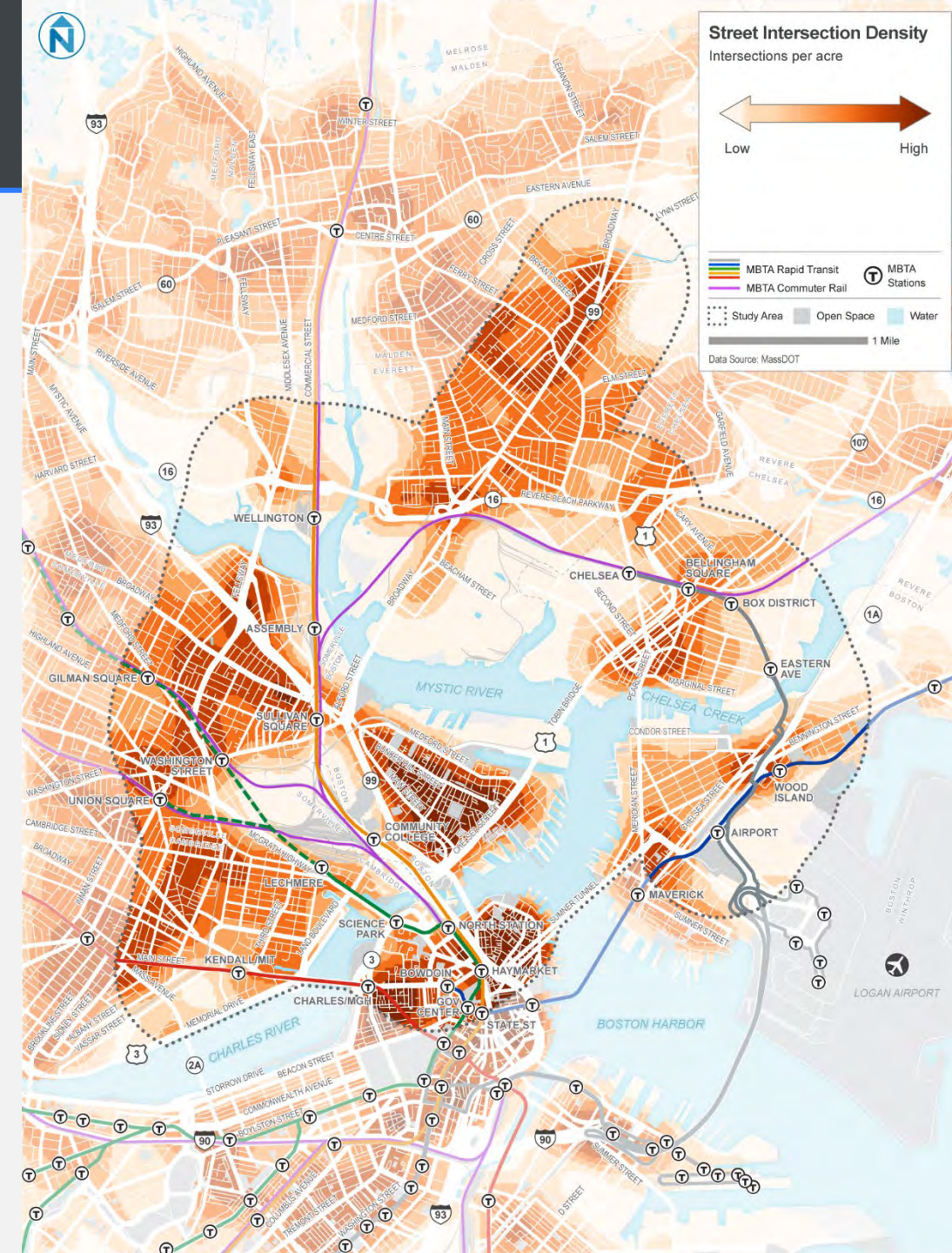
- New bicycle infrastructure on several major arterials in study area
- Major investments in Northern Strand and Community Path
- **Major gaps remain** and most local arterials lack bicycle infrastructure



Pedestrian Network

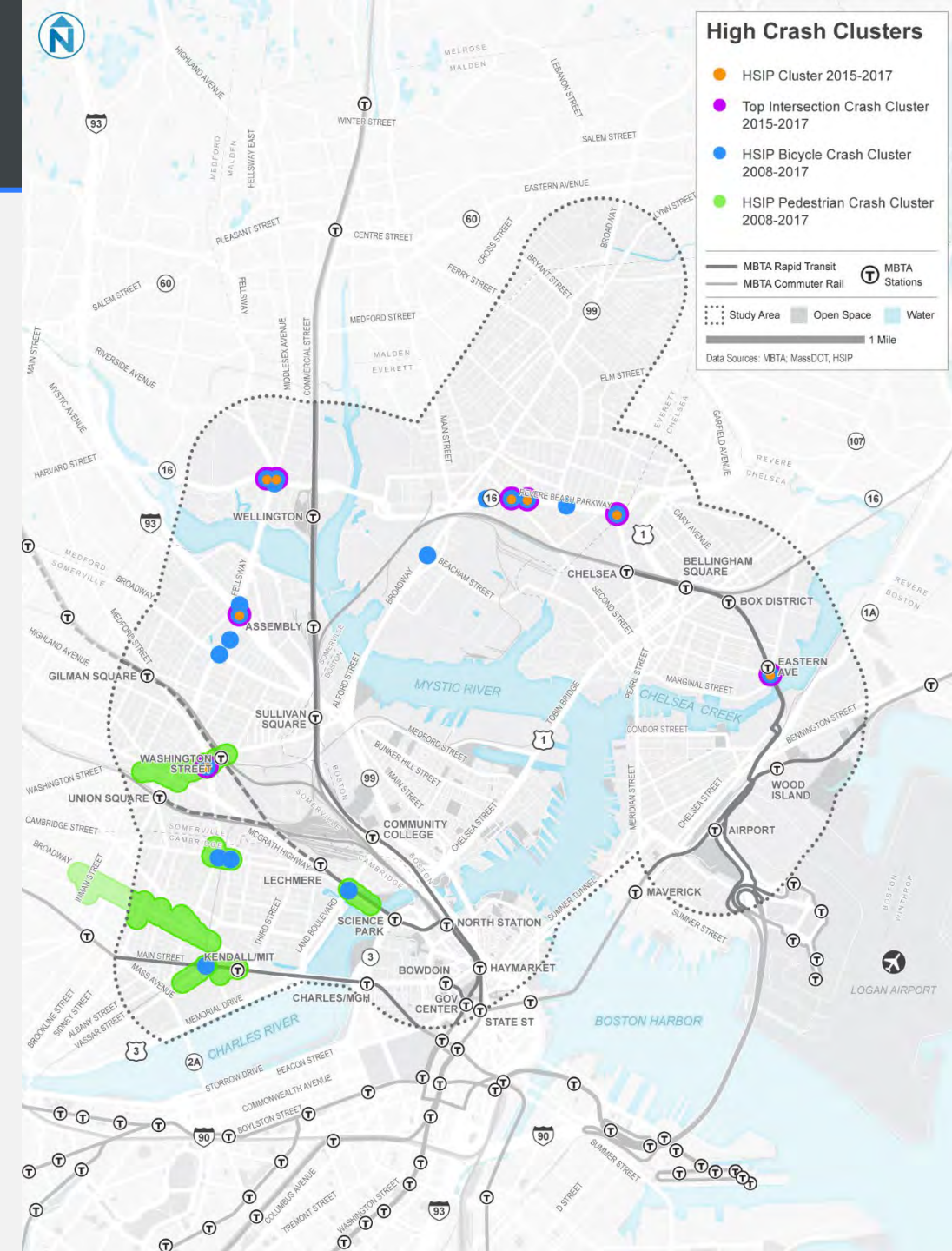
Study area has significant barriers for pedestrians

