ROUTE 1A CORRIDOR STUDY

massDOT
Massachusetts Department of Transportation
Office of Transportation Planning

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TABLE OF CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

EXECUTIVE SUMMARY

The Executive Summary provides a high-level overview of the Route 1A Corridor Study's background, its purpose – including study goals and objectives, the development and evaluation of alternative strategies for achieving the purpose, comparative assessment of the study alternatives, key findings, and next steps.

E-I. INTRODUCTION AND STUDY CONTEXT

The Massachusetts Department of Transportation (MassDOT) undertook the Route 1A Corridor Study to provide a comprehensive review of the 2.3-mile segment of Route 1A and the parallel rail corridor owned by MassDOT and the Massachusetts Bay Transportation Authority (MBTA). This conceptual study is intended to provide a full public planning process for the railroad corridor, which was the subject of a proposal by Cargo Ventures, an industrial property owner in the corridor. That proposal entailed the re-use of the rail corridor for a Bypass Road with a Shared Use Path along the Chelsea Creek waterfront to support the redevelopment of several corridor properties between Curtis Street and Tomasello Way.

The Route 1A Corridor Study is intended to review potential uses of the inactive MassDOT and MBTA rail parcels located between Route 1A and Chelsea Creek and to evaluate opportunities for improving transportation, recreation, and resilience in the corridor between East Boston's Day Square and Revere's Bell Circle.

The Route 1A Corridor Study:

- Assesses the present and future geographic, infrastructure, demographic, transportation, resiliency, sustainability, safety, and environmental conditions in the Route 1A corridor.
- Evaluates two potential improvement alternatives for reuse of the rail parcels:
  - Alternative 1) Shared Use Path Only
  - Alternative 2) Bypass Road with Shared Use Path
- Evaluates two potential improvement sub alternatives connecting the Shared Use Path along the rail parcels with Bell Circle
  - Option A) On-Street Connection via Harris Street and Beach Street
  - Option B) Shared Use Path via Revere Beach Parkway Ramp
- Summarizes the projected benefits, costs, impacts, and trade-offs of the improvement alternatives.

Critically, the study has entailed a comprehensive civic engagement process involving residents, businesses, elected officials, and other stakeholders in a series of meetings and through online interaction. This included cooperative development of the following goals for the project:

- Safety
  - Improving safety for people using all modes of transportation (walking, biking, transit, driving, etc.) in the corridor
- Connectivity
  - Expanding and enhancing connectivity for users of all modes of transportation along and across the corridor
  - Balancing local and regional transportation needs and improving the reliability of freight transportation
- Sustainability and Climate Change Resiliency
  - Improving air quality and access to public and natural resources
  - Enhancing the resilience of corridor infrastructure and the surrounding area
- Equity
  - Enhancing corridor benefits while reducing corridor burdens on Environmental Justice communities

MassDOT recognizes that the linear rail corridor, which is currently inactive, could be put to better use, including being reconfigured for transportation, recreation, waterfront access, and/or coastal resilience purposes. A redeveloped corridor could enable a range of uses, including enhanced access to the Chelsea Creek waterfront and natural amenities, improved transportation connections, new open/green space, and/or access to the regional multimodal network. The rail corridor is well situated to provide public access to the adjacent Chelsea Creek waterfront, to provide a link in the regional greenway network, and/or connect industrial freight uses along the west side of Route 1A to the Martin A. Coughlin Bypass Road and Logan Airport.

In order to ensure that the Route 1A Corridor Study process was fully informed by input from the community and relevant public agencies, the project team engaged East Boston and Revere residents, stakeholders, and public officials throughout the study process. The project team established a study Working Group that comprised representatives of community ad stakeholder groups and met with the Working Group five times at key study milestones. The project team also held five Community Meetings, and met periodically with an inter-agency group made up of representatives from interested local, regional, and state agencies.

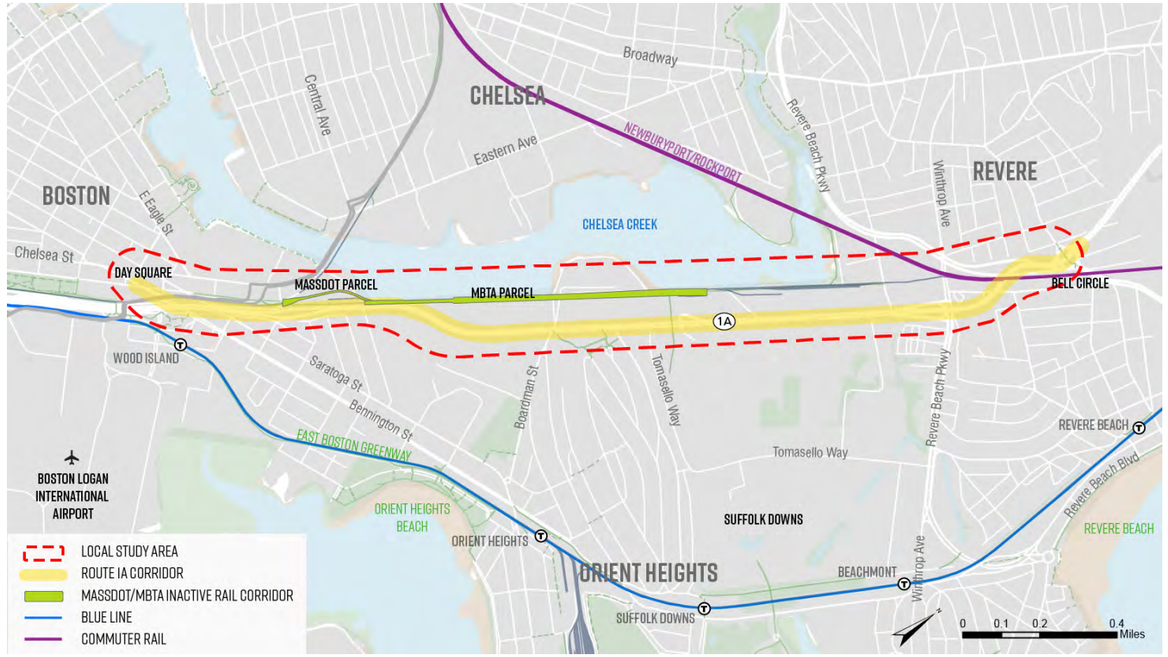


Figure ES–1. Study Area Overview Map

E-2. EXISTING AND FUTURE CONDITIONS

The study area lies between Chelsea Creek and Route 1A, spanning a linear corridor between East Boston's Chelsea Street and Revere's Bell Circle, shown in Figure ES–1. The regional study area includes communities and neighborhoods surrounding the study area, such as East Boston, Downtown Boston, Chelsea, and Revere, as well as major nearby transportation facilities, such as Logan Airport, Interstate-90, Route 60, Route 16, the MBTA Rapid Transit Blue Line, the MBTA Newburyport/Rockport Commuter Rail Line, and the regional shared use path network, as shown in Figure ES–2.

- **Demographics and Community Character.** Neighborhoods near the Route 1A corridor have grown substantially in population in recent years, including significant increases throughout East Boston, Revere and Chelsea. This trend is projected to continue in the future, including growth in established neighborhoods and in newly-developed or redeveloped areas, such as Suffolk Downs. Most study area neighborhoods have significant populations of foreign-born residents. Every census tract in the study area meets one or more of the environmental justice criteria (minority, low median income,

limited English proficiency) established by the Metropolitan Area Planning Council (MAPC), with many of these criteria at much higher levels near the study corridor than the regional average. Public health data indicate that residents of the study area corridor are characterized by health challenges, including higher rates of diabetes, heart disease, and pediatric asthma than average for the regional population.

- **Land Use / Community Character.** This area has been historically shaped by the presence of industrial uses, many of which stem from their proximity to Chelsea Creek, the Designated Port Area (DPA), and Logan Airport. Parcels directly adjacent to the study corridor are commercial, industrial, airport-related, and very auto-oriented. Aside from the heavy industrial presence along Route 1A and the rail corridor, land uses within East Boston, Revere, and Chelsea are predominantly residential, with commercial establishments located along main street corridors. In addition to the Suffolk Downs Redevelopment, another economic development area (EDA) has been established by the City of Boston in the study corridor: the McClellan Highway EDA is intended to facilitate environmentally sound economic growth and development of retail, office, research and development, and light industrial and manufacturing uses.
- **Transportation Characteristics.**
  - Roadway. The corridor's key intersections with Route 1A – Curtis Street, Boardman Street, Tomasello Way, and Revere Beach Parkway – currently operate during morning and evening commuter peak hours at Level of Service (F), the worst level. This congestion is forecast to continue in the future, even with mitigation measurements implemented from the Suffolk Downs Redevelopment.

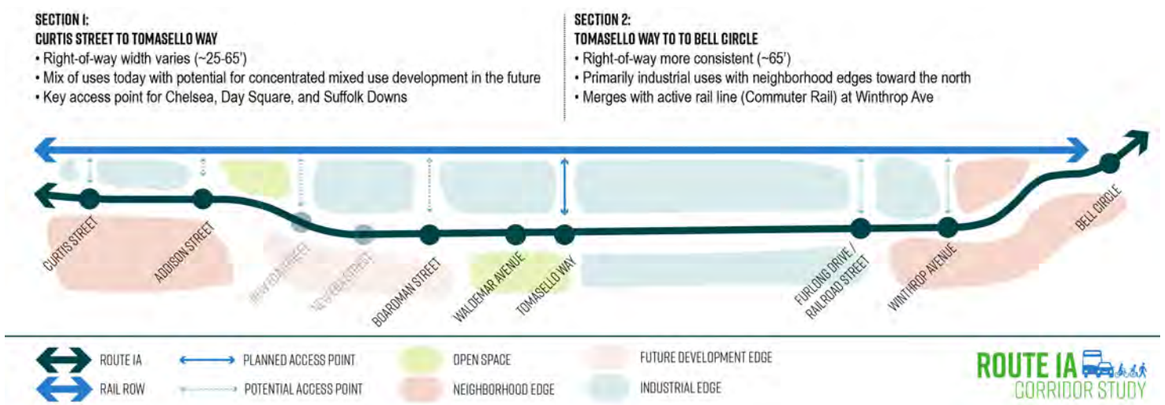


Figure ES–2. Study Corridor Existing Conditions

  - Vehicles. Approximately 35,000 cars traverse Route 1A in the study area daily in the northbound direction and approximately 40,000 in the southbound direction. Speeds are highest at the southern end of the corridor in both directions, where traffic operates with little or no traffic signals or controls. Route 1A traffic speeds are much lower in the center of the corridor in the vicinity of the signalized intersection at Boardman Street and at the northern end of the corridor near Bell Circle. Most vehicle trips along Route 1A have their northern terminus in the communities immediately north of the study area – Lynn and Revere – with their southern ends primarily at Logan Airport, in Downtown Boston, or in the Seaport District/South Boston. Trucks comprise roughly 6.2 percent of Route 1A's daily study area traffic: 2022 count data reveals 1,860 trucks in the northbound direction and 1,800 in the southbound direction. By 2040, these traffic volumes are projected to increase by approximately 30 percent in the northbound direction and by 43 percent in the southbound direction.
  - Rail Corridor. The inactive railroad corridor runs approximately 1.8 miles, from the vicinity of Curtis Street at the southern end to the Newburyport/Rockport Commuter Rail line near Winthrop Avenue at the northern end. Widths along the rail corridor vary considerably, ranging from an absolute minimum of approximately 27 feet near Addison Street to a maximum of nearly 85 feet near the Boston – Revere municipal line. Key pinch points include the area between Curtis Street and Addison Street (27 feet) and a brief segment in Revere that narrows to 47 feet wide near the Hampton Inn and Furlong Drive.
  - Safety. MassDOT crash data shows that there have been four fatal crashes on Route 1A in the study corridor in the last five years, including a pedestrian fatality in 2020. These have all occurred at the southern end of the corridor, where average speeds are higher. Bell Circle is also designated as a high pedestrian crash location by MassDOT.
  - Pedestrian. The existing study area pedestrian infrastructure generally provides basic pedestrian access. There are sidewalks along Route 1A; these are mostly asphalt sidewalks roughly 8 – 10 feet wide, in varying condition including segments in disrepair. Pedestrian connections along Route 1A span many wide crossings at intersections and driveways. Most of the pedestrian crossings lack curb ramps that

are compliant with the Americans with Disabilities Act (ADA) standards, with the exception of a few recently-improved locations, such as Boardman Street, Winthrop Avenue, and Bell Circle. In addition, safe crossings of Route 1A are widely-spaced and provide few opportunities to cross the highway or access the Chelsea Creek waterfront. There are only four locations where pedestrians can safely cross Route 1A between Curtis Street and Bell Circle, and these are spaced at wide intervals. Furthermore, half of the existing study area bus stops are not near crosswalks. MassDOT's Potential for Walkable Trips (PWT) analysis tool indicates significant potential for short walkable trips along the corridor; this potential is anticipated to increase with the projected increases in population and development.

- Bicycle. Based on the Level of Traffic Stress (LTS) bicycle conditions methodology, all of the existing roadways in the study corridor are considered high stress for cyclists. There is no dedicated space for bicycle users on Route 1A, which is designed as a major arterial/express highway that prioritizes motor vehicle volumes and speed. As a result, the facility is generally uncomfortable for bicyclists, who are vulnerable users operating at a significantly lower speed. Wide lanes, gentle sweeping curves, a median that often features a guard rail, limited intersections and signals, and few buildings or trees fronting the road all encourage high vehicle speeds and contribute to uncomfortable conditions for bicyclists.
- Transit. Although the nearby Blue Line is heavily used, transit options along the Route 1A corridor are limited. The existing MBTA Route 450 bus service has very low ridership, with fewer than 10 boardings per hour during peak periods in the study area. This is due to several factors: infrequent buses with service mainly during commuter peak periods; vehicle-oriented land uses and development patterns; and difficult pedestrian access. As a result, the MBTA's Bus Network Redesign process has recommended eliminating bus service in the Route 1A corridor.

E-3. ALTERNATIVES DEVELOPMENT AND ANALYSIS

Alternatives Development

The Route 1A Study includes an alternatives analysis to identify and evaluate potential solutions to the study's core purpose: examining a range of transportation uses of the MassDOT / MBTA-owned rail right-of-way (ROW) lying between Chelsea Creek and Route 1A.

To address this issue, the alternatives analysis process defines key infrastructure and operational elements that identify differentiating features. Such distinguishing characteristics enable assessment of potential alternatives' benefits, costs, and impacts. These key parameters comprise the following components:

- Corridor Configuration
- Corridor Usage and Access
- Route 1A Mainline and Intersection Design
- Access to Waterfront
- Climate Resilience Features
- Corridor Constraints

The study identifies a number of potential combinations of Shared Use Path and Bypass Road configurations and designs along the rail ROW between Curtis Street and Railroad Street. The study screens these options and narrows them down to two principal alternatives for detailed analysis. Each alternative includes a new Shared Use Path, open space, and flood protection infrastructure adjacent to Chelsea Creek. In addition, the study reviews two potential options (A & B) for developing Shared Use Path connections at the northern end of the study corridor, from the rail ROW at Railroad Street (near Route 1A) to Bell Circle. The range of alternatives is summarized in Figure ES–3.

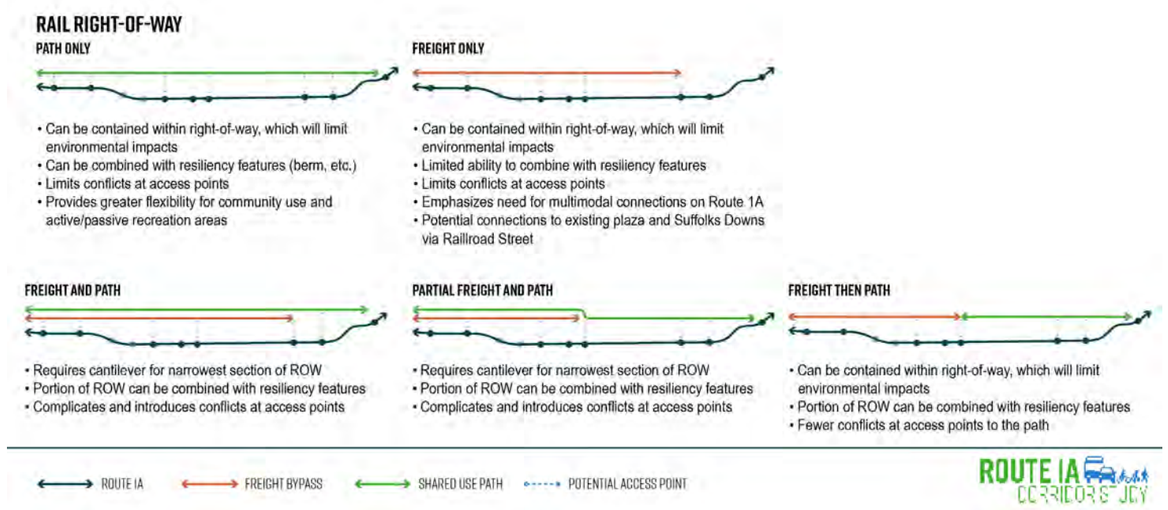


Figure ES–3. Conceptual Alternatives Screening

The study alternatives comprise a set of different configuration and alignment options in each of three primary corridor segments; two of these segments each have two alignment alternatives, while the middle segment has only one alignment proposal. From south to north, these segments are:

- Curtis Street – Jughandle/Tomasello
  - Alternative 1 – Shared Use Path Only would implement a new Shared Use Path along the publicly-owned rail parcels. The Shared Use Path would pass beneath the Curtis Street Bridge in the railroad corridor, in a low-speed shared roadway space between the CubeSmart building and Route 1A, then into the main railroad corridor north of Addison Street. North of Addison Street, the Shared Use Path would pass through the narrowest segment of the railroad corridor; beyond this pinch point, the railroad ROW widens and would enable separate paths for walking and biking along with park space within the railroad corridor. The Shared Use Path would be elevated on a raised berm to provide flood protection against sea level rise and storm surge from Chelsea Creek, and would cross Boardman Street at grade. Alternative 1 of this segment is shown in Figure ES–4.
  - Alternative 2 – Bypass Road with Shared Use Path would create a corridor that integrates a new vehicle Bypass Road with a Shared Use Path in a combined alignment in the railroad corridor. The Bypass Road would connect to the existing Martin A. Coughlin Bypass Road near Day Square, and would pass beneath the Curtis Street Bridge in the railroad corridor. This would not leave adequate width beneath the Curtis Street Bridge for the Shared Use Path, which would need to cross Curtis Street at grade with a signalized crossing. North of Curtis Street, the Bypass Road would pass to the west of the CubeSmart building, while the Shared Use Path would operate in a low-speed shared roadway space between the CubeSmart building and Route 1A. The Bypass Road would occupy the narrow pinch point

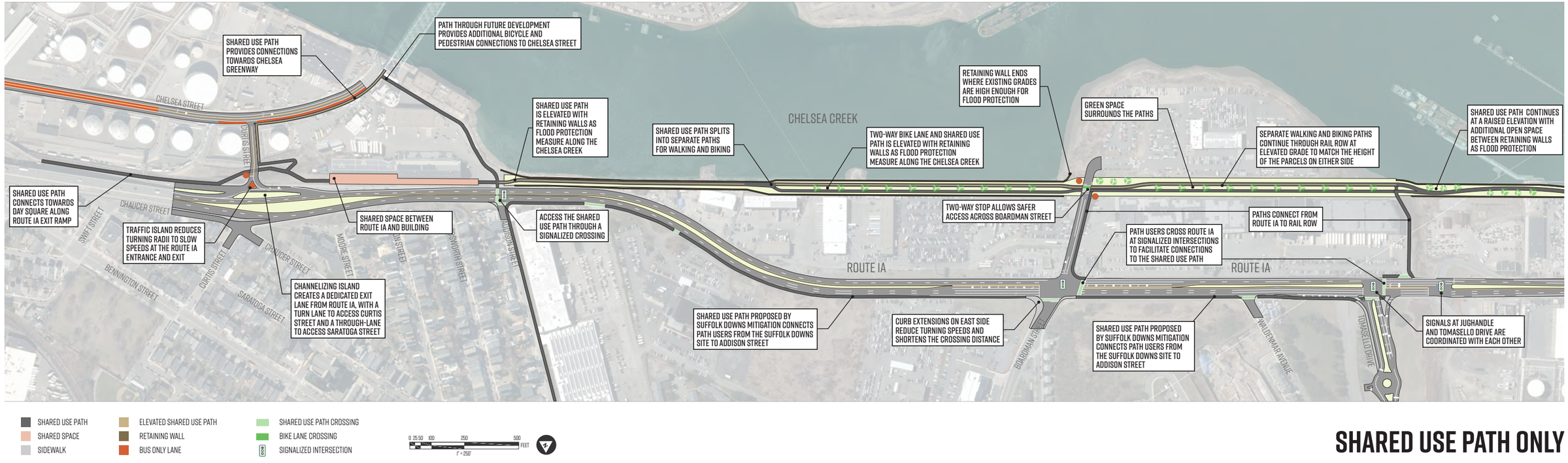
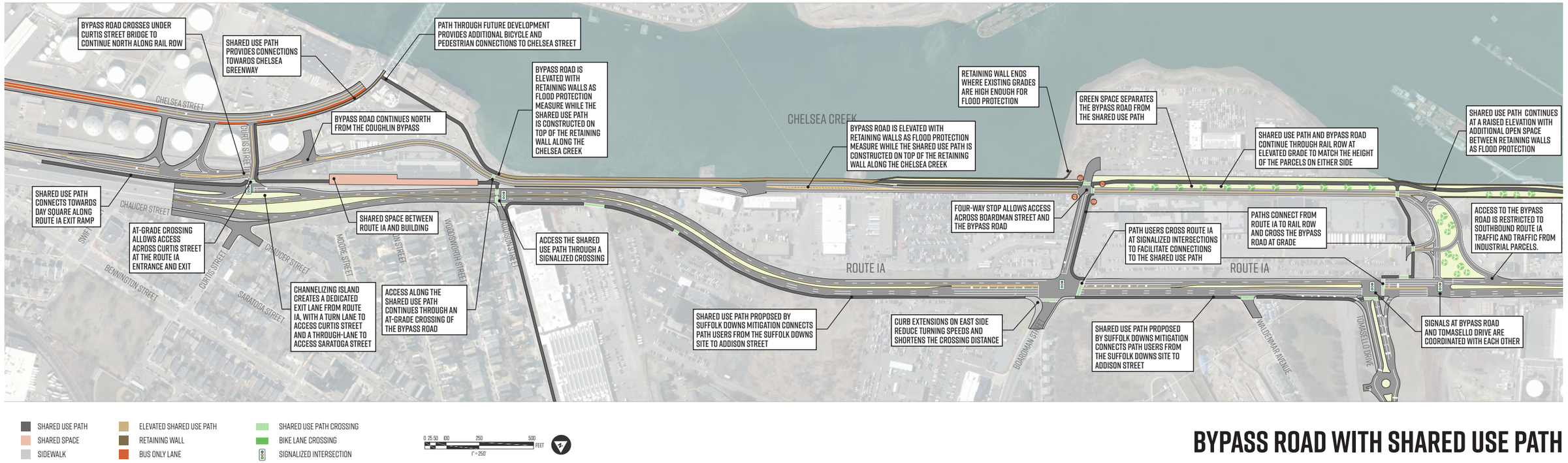