- Residential neighborhoods have walkable, connected street networks
- Numerous major barriers:
 - Disconnected commercial/industrial districts, like the Commercial Triangle and Inner Belt
 - Major arterials, like Revere Beach Parkway and McGrath Highway
 - Commuter rail right-of-ways



High Crash Locations

- High crash clusters include:
 - Along Route 16
 - Wellington area
 - Assembly Area
- Additional bike crash clusters
 - Route 28
 - Lower Broadway
 - Kendall area
 - Charles River Dam Road
- Additional pedestrian crash clusters
 - Washington Street corridor
 - Kendall area
 - Charles River Dam Road



Support Climate Change Resilience and Sustainability

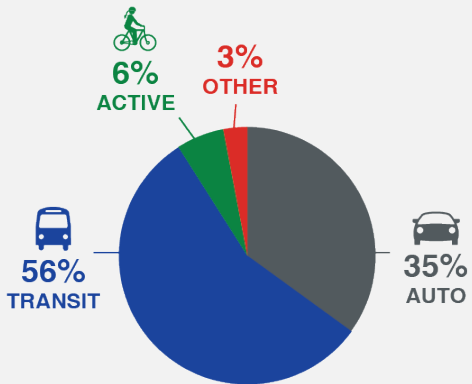
Addressing Climate Change Vulnerabilities



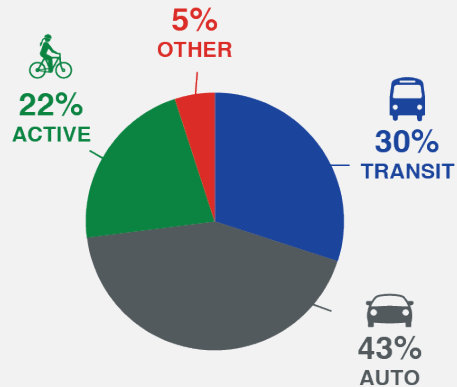
Transit Commute Mode Share

More people in Everett and Chelsea commute by car

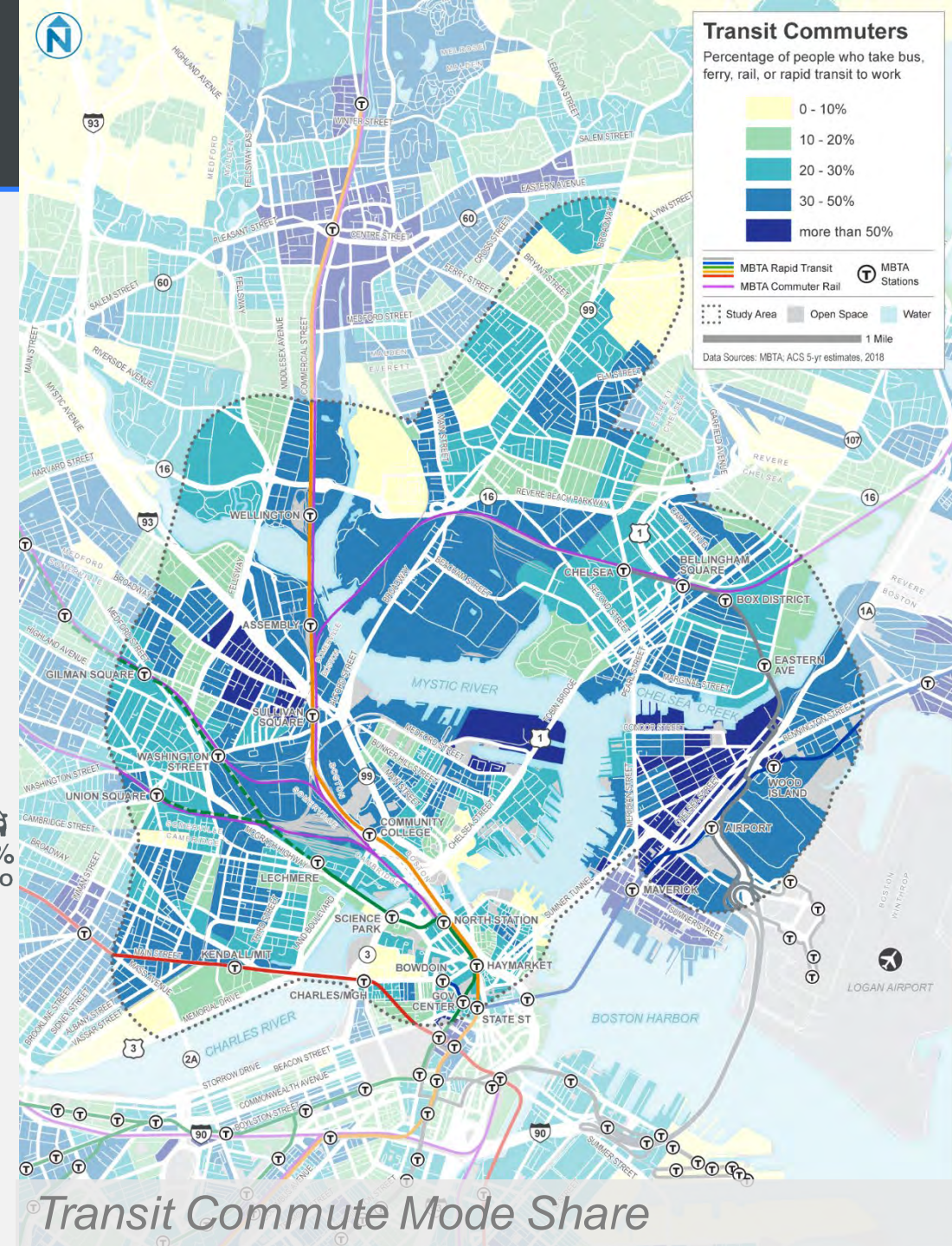
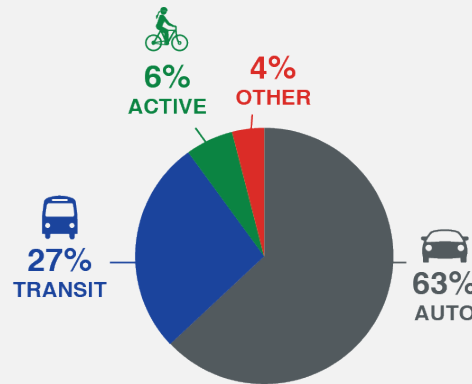
East Boston



Charlestown/Cambridge/Somerville



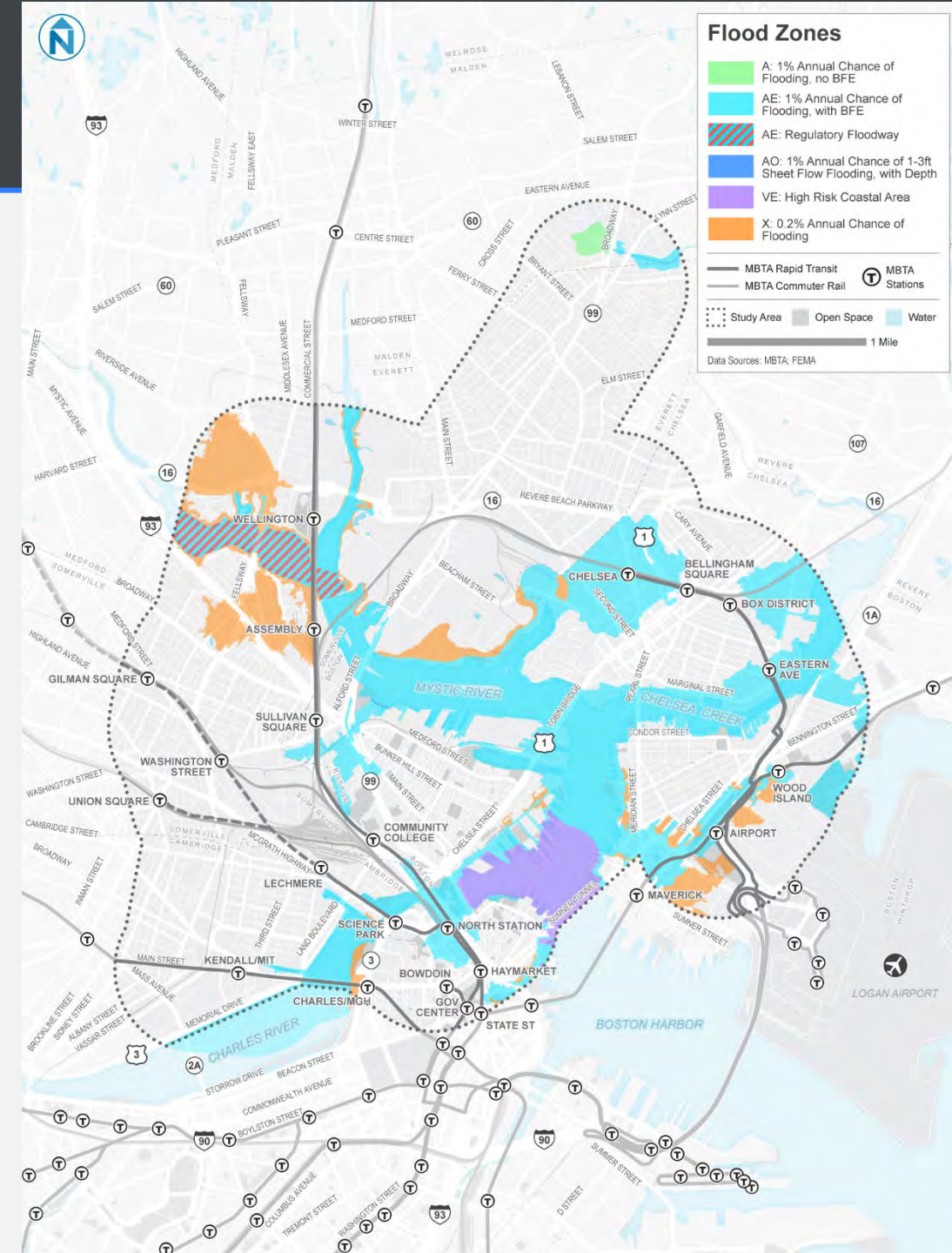
Chelsea/Everett



Flood Zones

Greatest environmental risk in study area comes from flooding

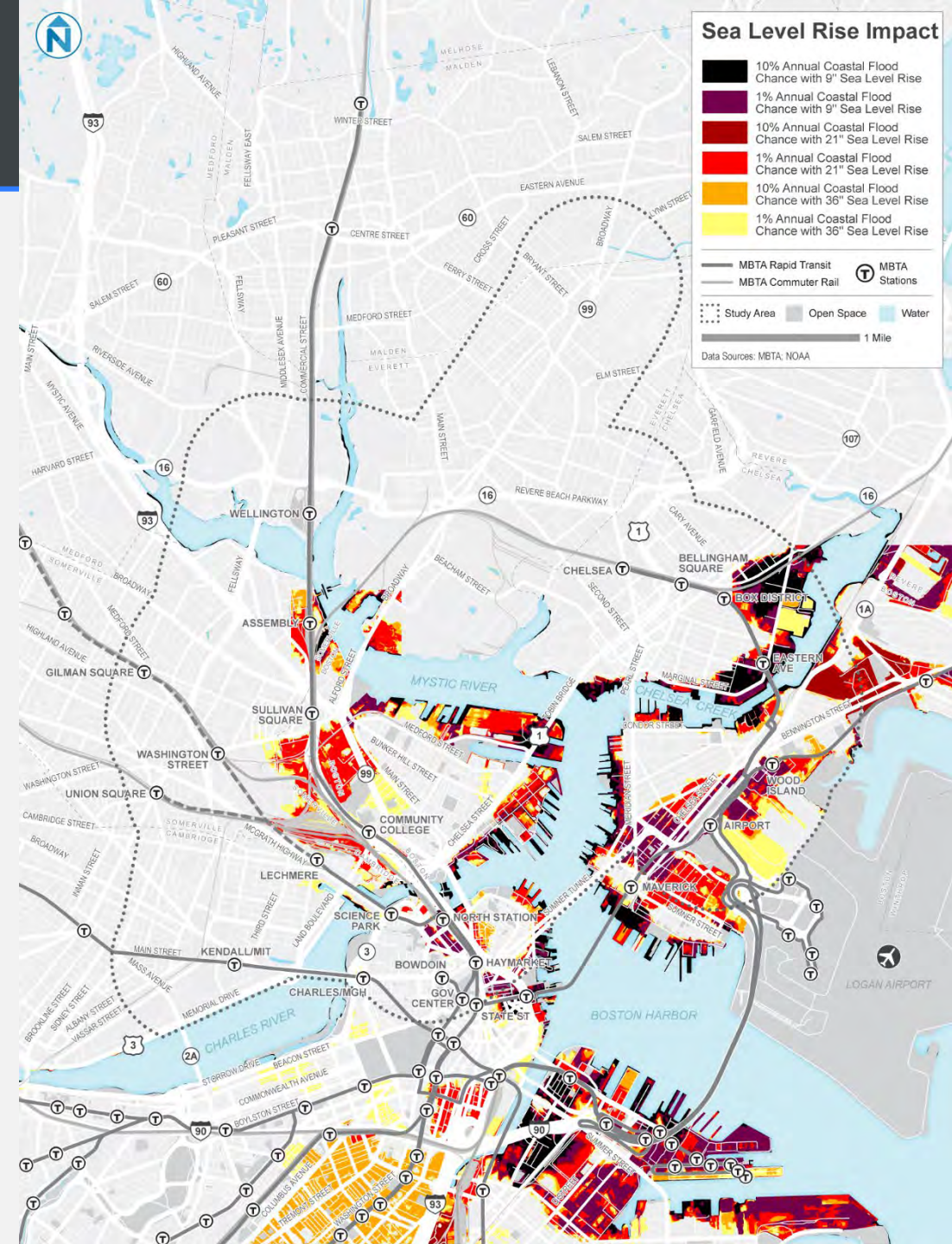
- Portions of Everett and Boston lie within 100-year flood zones
- Sections within Medford and Somerville lie within 500-year flood zones
- Drainage issue near MBTA Newburyport commuter rail line causes localized flooding in storm events



Sea Level Rise

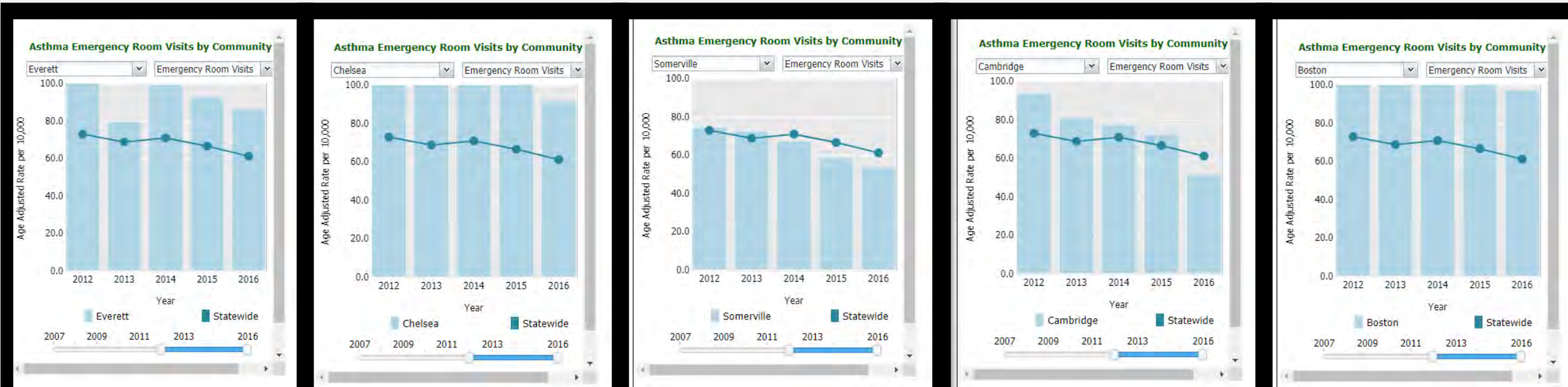
Sea level rise could pose a risk of increased future flooding near potential extension alignments