Figure ES–4. Shared Use Path Only – Curtis Street to Jughandle/Tomasello



BYPASS ROAD WITH SHARED USE PATH

Figure ES–5. Bypass Road with Shared Use Path (SUP) – Curtis Street to Jughandle/Tomasello

north of Addison Street, while the Shared Use Path would be cantilevered over Chelsea Creek from an elevate flood wall. The Bypass Road would cross Boardman Street at grade and connect with the Jughandle intersection at the Suffolk Downs reconfigured Tomasello Drive intersection. This would be the northern terminus of the Bypass Road, while the Shared Use Path would continue north of the Jughandle roadway in the railroad alignment. Alternative 1 of this segment is shown in Figure ES–5.

- Jughandle/Tomasello – Winthrop Avenue
  - The Shared Use Path continue north along the railroad alignment to Railroad Street, where it would cross the active MBTA Newburyport / Rockport Commuter Rail Line via a reconstructed pedestrian/bicycle only bridge. It would continue north along a two-way Separated Shared Use Path along the eastern edge of Revere Beach Parkway. This would require conversion of one of the three northbound lanes on Revere Beach Parkway into a Shared Use Path, which would connect to the Revere Beach Parkway/Winthrop Avenue/Harris Street intersection.
- Winthrop Avenue – Bell Circle
  - Option A – On-Street Bicycle Accommodation. Bicyclists would continue north on Harris Street via shared lane markings to Beach Street, then along painted bike lanes on Beach Street to Bell Circle.
  - Option B – Shared Use Path via Revere Beach Parkway Ramp. The Shared Use Path would cross Winthrop Avenue and continue in a separated alignment on the eastern side of the Revere Beach Parkway northbound ramp to Bell Circle. The Shared Use Path would use the space currently occupied by ramp's eastern side and right travel lane.

Both alternatives and options between Jughandle/Tomasello and Bell Circle is shown in Figure ES–6.

Alternatives Analysis

These alternatives were evaluated using a set of quantifiable metrics based upon the project's purpose and need, study goals, and alternative objectives. Table ES–1 provides a summary of the comparative evaluation of the benefits, impacts, and costs of Alternatives 1 and 2.

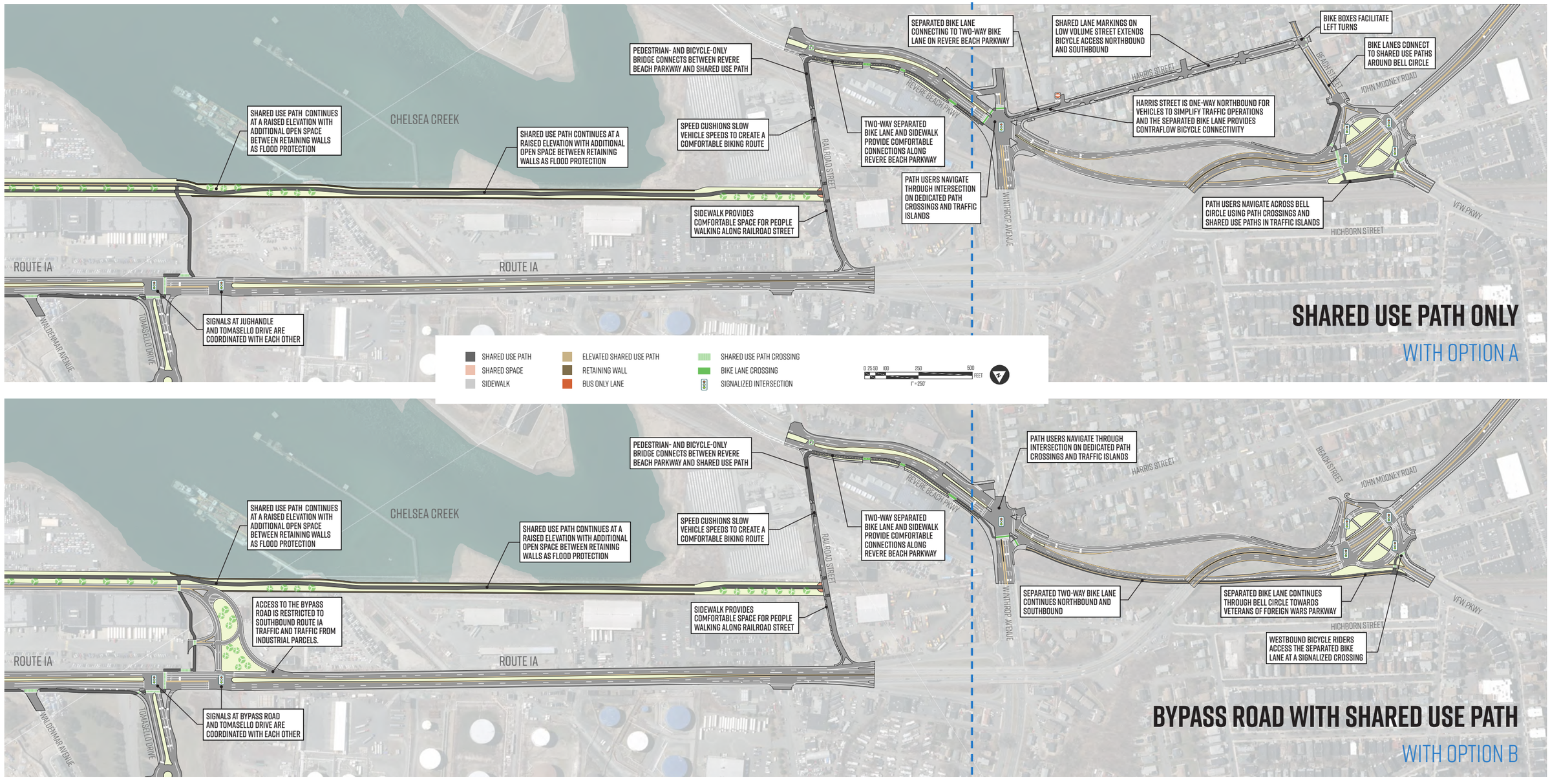


Figure ES–6. Shared Use Path Only and Bypass Road with Shared Use Path (SUP) – Jughandle/Tomasello to Bell Circle

STUDY GOAL	TYPE OF ANALYSIS	#1 – SHARED USE PATH ONLY	#2 – BYPASS ROAD WITH PATH	KEY FINDING(S)
Safety	Crash Modification Factors	Somewhat Better	Somewhat Better	Both alternatives would improve multimodal safety at Curtis Street and Addison Street. For Shared Use Path users, Alt. 1 would eliminate potential interactions present in Alt. 2 (at-grade crossings, trucks).
Safety	Pedestrian Comfort *	Better than Base	Somewhat Better	Shared Use Path in Alt. 1 would cross beneath Curtis Street; offer a vehicle-free transportation corridor with more open space; and enable separation for those walking and biking in select areas.
Safety	Bicyclist Comfort *	Better than Base	Somewhat Better	Both alternatives would provide a continuous Shared Use Path. Alt. 1 would allow a wider biking facility, greater comfort (more distance from vehicles) and some separation from those walking.
Connectivity	Intersection Operations	Comparable to Base	Somewhat Better	Assuming nearly 35 percent of projected truck traffic (1,870 daily trips) is diverted off the mainline, the Alt. 2 Bypass Road would offer traffic congestion and delays reduction benefits for Route 1A drivers.
Connectivity	Truck Volumes (Routing & Travel Time Savings)	Comparable to Base	Somewhat Better	Bypass Road would offer reliability benefits for trucks, the majority of would be to/from Logan Airport. Travel times would be shorter during peak periods (SB AM, NB PM), but otherwise comparable to 1A.
Connectivity	Employment Access	Somewhat Better	Somewhat Better	Both alternatives would realize benefits for residents via better connections to jobs in Revere, Chelsea, Everett and Lynn. Land access west of Bell Circle or north of Day Square would improve.
Connectivity	Non-Motorized Access *	Better than Base	Better than Base	Both alternatives would offer new public access to the shoreline of Chelsea Creek, with a waterfront Shared Use Path serving as a new signature link within the regional trail network.
Environment, Resilience	Flood Mitigation / Heat Island	Better than Base	Somewhat Better	With 3.4 more acres of green space, Alt. 1 would offer comparative heat benefits given less pavement. Permeable path pavement could be used in either alternative to maximize stormwater infiltration.
Environment, Resilience	Flood Protection	Somewhat Better	Somewhat Better	Both alternatives provide protection from 2070 100-year floods, including sea level rise, via shoreline seawalls that maintain a 16-foot elevation and include an extra two-foot lip.
Environment, Resilience	Environmental Impact	Comparable to Base	Somewhat Worse	Alt. 1 would introduce less encroachment into wetland areas. With a history of adjacent industrial uses, the need to perform more extensive (wider) or intensive (deeper) work along the corridor in order to support Alt. 2's Bypass Road would introduce a greater potential for the release of OHM.
Environment, Resilience	Restore or Improve Access to and Use of Natural Resources	Better than Base	Somewhat Better	Both alternatives would improve natural resources and provide access to waterfront spaces for public use. Alt. 1 would create more green space and limit vehicle conflicts.
Equity	Truck Impacts on Noise & Air Quality – Residents	Comparable to Base	Somewhat Better	The Alt. 2 Bypass Road would lower truck volumes along Route 1A south of Tomasello, reducing truck-related noise in west Orient Heights and at two nearby sensitive receptors.
Equity	Truck Impacts on Noise & Air Quality – Path Users	Somewhat Better	Somewhat Worse	As a result of greater separation, including from trucks using the Bypass Road, as well as among walking and biking (where possible), the Alt. 1 Shared Use Path would offer a quieter, cleaner user experience.
Equity	Public Health (Benefits for Corridor EJ Communities)	Better than Base	Somewhat Better	Both alternatives would improve neighborhood connections for EJ communities. Alt. 1 would preserve more open space and better enhance access to Chelsea Creek via a lower stress facility.
Feasibility	Estimated Cost	Somewhat Worse	Worse	Capital cost of Alt. 2 would be approximately 50 percent higher ($35.5 M), driven by the high-cost cantilevered segment of the Shared Use Path (Boardman to Addison Street), and the Bypass Road.
Feasibility	Permitting / General Feasibility	Somewhat Worse	Worse	Both alternatives would vastly improve public access, recreation, and open space uses at the waterfront while also requiring authorization to perform work within regulated areas. Given the inclusion of a non-water dependent use (i.e., proposed Bypass Road) in areas that are assumed to remain in the Chelsea Creek DPA, Alt. 2 would likely encounter greater difficulty in permitting under Chapter 91.