- Sections of the study area pose some risk of sea level rise impact
 - Assembly vicinity
 - Lower Broadway vicinity
 - Sullivan Square vicinity



Climate Change and Sustainability

Much of the study area – Everett, Chelsea, and Boston in particular – sees far higher rates of asthma hospitalizations than the statewide average. Asthma hospitalizations can be triggered by environmental pollutants including air pollution



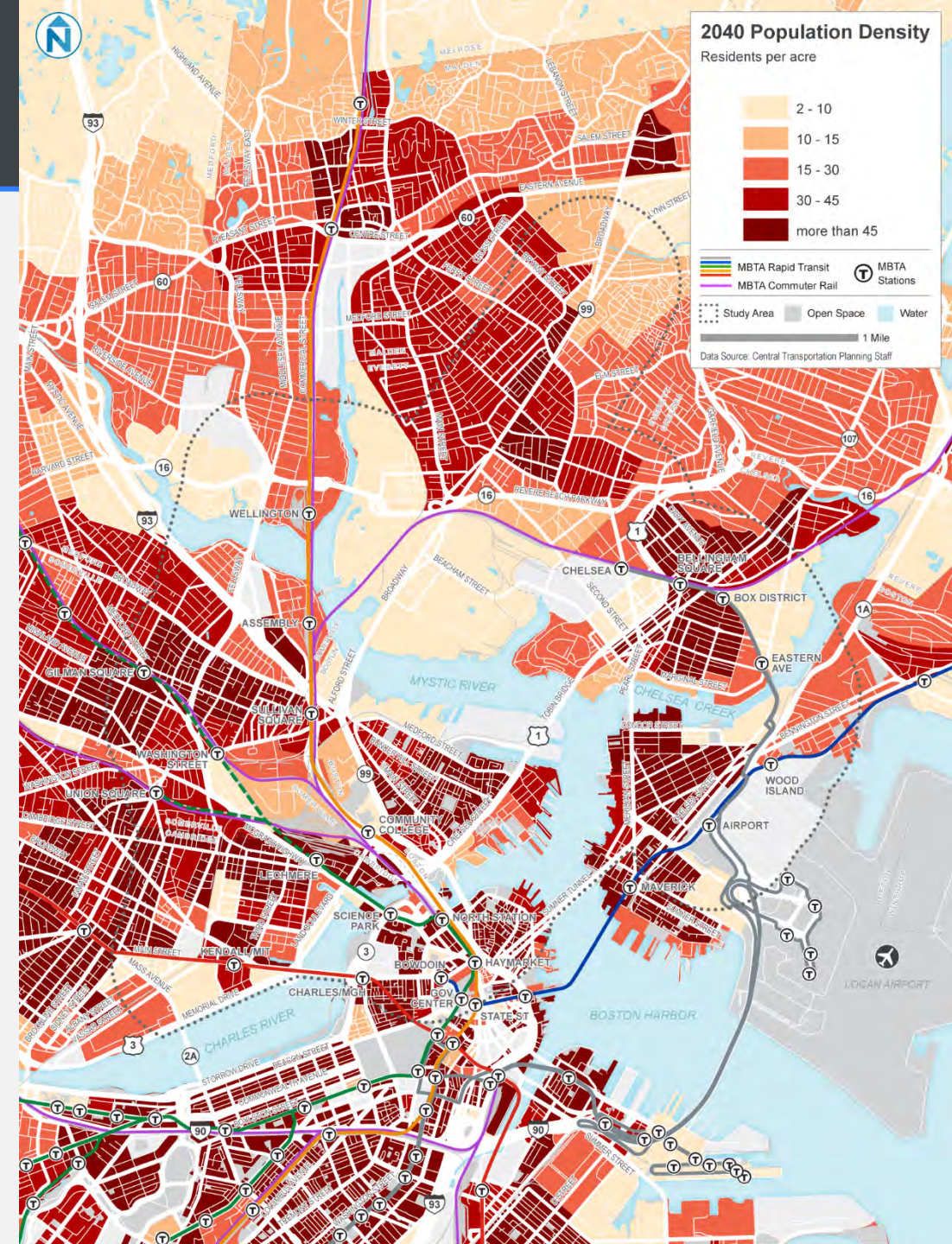
Future Conditions

How Changes in our Study Area Might Change
Conditions from What Exist Today

Future Conditions

Anticipated Population Density (2040)

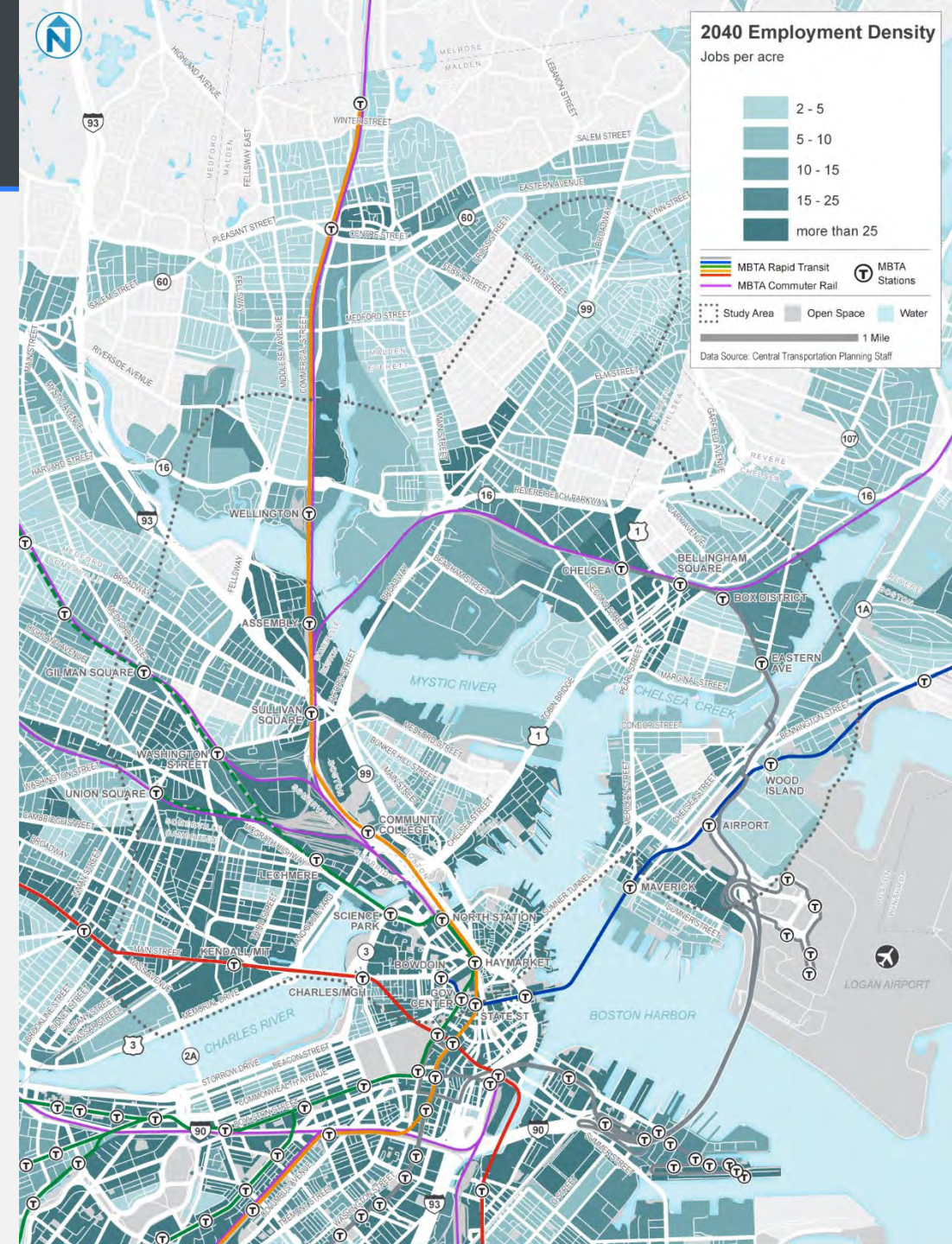
- Future population numbers look at
 - Land use patterns
 - Development
 - Zoning
- Population density anticipated to be very high within core parts of the study area
- Augmenting these numbers with what is known from development pipeline



Future Conditions

Anticipated Employment Density (2040)

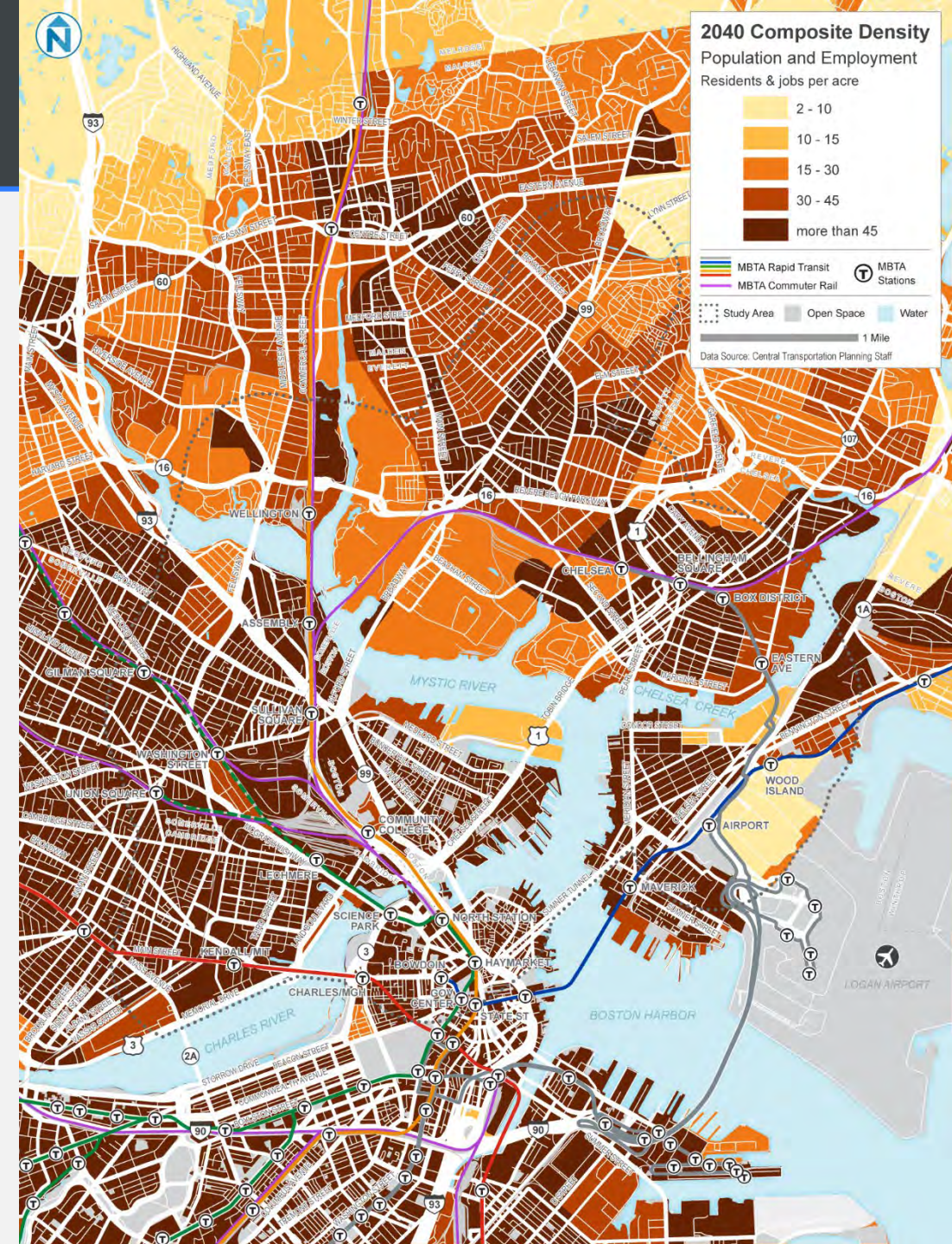
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Future Conditions

Anticipated Composite Density (2040)

- Composite density considers both population and employment
- Composite density is a measure of how much activity happens within a given area
- Levels are very high throughout our study area



WORKING GROUP DISCUSSION

1. What do you find most compelling from this analysis?
2. Are you surprised by any of these findings?
3. In your opinion, is there anything that we should have looked at, but is missing?

Potential Alignments to be Considered

A draft set of the long list of ideas

Our Proposed Evaluation Process



Review a wide host of ideas and remove all those that don't meet the project's purpose

We Are Here

Section A



Section B



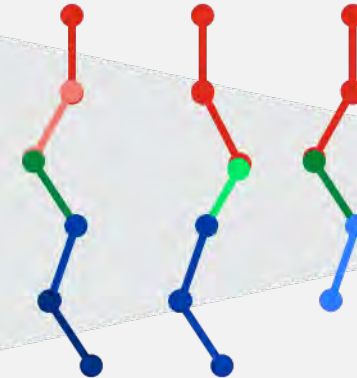
Section C



Test different alignments within each section

NOTE: Alignments shown above are illustrative, and not intended to represent any specific alignments!