** At Bell Circle, Option B (Revere Beach Parkway) would provide Shared Use Path users with direct access to east side amenities while Option A (Harris Street) would afford better access for residents to the west.*

Table ES–1. Comparative Evaluation and Key Findings Summary

E-4. KEY FINDINGS AND NEXT STEPS

Study Findings

The following is a high-level summary of the key features and differentiating factors of the alternatives that will help decision-makers determine a preferred approach for advancing improvements in the study corridor.

- **Safety:** Both alternatives would provide safety improvements relative to the No-Build condition.
  - **Crash Modification Factors.** Both Alternative 1 (Shared Use Path Only) and Alternative 2 (Bypass Road with Shared Use Path) would entail safety improvements at the Curtis Street and Addison Street intersections to address existing safety issues.
  - **Pedestrian and Bicycle Conflicts.** Both alternatives would provide a Shared Use Path with new pedestrian and bicycle access opportunities that have low vehicular conflicts. However, compared to the Shared Use Path Only Alternative, the Bypass Road with Shared Use Path Alternative would introduce potential path user conflicts with Bypass Road vehicles at major access points (e.g., jughandle near Tomasello Drive, Boardman Street, and Addison Street). In Alternative 2, path users also would have an additional at-grade crossing with vehicles turning on to and off of Route 1A at Curtis Street, while Shared Use Path users would cross using an underpass in Alternative 1.
    - **Northern Options for Pedestrian and Bicycle Access.** Option A would provide on-street bicycle accommodations via Sharrows on Harris Street, a low-volume residential street, along with a limited segment of sidewalk-level bike lane on the southern approach to Revere Beach Parkway. Option B would provide a lower-conflict separated bike path along the Revere Beach Parkway ramp to Bell Circle.
- **Connectivity:** By providing a new Shared Use Path, both alternatives would provide better pedestrian and bicycle connectivity relative to the No-Build condition. By building a new vehicular Bypass Road that enables connections between Route 1A, industrial businesses, and Logan International Airport, Alternative 2 would provide better connectivity for authorized vehicles, including heavy trucks and potentially buses and other vehicles.
  - **Truck Connectivity.** The analysis indicates that the Bypass Road proposed in Alternative 2 would attract nearly 1,900 truck trips per day – just under 35 percent of the total truck volume projected for 2040 on Route 1A and from the Cargo Ventures project proposal. AM and PM peak hour truck diversions to the Bypass Road are projected to be 109 (42 northbound, 67 southbound) and 103 (50 northbound, 53 southbound), respectively.
  - **Traffic Congestion.** The traffic analysis found that enabling these truck diversions from Route 1A to the new Bypass Road would result in a minor reduction in delay and congestion on Route 1A in Alternative 2.
  - **Pedestrian and Bicycle Access.** In both alternatives, the Shared Use Path would enable better access to recreational facilities and natural resources for residents near the study corridor. The Shared Use Path in both alternatives would also provide better non-motorized access for residents to employment opportunities and other destinations.
- **Environment and Resilience:** Both alternatives would improve the environmental and resilience performance for the railroad corridor relative to the No-Build condition.
  - **Flood Protection.** Both alternatives would provide an elevated transportation facility that would serve as a barrier to sea level rise and storm surge for two key neighborhood flood pathways to the north and south of Orient Heights.
  - **Flood Mitigation and Urban Heat Mitigation.** Alternative 1 would provide roughly 3.4 additional acres of green space, because it would not need to provide a paved vehicular Bypass Road in addition to the Shared Use Path. This green space would help mitigate urban heat impacts and would provide additional permeable surface for flood absorption and mitigation.
  - **Environmental Impact.** The Alternative 2 Bypass Road may have greater construction impacts than Alternative 1, such as more disruption of the Chelsea Creek and areas contaminated with hazardous materials.
  - **Access to Natural Resources.** Both alternatives would provide much better access

to the Chelsea Creek than the No-Build condition. However, Alternative 1 would provide more waterfront open space and natural resources than Alternative 2.

- **Equity:** Both alternatives would enhance access to natural resources and recreational facilities and provide equity benefits for residents of the Environmental Justice surrounding the study corridor relative to No-Build conditions.
  - **Truck Impacts on Noise & Air Quality for East Boston Residents.** By enabling the diversion of an estimated 35 percent of trucks from Route 1A to the Bypass Road, Alternative 2 would displace a significant proportion of heavy vehicle-generated noise and air pollution farther from the East Boston residential neighborhoods that are closest to Route 1A.
  - **Truck Impacts on Noise & Air Quality for Shared Use Path Users.** By keeping all trucks on Route 1A rather than on an adjacent Bypass Road, Alternative 1 would keep truck-related noise and air pollution away from the Shared Use Path and the park spaces along Chelsea Creek.
  - **Public Health Benefits.** Alternative 1 would provide more park space and green space along the Shared Use Path, and more recreational green space. The Shared Use Path Only Alternative would also provide a more comfortable, lower-stress experience for non-motorized users, particularly pedestrians, by offering separate pathways for bicyclists and pedestrians from just north of Addison Steet (230 McClellan Highway) to just south of the jughandle (480 McClellan Highway).
- **Feasibility and Implementation:** The No-Build, status quo scenario represents the most "feasible" option, with the fewest challenges. Both alternatives would entail significant capital cost, as well as project impacts that would require significant permitting in this environmentally sensitive waterfront corridor.
  - **Capital Cost.** Both alternatives have significant capital costs for rehabilitating the railroad corridor, raising the profile for flood control, and building the infrastructure associated with the proposed alternative. Alternative 2 is roughly 50 percent more expensive, due to the cost associated with building the Bypass Road in addition to the Shared Use Path, as well as building the cantilevered segment of the Shared Use Path.
  - **Environmental Permitting.** Both alternatives would entail significant permitting related to potential environmental impacts, especially for construction in filled tidelands under Chapter 91 regulations. In addition, portions of the study corridor are within the Chelsea Creek Designated Port Area (DPA); both alternatives would entail new uses in a DPA, whose regulations place restrictions on construction of non-water-dependent uses.

Figure ES–7. Route 1A Along Chelsea Creek -- Alternative 1 (Shared Use Path Only)

Figure ES–8. Route 1A Along Chelsea Creek -- Alternative 2 (Freight Bypass with Shared Use Path)

Next Steps

While MassDOT is not pursuing a project at this time, the Route 1A Corridor Study represents an important early step in the project implementation process. If other parties or agencies choose to move forward with any elements of this study, the following is a brief discussion of the project implementation process, with a focus on key elements of the project definition and project development phases that are specific to the Route 1A Corridor Study and implementation of an infrastructure improvement project in the MassDOT – MBTA railroad corridor.

Planning and Project Definition

The Route 1A Corridor Study is a long-term planning study that is intended to help to define a potential project in the railroad corridor along the Chelsea Creek. It identifies a transportation need, goal, or concept, and begins to translate that general concept into a more clearly defined project. The Route 1A Study substantially advances the project definition and conceptual planning for this project by defining the project purpose and need; its geographic scope; potential alternative solutions for addressing the purpose and need; and the project's high-level benefits, impacts, and costs.

However, there is still not a clearly defined project for the railroad corridor. There is still work required to engage corridor stakeholders and community residents, build consensus on a project approach, and advance the findings of the Route 1A Corridor Study to define a preferred project. In order to further advance a potential project in the Route 1A corridor, there are several additional issues that should be considered in later phases of project development:

- **Truck Diversions on Local Streets.** Community residents and stakeholders have expressed concerns about existing truck diversions from Route 1A onto local streets such as Bennington Street and Saratoga Street.
- **Potential for Induced Traffic Demand from the Bypass Road.** Another concern that has been raised is the potential for the Alternative 2 Bypass Road to generate additional traffic on Route 1A through "induced demand," which is the potential for added roadway capacity to attract new traffic.
- **Chapter 91 and Designated Port Area Compliance.** Because much of the study area is in filled tidelands, any infrastructure improvements in the railroad corridor would be subject to Chapter 91 licensing; any segments within the Chelsea Creek Designated Port Area (DPA) would need to comply with relevant regulations.
- **Railroad Corridor Ownership and Property Issues.** MassDOT and the MBTA own the inactive railroad corridor from the northern end of the Martin A. Coughlin Bypass Road to its junction with the Newburyport/Rockport Commuter Rail Line. There are several challenges to developing an infrastructure project in the corridor, including ownership by separate entities, varying width of the corridor, impacts to abutters, property encroachment by abutters, and any temporary or permanent easements or property takings that might be required.

In addition to considering these issues, any next steps resulting from the Route 1A Corridor Study should be advanced in the context of other planning efforts and development projects near the study corridor. These include the City of Boston's PLAN: East Boston process, Climate Ready Boston, Suffolk Downs Redevelopment and its associated transportation mitigation program, and other development proposals, including those by CargoVentures and Trident Logistics.

Project Development and Design

Once a project has been clearly defined through planning, and a consensus on the project approach has been achieved through civic and stakeholder engagement, the project proponent can move forward into the project development and design phase. This process comprises preliminary design and environmental review/permitting, followed by final design.