Entire Route



Test best alignments as complete route

LPA

Potential Alignments

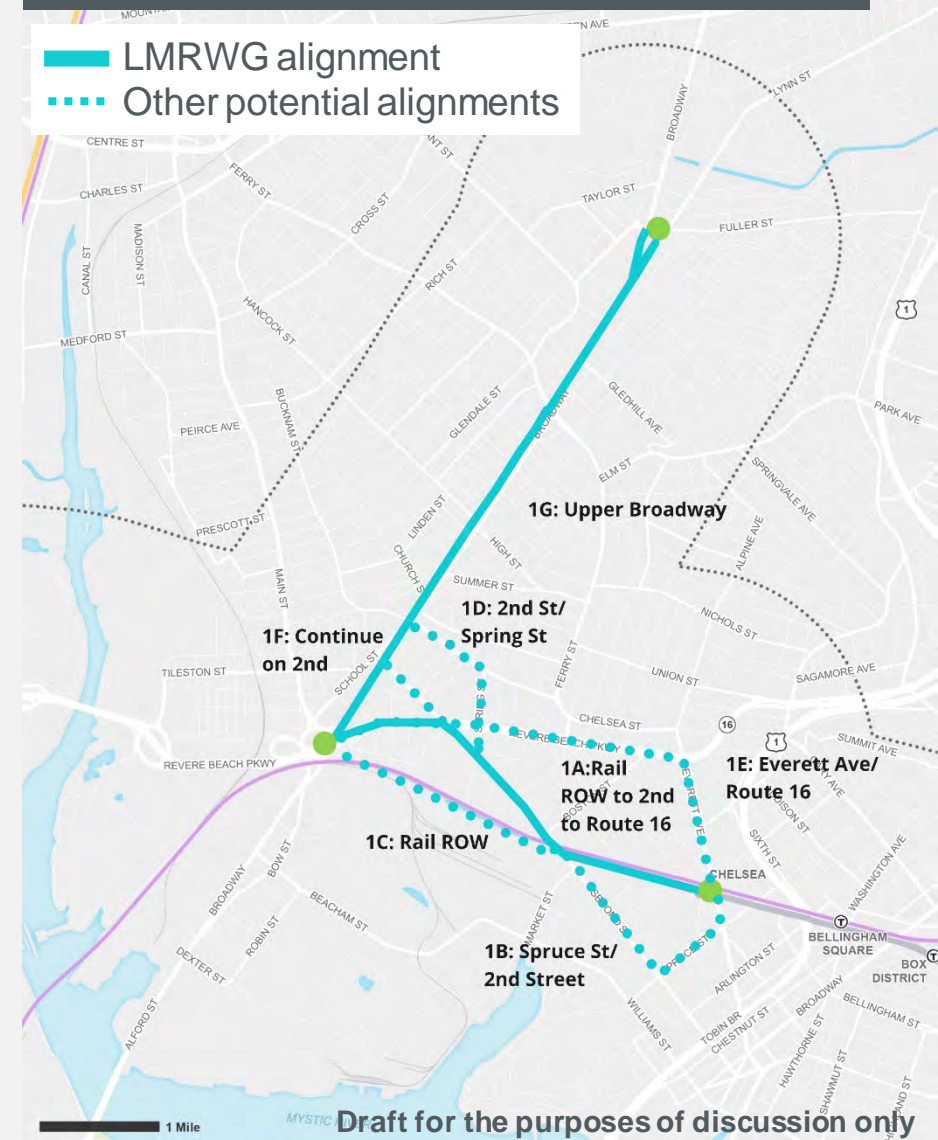
- Study team identified a universe of potential alignments based on the existing conditions analysis, stakeholder discussions, and past studies
- Alignments will be refined in collaboration with stakeholders and the public
- Not all alignments shown today will pass through the “Screening” process
- Alignment segments may be combined in different ways as we determine what Alternatives should advance and ultimately select the final Locally Preferred Alternative

Potential Alignments: Section 1

Code	Name	Description
1A	Rail ROW to 2 nd to Route 16	Chelsea Station – Rail ROW – 2 nd Street – Route 16 – Sweetser Circle Preferred Alignment from Lower Mystic Study
1B	Spruce Street / 2 nd Street	Chelsea Station – Everett Avenue – Spruce Street
1C	Rail Right of Way	Rail ROW – Sweetser Circle
1D	2 nd Street / Spring Street Option	Spring Street – Chelsea Street – Broadway – Sweetser Circle
1E	Everett Avenue / Route 16	Chelsea Station – Everett Avenue – Route 16 – Sweetser Circle NOTE: Route 16 Study Forthcoming
1F	Continue on 2 nd Option	Chelsea Station – Rail ROW – 2 nd Street – Broadway – Sweetser Circle
1G	Upper Broadway	Glendale Square – Broadway – Sweetser Circle

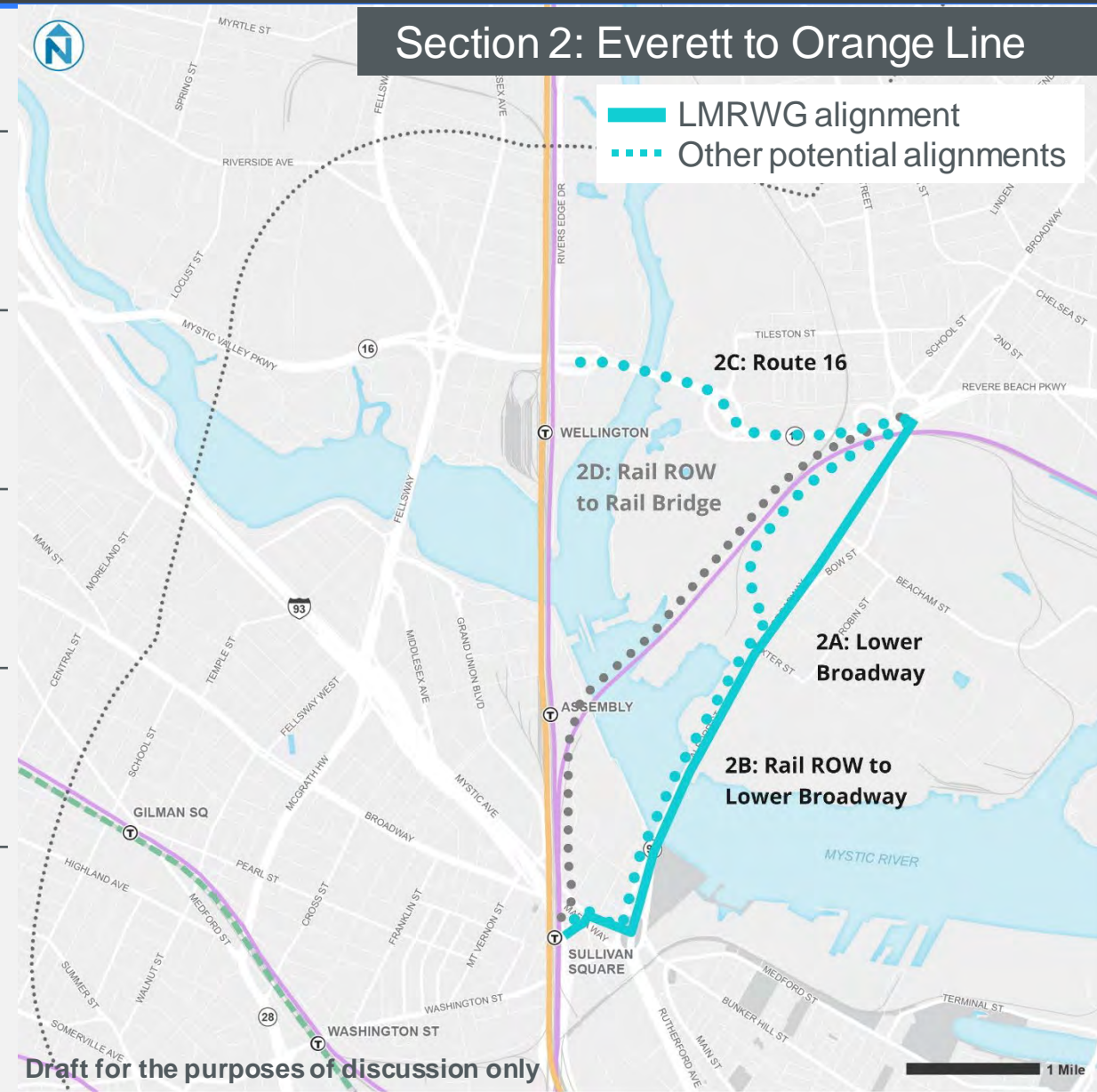
NOTE: The City of Everett is leading a study at Sweetser Circle currently Underway