Given the waterfront location of the project corridor, the significant permitting regime associated with the Chapter 91 Massachusetts Public Waterfront Act, and potential environmental sensitivity, the environmental review and permitting for the project will be especially critical. This includes the following issues and considerations:

- **Federal Environmental Review.** The primary vehicle for federal environmental review and permitting is the National Environmental Policy Act (NEPA) process, likely through the Federal Highway Administration (FHWA). Other relevant federal environmental review process include Section 106 historical approval through the Massachusetts Historical Commission, Section 404 Clean Water Act permit that would be issued by the U.S. Army Corps of Engineers, and National Pollutant Discharge Elimination System (NPDES) permit issued by the U.S. Environmental Protection Agency.
- **State and Local Environmental Review.** A project in the Route 1A corridor would also require state and local environmental review. The environmental review regime for

the Commonwealth of Massachusetts is governed primarily by the Executive Office of Energy and Environmental Affairs (EEA), and it comprises several review and permitting processes led by EEA component agencies. These include the following:

- Massachusetts Environmental Policy Act (MEPA), which establishes "impact thresholds" for the level of environmental review required for a given project.
- A project in the railroad corridor would require a Chapter 91 Waterways License from the Massachusetts Department of Environmental Protection (MassDEP). The Chapter 91 Waterways Program is designed to preserve public access to Commonwealth tidelands, use of public facilities along the waterfront, and public enjoyment along the water's edge, while protecting tidelands and waterways for water-dependent uses, such as commercial fishing, shipping, marinas, and other water-related activities.
- Portions of the railroad corridor and potential project area remain within the Chelsea Creek Designated Port Area (DPA), which imposes restrictions on use of DPA zones to preserve maritime infrastructure, often built at significant public cost, for continued water-dependent use.
- Other State and Local Permits. Other state and local environmental permits would likely be required for a project resulting from the Route 1A Corridor Study, including but not limited to Stormwater Management Standards Compliance Review (MassDEP), Massachusetts Contingency Plan Review/Preliminary Determination (MassDEP), Notification Prior to Construction or Demolition (MassDEP), Section 401 Water Quality Certificate (MassDEP), Order of Conditions under the MA Wetlands Protection Act and local wetlands bylaws (Conservation Commission for all municipalities affected by the project), and building permits (Massachusetts Department of Public Safety, municipal governments)

Capital Planning and Project Funding

Funding for the project would need to be secured, preferably in parallel with permitting activities. Not only do federal, local, and state planning processes need to be followed for permitting approvals, but additional processes are required to be navigated for the project to receive public funding. It is likely that both state and federal funding sources would be required in order to implement a project of this scale. A number of different funding and grant sources at each level could offer potential funding. Typically, federal sources would fund 80 percent of transportation infrastructure capital costs, while the remaining 20 percent would be funded by state or local contributions.

- Federal Funding Programs. A number of programs and grants could comprise the 80 percent federal contribution for the project, including the use of federal "formula" funding that the federal government allocates to the Commonwealth of Massachusetts, as well as through competitive discretionary grant. The recently passed Infrastructure Investment and Jobs Act (IIJA) offers a range of such competitive grant programs that might be suitable for a project that could come out of the Route 1A Corridor Study, such as the Carbon Reduction Program, Safe Street and Roads for All, Reconnecting Communities, and Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation.
- State Funding and Capital Planning Processes. As with federal funding, there are many potential state funding sources and programs that provide funding for improvements in the study corridor. The MassDOT Capital Investment Plan (CIP), a five-year rolling capital plan that the Commonwealth's transportation investment priorities, establishes the policies and priorities that guide state transportation funding. A project arising out of the Route 1A Corridor Study would need to compete for state funding through the CIP process.

1. INTRODUCTION AND STUDY CONTEXT

This chapter describes the study corridor, its purpose and need, and the outreach process used to develop and refine the study's goals, objectives, and alternatives. The section concludes with a review of previous studies relevant to the study area in East Boston and Revere.

1.1. STUDY PURPOSE AND NEED

The Route 1A Corridor Study was undertaken to assess the potential uses of an inactive railroad corridor in East Boston and Revere, located between Route 1A and Chelsea Creek, as well as to evaluate the Route 1A Corridor between East Boston's Day Square and Revere's Bell Circle. This study evaluates existing and anticipated future conditions in the study corridor, and it identifies opportunities to enhance the corridor and its surrounding communities. This entails proposals to improve walking, biking, and transit conditions in the study area; address safety deficiencies for all users; accommodate freight needs and increasing travel demand on the corridor due to new development; and mitigate potential impacts of climate change.

This study was initiated in response to a proposal to purchase and re-use the railroad right-of-way, which is owned jointly by the Massachusetts Department of Transportation (MassDOT) and the Massachusetts Bay Transportation Authority (MBTA). The MBTA issued an Invitation to Bid for the property that received one bid: from Cargo Ventures, which is a private real estate development and property management firm for industrial properties. Cargo Ventures submitted a proposal to use the rail corridor for a Bypass Road with Shared Use Path along the Chelsea Creek waterfront that would support the redevelopment of several properties along the corridor between Curtis Street and Tomasello Way. In response to concerns about the lack of a public planning process for the corridor, the MBTA and MassDOT suspended disposition of the property until this Route 1A Corridor Study could be conducted.

The study corridor lies between Chelsea Creek and Route 1A, spanning a linear corridor between East Boston's Chelsea Street and Revere's Bell Circle (Figure 1–1). As with much of East Boston and parts of Revere, the MBTA/MassDOT inactive rail parcels and the adjacent Route 1A roadway corridor are adjacent to water (Chelsea Creek), industrial uses, and properties that serve the airport or shipping industries. The regional study area includes communities and neighborhoods surrounding the study area, such as East Boston, Downtown Boston, Chelsea, and Revere, as well as major nearby transportation facilities, such as Logan Airport, Interstate 90, Route 60, Route 16, the MBTA Rapid Transit Blue Line, the MBTA Newburyport/Rockport Commuter Rail Line, and the regional shared use path network.

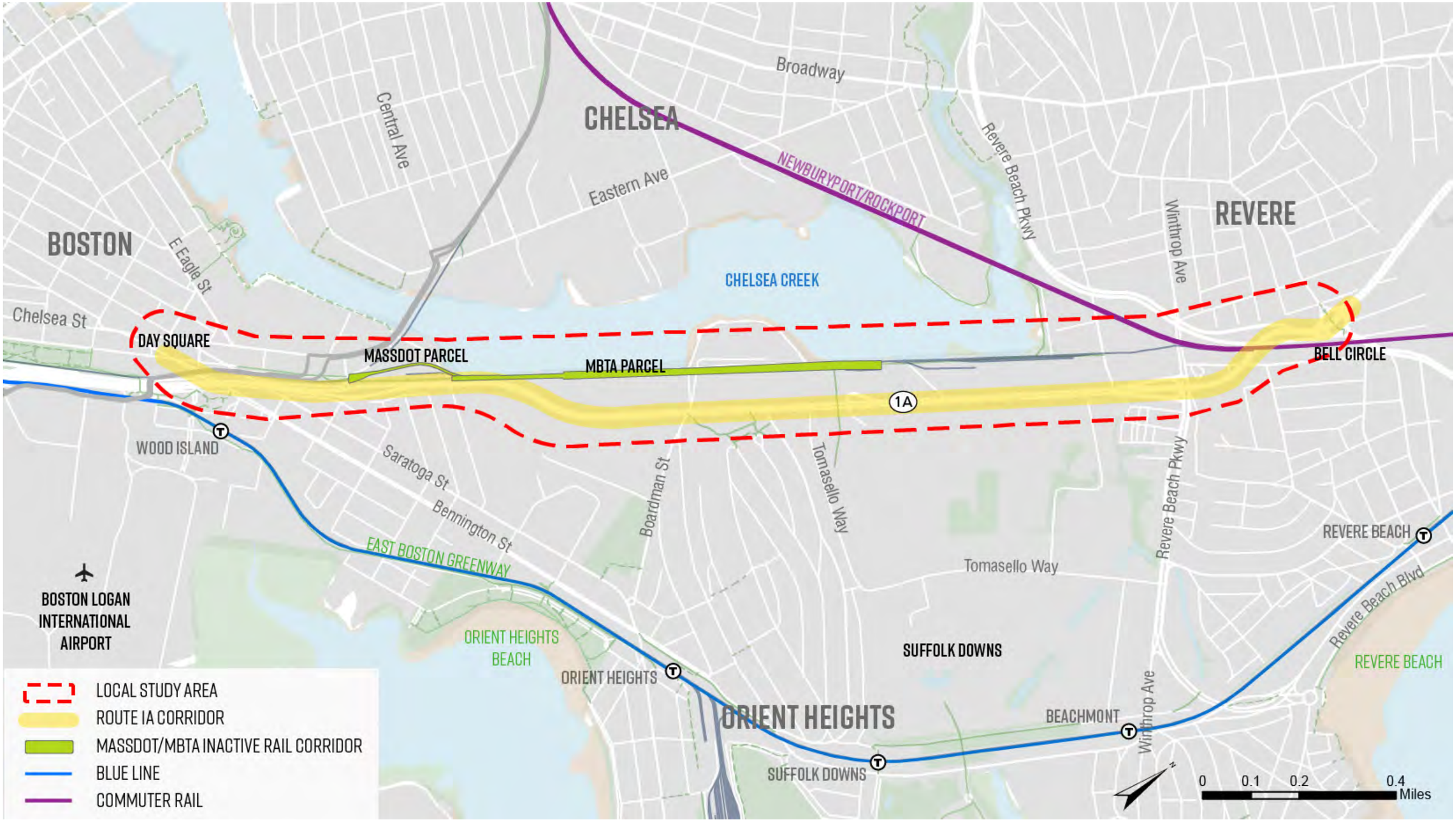


Figure 1–1. Study Area Overview Map

The primary focus of this study is the MassDOT/MBTA-owned rail right-of-way (Figure 1–2), which lies along the eastern shore of Chelsea Creek and runs parallel to Route 1A for roughly one mile. While this Commonwealth-owned corridor currently contains inactive linear parcels that are overgrown and mostly inaccessible from the public right-of-way, the rail corridor could be reconfigured to serve a range of new uses (e.g., multimodal transportation, recreation, creek access, and/or coastal resilience).

Beyond connecting the North Shore with Logan Airport and Downtown Boston, the Route 1A highway also provides essential local and regional connectivity for residents and employees of East Boston and Revere. However, it is a wide, high-speed corridor (Figure 1–3) that generates noise and air quality impacts, and acts as a barrier between Chelsea Creek and the surrounding communities. At the same time, study corridor residents are more likely to be transit-dependent, with East Boston residents driving alone at only two-thirds the frequency of the average Bostonian.[1]

In the future, the study area is expected to experience significant changes to its land use and travel patterns, with the redevelopment of the former Suffolk Downs horse-racing track, located just east of the study area between Tomasello Way and Winthrop Avenue. This major project, slated for implementation over the next 20 years, will bring a projected 16.2 million square feet of residential, commercial, retail, and hotel development (Figure 1–4). The Suffolk Downs redevelopment's travel demand will have a large influence on the study corridor; at the same time, the development project will fund transportation system improvements to mitigate

Figure 1–2. Inactive MBTA and MassDOT-Owned Railway Parcels

Figure 1–3. Heavy Vehicular Traffic on Route 1A

1 PLAN: East Boston & American Community Survey Data

Figure 1–4. Suffolk Downs Redevelopment Master Plan (HYM Group, August 2020 Public Presentation)

the impacts of this additional travel demand.