Section 1: Chelsea to Everett



Potential Alignments: Section 2

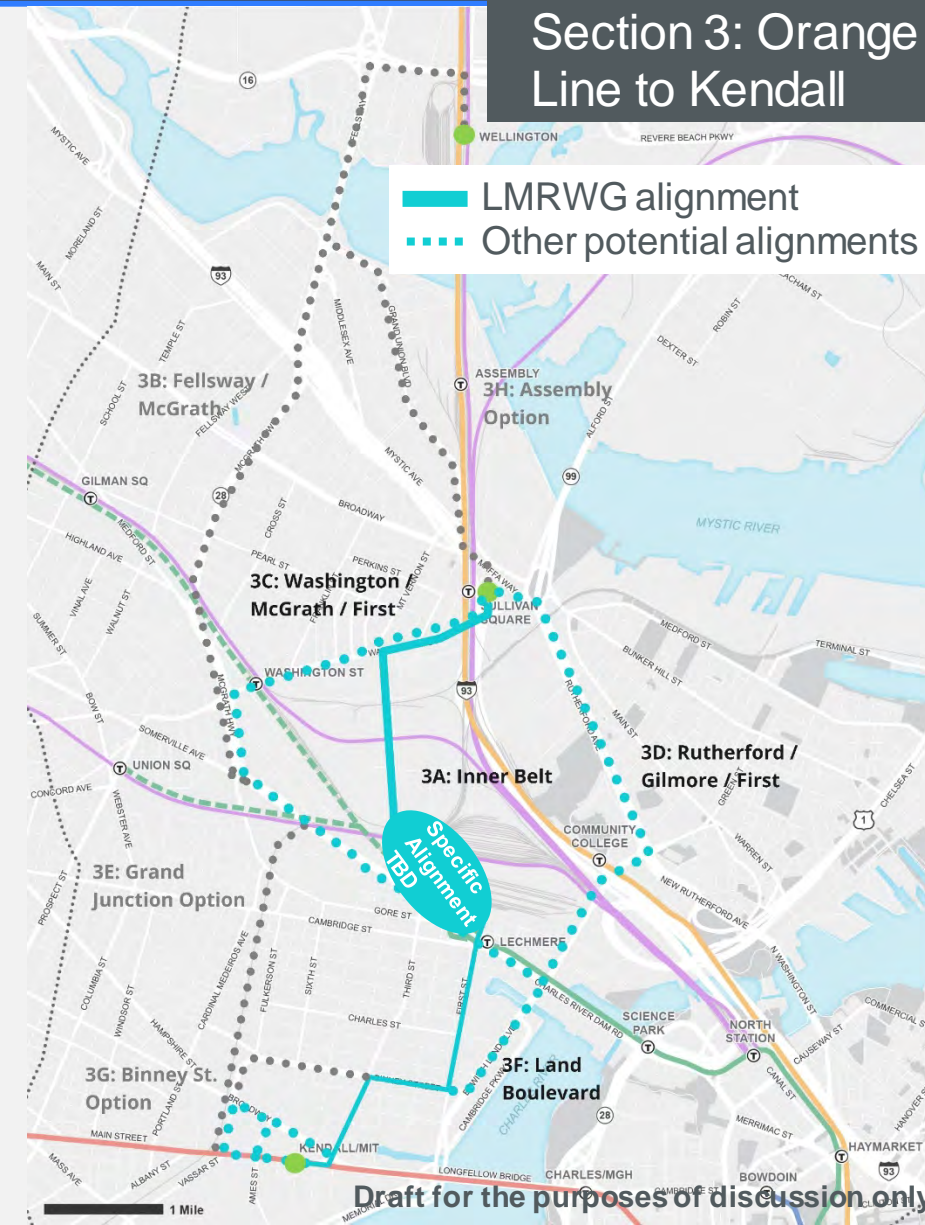
Code	Name	Description
2A	Lower Broadway	Sweetser Circle – Lower Broadway – Sullivan Square Preferred Alignment from Lower Mystic Study
2B	Rail Right of Way to Lower Broadway	Sweetser Circle – Rail ROW – Lower Broadway – Sullivan Square
2C	Route 16	Sweetser Circle – Revere Beach Parkway – Wellington
2D	Rail ROW to Rail Bridge	Rail ROW – New Bridge – New Alignment – Sullivan Square NOTE: Concerns about feasibility



Potential Alignments: Section 3

Code	Name	Description
3A	Inner Belt	<p>Sullivan Square – Washington – Inner Belt Road – McGrath – Lechmere – First Street – Binney Street – Third Street – Kendall Square</p> <p>Preferred Alignment from Lower Mystic Study</p> <p>NOTE: Concerns about feasibility</p>
3B	Fellsway / McGrath	<p>Wellington – Fellsway – McGrath – Lechmere – First Street – Binney Street – Third Street – Kendall Square</p>
3C	Washington / McGrath	<p>Sullivan Square – Washington – East Somerville – McGrath – Lechmere – First Street – Binney Street – Third Street – Kendall Square</p>
3D	Rutherford / Gilmore	<p>Sullivan Square – Rutherford Avenue – Gilmore Bridge – Charles River Dam Road – Lechmere – First Street – Binney Street – Third Street – Kendall Square</p>
3E	Grand Junction Option	<p>(From McGrath) – Grand Junction Line – Binney Street – Kendall Square</p> <p>NOTE: Concerns about feasibility</p>
3F	Land Blvd Option	<p>(From Lechmere) – Charles River Dam Road – Land Boulevard – Binney Street – Third Street – Kendall Square</p>
3G	Binney Street Option	<p>(From Third Street) – Binney Street – Broadway – Kendall Square</p> <p>NOTE: Concerns about feasibility</p>
3H	Assembly Option	<p>Wellington – Grand Union – Sullivan – Washington (continues alignment of 3A)</p> <p>NOTE: Concerns about feasibility</p>