The Route 1A Corridor Study is intended to evaluate the 2.3-mile segment of Route 1A and the MBTA / MassDOT inactive rail parcels to evaluate designs and strategies that improve access, connectivity, and safety for all users; facilitate transit and freight mobility; address environmental and public health concerns; and enhance quality of life.

Some of the Route 1A corridor's unique challenges include:

- Route 1A retains many of its original geometric features from over 80 years ago, resulting in geometric designs and ramp configurations that are substandard relative to modern highway design criteria and the current demands on the roadway.
- The increased risk of future flooding from more intense rainfall and projected sea level rise increases the risk of environmental concerns with respect to the fuel tanks and other nearby industrial infrastructure (Figure 1–5), while the area's heat islands have impacts on the resilience of transportation infrastructure, as well as quality of life for residents.
- These transportation and environmental issues elevate health risks for the Environmental Justice (EJ) communities nearby.
- North Shore-based travelers are highly dependent on Route 1A to access Logan Airport, the South Boston Seaport, and Downtown Boston due to a lack of parallel routes and the highway's connections to the only two Boston Harbor crossings.
- Travel demand from the Suffolk Downs redevelopment and other new land uses must be accommodated, while still improving non-motorized user access and safety.
- The inactive rail parcel must balance flooding mitigation needs with multimodal demands for the corridor.

The Route 1A Corridor Study offers many opportunities to overcome these challenges and transform multimodal access and safety for the study area and region through strategies that include:

- Building upon Suffolk Downs' multimodal mitigation proposals to advance regional multimodal improvements.
- Evaluating the potential for the inactive rail corridor along Chelsea Creek to provide new multimodal connections, with access to natural amenities, improved connectivity to the regional multimodal network, and flood mitigation infrastructure.
- Reviewing transit and freight demand, and identifying opportunities to enhance connectivity for transit and freight.
- Identifying opportunities for enhanced multimodal connections to Chelsea and the Mill Creek Riverwalk.

Figure 1–5. Industrial Uses Adjacent to Study Area

1.2. GOALS AND OBJECTIVES

1.2.1. Goals

- The study has four overarching key goal areas – safety, multimodal access, equity, and sustainability and climate change resilience. The following are key principles for assessing study outcomes relative to each of these goal areas:
- Safety
  - Improving safety for people using all modes of transportation (walking, biking, transit, driving, etc.)
- Connectivity
  - Expanding and enhancing connectivity for users of all modes of transportation along and across the corridor
  - Balancing local and regional transportation needs and improving the reliability of freight transportation
- Sustainability and Climate Change Resiliency
  - Improving air quality and access to public and natural resources
  - Enhancing the resilience of corridor infrastructure and the surrounding area
- Equity
  - Enhancing corridor benefits while reducing corridor burdens on Environmental Justice communities

1.2.2. Objectives

Objectives are derived from the specific goals enumerated in the previous section, establishing specific and measurable outcomes that help achieve the goals.

Safety objectives:

- Goal: Improving safety for people using all modes of transportation (walking, biking, transit, driving, etc.)
  - Reduce the number of crashes on the Route 1A corridor, particularly fatal and serious injury crashes
  - Address safety deficiencies at high crash locations
  - Reduce incidences of speeding throughout the Route 1A corridor
  - Reduce the number of conflict points at intersections
  - Address sight line obstructions along the Route 1A corridor
  - Increase Level of Comfort/reduce the Level of Stress for vulnerable road users

Connectivity objectives:

- Goal: Expanding and enhancing connectivity for users of all modes of transportation along and across the corridor
  - Provide new and/or upgraded pedestrian and bicycle facilities along and across Route 1A
  - Connect gaps in the regional bicycle network
  - Improve existing or create new pedestrian and bicycle connections between residential neighborhoods and the Chelsea Creek
  - Make transit service more reliable and accessible along Route 1A, and provide bus stop amenities throughout the corridor
- Goal: Balancing local and regional transportation needs and improving the reliability of freight transportation:
  - Address delay at congested “bottleneck” locations
  - Facilitate freight movements through the Route 1A corridor and between freight origins and destinations along the corridor
  - Minimize local impacts of regional traffic and cut-through traffic in neighborhoods

Sustainability and Climate Change Resilience objectives:

- Goal: Improving air quality and access to public and natural resources
  - Reduce air pollution and greenhouse gas emissions
  - Provide new and/or improved natural resources including open space and waterfront access
  - Reduce the adverse environmental impacts of freight movements in the study corridor
- Goal: Enhancing the resilience of corridor infrastructure and the surrounding area:
  - Mitigate flooding pathways and infiltration points from Sea Level Rise and storm surge

- Improve drainage, reduce flooding from precipitation, and reduce run off

Equity objectives:

- Goal: Enhancing corridor benefits while reducing corridor burdens on Environmental Justice communities
  - Reduce burdens on Environmental Justice communities (e.g., public health burdens, transportation impact)
  - Prioritize strategies that benefit Environmental Justice communities (e.g., increased access to public space, reduce cut-through traffic)

1.3. CIVIC ENGAGEMENT

The project team worked to engage East Boston and Revere residents and stakeholders throughout the study process. As shown in Figure 1–6, the civic engagement and public involvement process extended throughout the study process. The project team reached out to residents and stakeholders and provided a range of engagement opportunities at each study milestone, including existing and future conditions, key issues and opportunities, development of alternatives that encompass a range of possible solutions, evaluation of these alternatives relative to criteria that reflect the study goals, and presentation of findings from that evaluation.

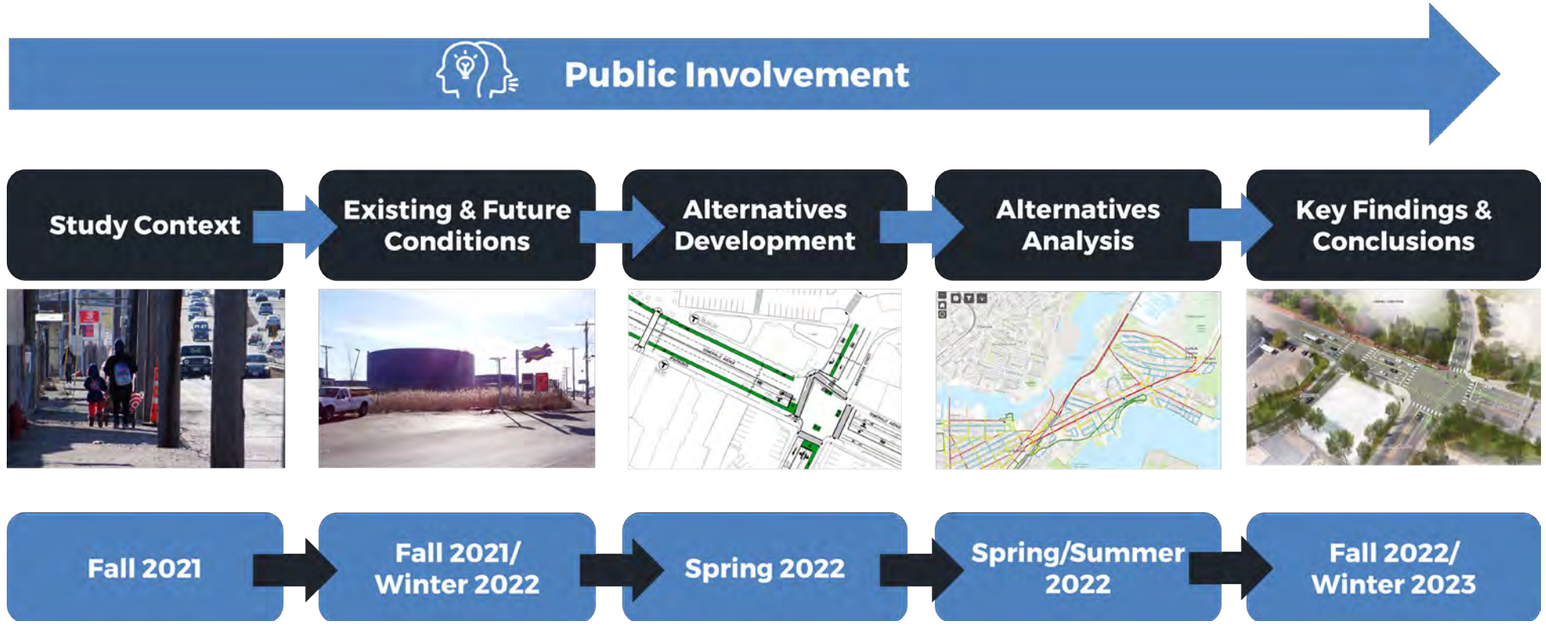


Figure 1–6. Public Engagement Process

Civic Engagement Strategies

Throughout the process, the project team relied on equitable outreach and engagement activities with key community and stakeholder groups, agencies, elected officials and the public to guide the course of this study. Several civic engagement strategies were pursued, including a study Working Group, public meetings, community group briefings, online and printed materials, and other creative approaches, as well as interagency coordination.

Study Working Group

The Route 1A Working Group serves an important role for this study. Working Group participants come from a range of organizations and entities and represent a variety of interests and positions. Working Group members have brought community knowledge and expertise to the study meetings, which has enabled them to provide valuable input on the study alternatives and analysis.

In addition to municipal and legislative officials, the study team invited representatives of the following organizations to constitute the Working Group:

- Orient Heights Neighborhood Council
- East Boston Foundation
- East Boston Social Centers
- Centro Presente
- GreenRoots
- Harborkeepers
- Neighborhood of Affordable Housing
- Livable Streets Alliance
- Salesian Boys and Girls Club of East Boston
- Eagle Hill Civic Association
- East Boston Health Center

A Working Group protocol for meetings, which outlined roles and responsibilities, was adopted at the first meeting, held on October 20, 2021. Project background, goals, objectives, and previous studies were also reviewed during this meeting. The goals and objectives were reviewed and refined at the second Working Group meeting on December 1, 2021, and an analysis of existing conditions within

the rail corridor was presented. The meeting on March 30, 2022, featured a review of public outreach, the presentation of stakeholder survey results, a discussion of future conditions forecast for the rail corridor, and an initial discussion of the framework for development of alternatives. The fourth Working Group meeting, held on June 16, 2022, saw the presentation of preliminary alternatives for the rail corridor. The results of the alternatives analysis for the rail corridor and findings of the study were presented at a fifth Working Group meeting on December 15, 2022.

Interagency Coordination

Prior to Working Group meetings, the project team convened sessions for public agency representatives with responsibility for some aspect of the Route 1A study corridor. These Interagency Meetings provided agency stakeholders with a preview of Working Group meeting materials, and an opportunity for feedback to ensure that relevant issues would be addressed. Interagency meetings were held prior to Working Group meetings on October 13, 2021; November 30, 2021; March 29, 2022; and June 7, 2022. The following entities composed this team:

- MassDOT (Highway Design, Traffic and Safety, District 4, District 6)
- MBTA (Real Estate, Service Planning, Transit Priority)
- MassPort
- Metropolitan Area Planning Council (MAPC)
- Coastal Zone Management
- City of Boston
  - Boston Planning & Development Agency (BPDA)
  - Boston Transportation Department (BTD)
  - Boston Environment Department
- City of Revere

Public Meetings and Workshops

MassDOT hosted a total of five public meetings at key project milestones.

- At the first public meeting, held on December 8, 2021, project schedule, goals, and objectives were reviewed. Existing conditions in the study area were presented and small group discussions were held to gather feedback.
- The second public meeting, held on April 11, 2022, reviewed public outreach measures conducted during the winter, including presentations to community groups and the presentation of results from an online engagement tool, a sample of which is shown below in Figure 1–7. Future conditions forecast for the rail corridor were presented and small group discussions occurred to gather public feedback.
- Preliminary alternatives for the rail corridor were presented at the third public meeting (June 21, 2022) and feedback was gathered from small discussion groups.
- Two final public meetings were held, on December 20, 2022 and January 19, 2023; the results of the evaluation of alternatives and findings of the study were presented at these meetings.

Study Outreach Materials and Information

The project team drafted website materials, media releases and email messages to promote the study and invite community participation. Meeting materials and communications presented complex information in easy-to-understand, nontechnical language and graphics in identified languages to serve the diverse East Boston and Revere communities. Most meetings incorporated polls related to travel habits, preferences, goals, and objectives.

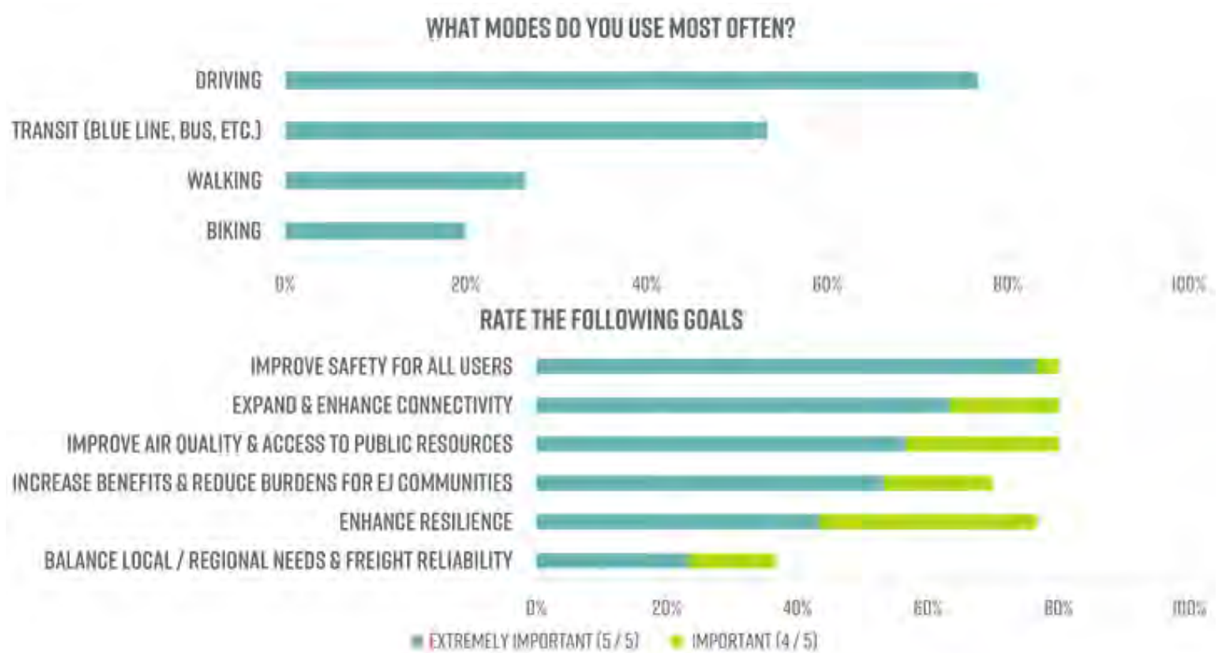


Figure 1–7. Sample Public Engagement Response Results

1.4. RELEVANT STUDIES, PROJECTS, AND INITIATIVES

The project team conducted an extensive review of the study area, including the planning, development, and infrastructure context of the study corridor. This section reviews previous transportation, planning, and development studies, their data and analysis, and their proposals and recommendations in order to understand the infrastructure, regulatory, and market conditions in the corridor. Additionally, such examination provides valuable insight into and lessons from prior efforts to improve portions of the study area.

1.4.1. PLAN: East Boston

PLAN: East Boston is an ongoing planning effort by the Boston Planning and Development Agency (BPDA) to develop specific land use, urban design, and transportation recommendations to guide future investments and growth in the neighborhood. PLAN: East Boston builds upon the City of Boston's comprehensive plan, Imagine Boston, and its transportation master plan, Go Boston 2030, Goals from Go Boston 2030 include:

- Eliminating traffic fatalities and severe injuries
- Ensuring every Bostonian lives within a 10-minute walk of rapid transit, bikeshare, and carshare options
- Reducing Boston residents' average commute time by 10 percent
- Reducing drive alone commute rates by 50 percent and increasing transit use by 33 percent
- Eliminating transportation-related emissions and achieving carbon neutrality by 2050
- Reducing transportation costs for low-income household

The PLAN: East Boston study area includes the segment of Route 1A located within Boston's municipal limits. The plan's existing conditions report, East Boston Today, recognizes the role and impact of regional traffic on the local East Boston transportation network; cut-through traffic resulting from Route 1A's regional connectivity and the safety impacts of this traffic are major concerns for the neighborhood.

An analysis of pre-pandemic (2018-2019) trip patterns demonstrates some of the important interactions between Route 1A and the East Boston neighborhood. Route 1A southbound becomes extremely congested in the morning, especially south of the Route 1A study area at the approach to the harbor tunnels. As a result, regional traffic diverts to local East Boston streets between Day Square and the Sumner Tunnel to avoid congestion.

This analysis also revealed that only 24 percent of weekday morning trips on Route 1A start in East Boston (including the Airport), while 34 percent of these trips originate in the bordering cities of Chelsea, Revere, or Winthrop. Thus, 42 percent of the weekday morning trips on Route 1A in East Boston begin outside of the study area and adjacent cities. The Route 1A corridor is also the site of East Boston's largest hotspot for vehicle crashes (and second-largest hotspot for all-mode crashes) near the intersection with Curtis Street, where several fatal crashes have occurred.

The report's existing conditions section also includes an analysis of transit operations along Route 1A. Travel times on MBTA's Route 20 bus were deemed unreliable on the segment of its trips along Route 1A. The MBTA's Blue Line, which roughly parallels Route 1A between Revere and Downtown Boston, surpasses capacity at peak hours while ridership continues to increase. The SL3, which connects South Station and Chelsea via East Boston, crosses Route 1A between Logan Airport and Chelsea Street via the Martin A. Coughlin Bypass Road. However, SL3 operations can be unreliable due to delays caused by openings of the Chelsea Street Bridge. High ridership on the Silver Line 3 (SL3), as well as Routes 116 and 117, show a strong demand for transit trips between East Boston and Chelsea.

PLAN: East Boston has produced recommendations for neighborhood "Squares and Corridors" and "Neighborhood Residential Areas," while recommendations for the "Waterfront and Evolving Industrial Areas," including areas in the Route 1A corridor, are still pending. Recommendations for the Day Square area, located at the southwestern edge of the study area for the Route 1A Corridor Study, include a bike path along the exit ramp from Route 1A southbound to Saratoga Street, which can provide a connection leading to the Mary Ellen Welch Greenway; dedicated bus lanes along Chelsea Street in both directions; and a new MBTA bus hub in Day Square that would bring SL3 service directly into the square (Figure 1–8).

Farther north on Route 1A, PLAN: East Boston indicates that vehicular access to the Suffolk Downs development would occur primarily via Route 1A, which runs along the western side of the development. Principal transit, biking, and walking connections to the new Suffolk Downs development would be primarily from the east via the Blue Line and Orient Heights neighborhood.

There may also be traffic implications from potential changes to Bennington Street, which roughly parallels Route 1A on the other side of Orient Heights. Concept recommendations

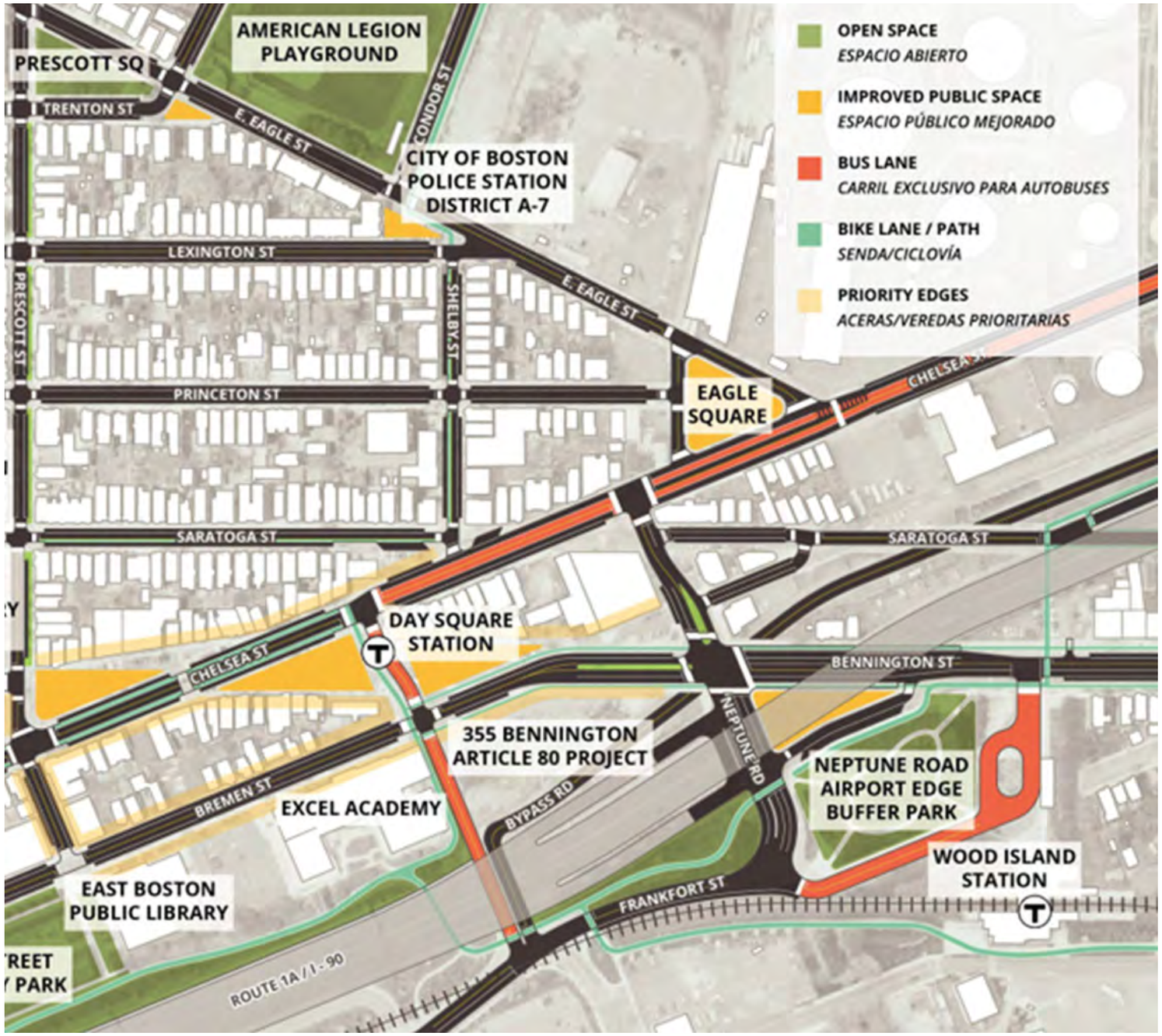


Figure 1–8. Day Square Bus Only Lanes Concepts (PLAN East Boston)

for Bennington Street include reducing the street width from four general traffic through-lanes to two, introducing turn lanes at key intersections in order to address safety issues, and incorporating a fully connected and comfortable bikeway along the street.