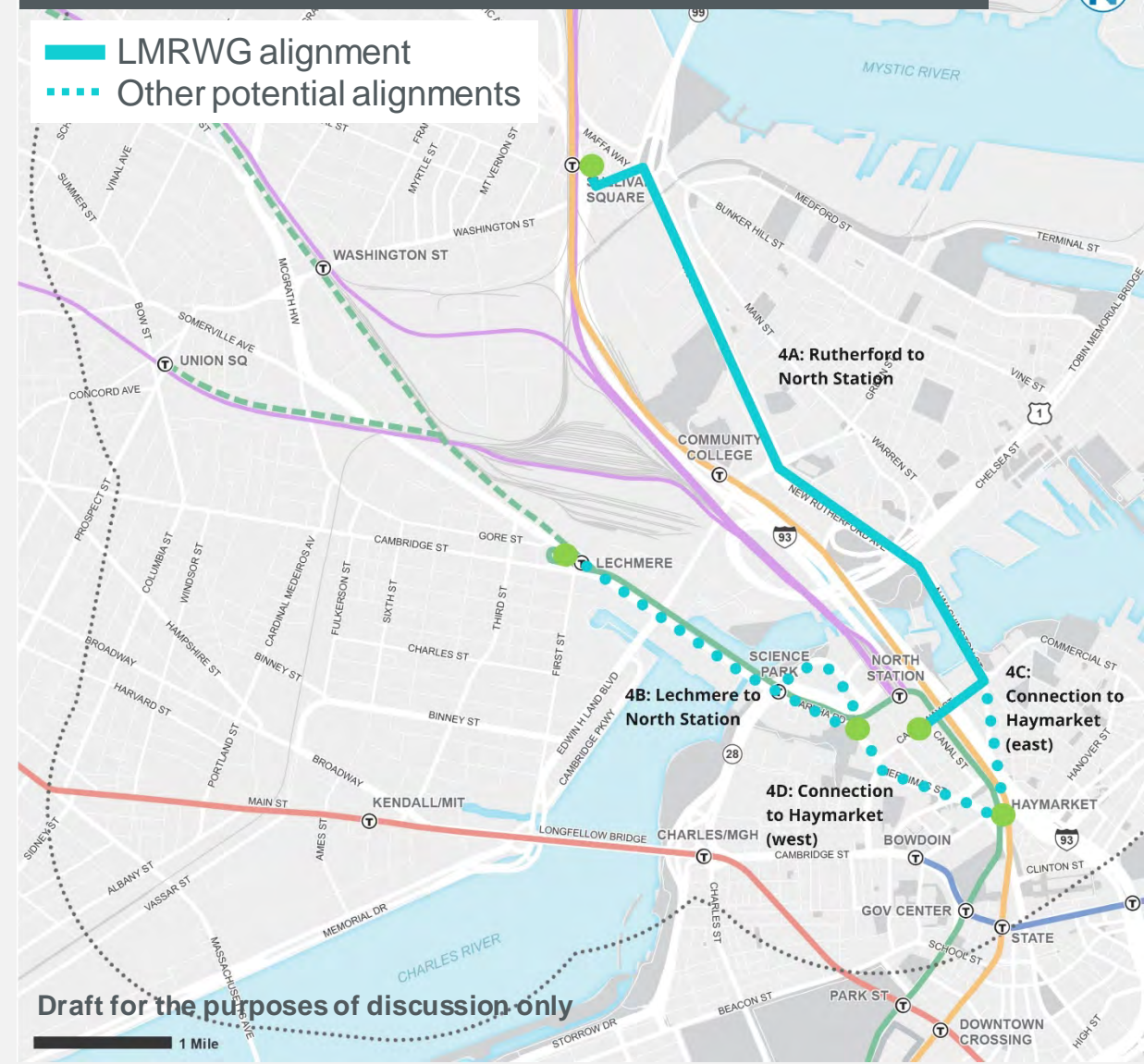
Section 3: Orange Line to Kendall



Potential Alignments: Section 4

Code	Name	Description
4A	Rutherford to North Station	Sullivan Square – Rutherford Avenue – Washington Street – North Station Preferred Alignment from Lower Mystic Study
4B	Lechmere to North Station	Lechmere – Charles River Dam Road – Marth Street – North Station – Nashua Street
4C	Connection to Haymarket Option (from the east)	(From Washington Street Bridge) – Washington Street – Haymarket
4D	Connection to Haymarket (from the west)	(From Washington Street or North Station) – Merrimac Street – Haymarket

Section 4: Orange Line to Downtown Boston



WORKING GROUP DISCUSSION

1. Are these the right set of alignments to be looking at?
2. Is there anything that needs to be added?
3. Does this discussion trigger any additional thoughts or ideas on the evaluation process?

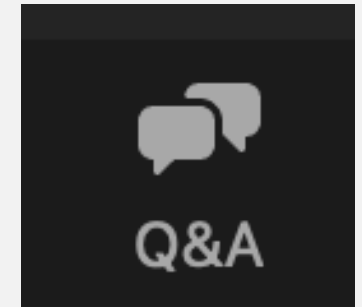
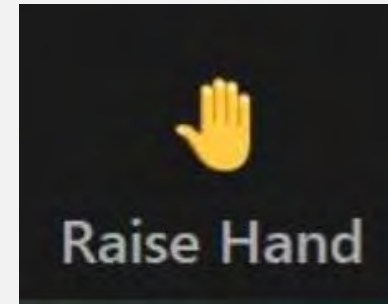
SL – Extension

Alternatives Analysis

Public Comment

Public Comment

- Please share only one question or comment at a time
- Use the “**Q+A**” button to submit a typed question or comment
- Press the “**Raise Hand**” button to share your question or comment verbally. Wait for the moderator to recognize and unmute you before speaking.
- If you have joined by phone only, you may “raise your hand” by pressing the star button and then nine (*9)
- *After you speak, we will lower your hand and you will be muted to allow the team to respond and provide opportunities for others to participate*
- Comments may also be sent to SLX@mbta.com.



***Chat** is reserved for
Working Group only*

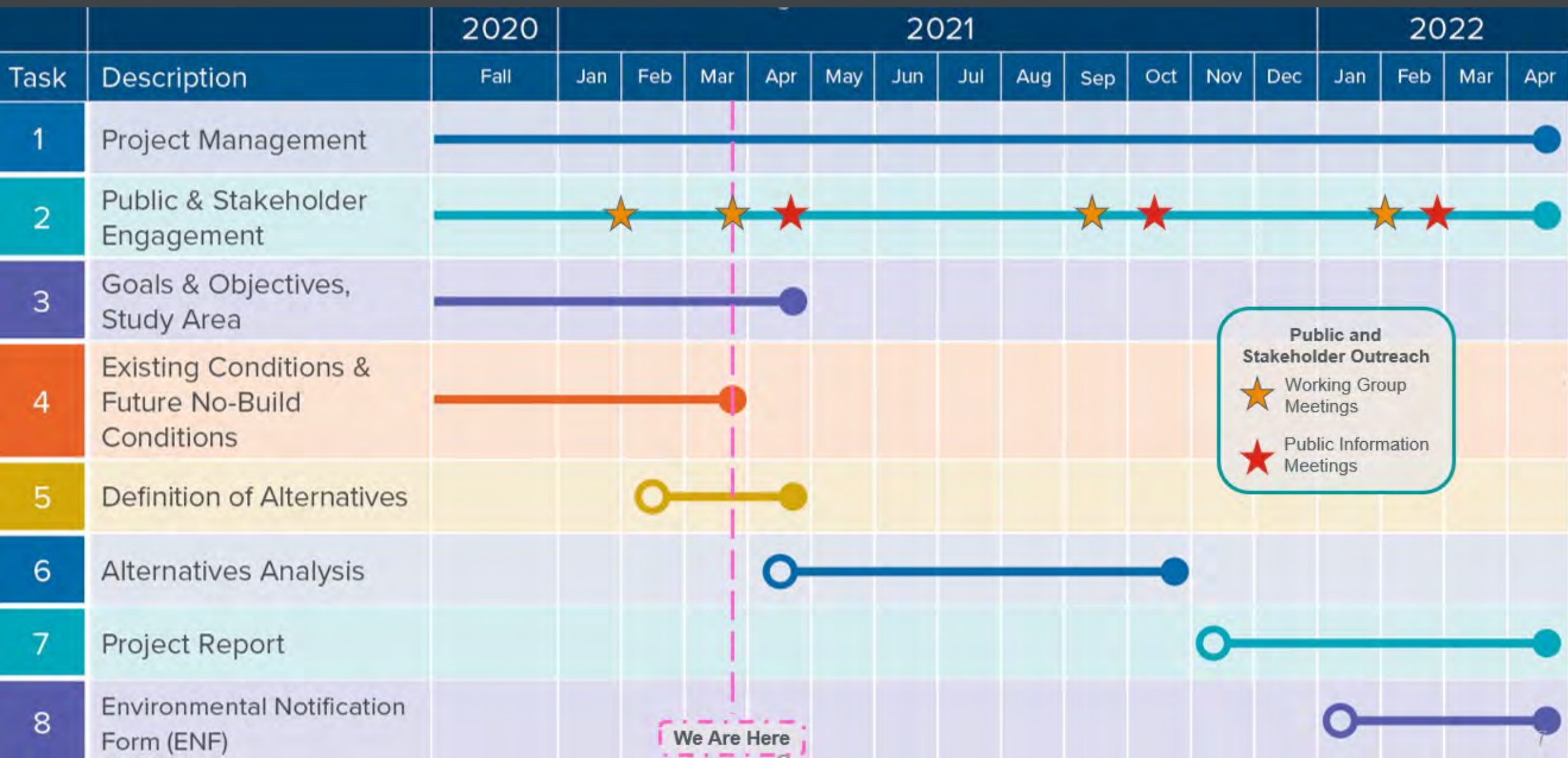
Discussion

Questions/Thoughts on Work Done to Date

WORKING GROUP DISCUSSION

Do you have any additional thoughts
and comments about the things we
discussed today?

Project Schedule



Next Steps

Between Now and our Next Meeting we Intend To:

- Hold our First Public Meeting
- Refine the Alignments to be Studied
- Begin the Evaluation of Alignments (Tier 1)

SL – Extension

Alternatives Analysis

THANK YOU!



For questions and comments
please email slx@mbta.com