1.4.2. Climate Ready Boston

The City of Boston, seeking to mitigate the effects of anticipated sea level rise and extreme weather events, has undertaken the Climate Ready Boston initiative to help city government, residents, businesses, and stakeholders plan for the impacts of climate change. Several East Boston locations that face risks from sea level rise and coastal flooding were identified, including along the study area's Chelsea Creek edge and the Route 1A corridor between Addison and Boardman Street. Using the Boston Harbor Flood Risk Model, the images below (Figure 1–9) show projections of flooding in 2030 and 2070 given anticipated sea level rise.

The Climate Ready Boston process developed and evaluated two coastal resilience solutions designed to protect both East Boston neighborhoods and Route 1A while providing waterfront access, open space, and multiuse trails. One of these scenarios envisioned raising Route 1A by 4 or 5 feet in combination with the construction of a floodwall, while the other scenario proposed the construction of a raised berm in the MBTA / MassDOT rail corridor in conjunction with ecological restoration aimed at reducing flood risk (Figure 1–10).

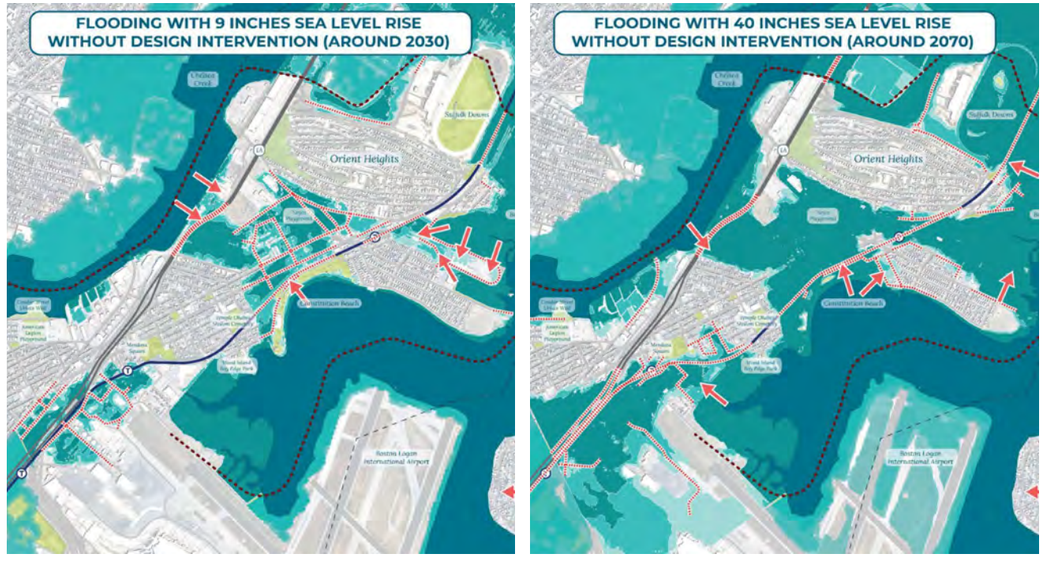


Figure 1–9. Anticipated Flooding Due to Sea Level Rise in East Boston (Climate Ready Boston)

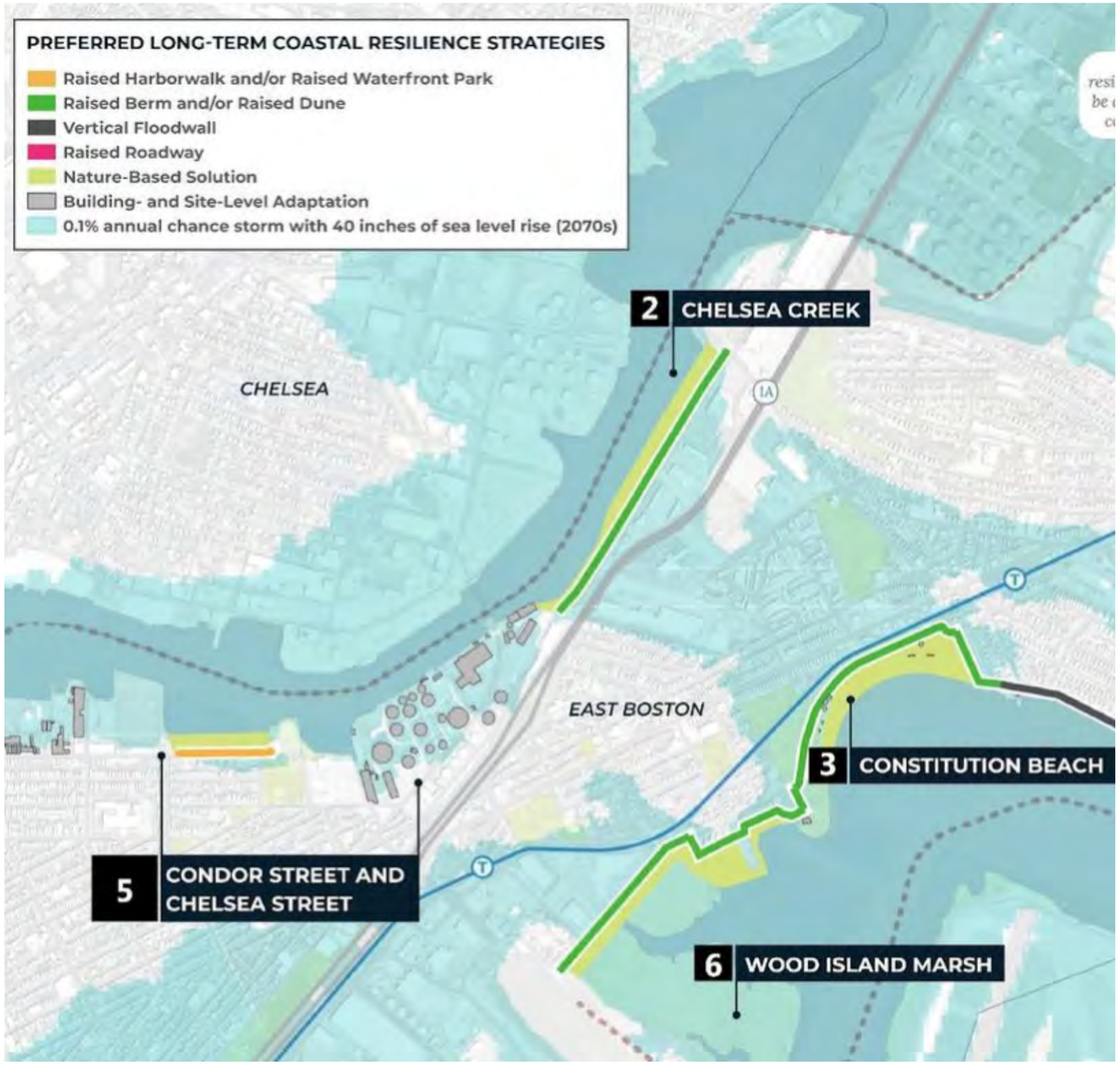


Figure 1–10. Climate Ready Boston Recommended a Raised Berm and/or Dune along the State-Owned Rail Corridor (Climate Ready Boston)

1.4.3. Vision Chelsea Creek

In 2020, a six-month visioning, planning and engagement process occurred to re-imagine the inactive railway line along the industrial shoreline of lower Chelsea Creek. This effort, Vision Chelsea Creek, was conducted as a public-private partnership between The Harborkeepers, a local grassroots East Boston coastal and resilience-building non-profit, and Cargo Ventures, a longtime East Boston landowner, abutter, and primary funder. The project was guided by four primary goals:

- Create an inclusive and accessible waterfront for all
- Balance industrial and community needs along the waterfront
- Enhance Chelsea Creek's ecology and promote environmental justice for all
- Foster social resilience and create a resilient waterfront that reduces risk from climate change

Through detailed site analysis and public input on historic uses and experiences of the Creek, the project assessed opportunities for flood protection, ecological shoreline restoration and stabilization, equitable community access, pedestrian safety, historic preservation, and industrial re-use. Building on prior visioning and community engagement, as well as the City of Boston's overarching climate adaptation efforts, the team developed a set of four resilience and

Figure 1–11. Greenway as Flood Barrier Concept (Vision Chelsea Creek)

Figure 1–12. Urban Boulevard Concept at Addison Street (Vision Chelsea Creek).jpg

climate adaptation strategies for the site geared to enhance waterfront access and ecological vision: a network of greenways, a resilient edge, an urban boulevard, and a working waterfront. These diverse strategies are intended to create transportation network and neighborhood connectivity across Route 1A while improving waterfront accessibility, resiliency, and equity (Figure 1–11).

- A Network of Greenways – expansion of the existing Boston Greenway into an East Boston loop, primary segments being along Chelsea Creek and Bennington with east – west connections through the Orient Heights, Harbor View, and Eagle Hill neighborhoods
- A Resilient Edge – creation of public open spaces and a floodable landscape along Chelsea Creek to mitigate risks and provide access to the waterfront
- An Urban Boulevard – transformation of Route 1A into a safer, more pedestrian and cyclist friendly corridor via traffic calming and design measures, improved neighborhood connections, and a buffered urban edge (Figure 1–12)
- A Working Waterfront – preservation and enhancement of industrial uses along the corridor, as well as the creation of an urban edge buffer while increasing waterfront public access, view corridors, and open space

1.4.4. Next Stop: Revere Master Plan

The Next Stop: Revere Master Plan was developed in 2019 by the City of Revere in partnership with the Metropolitan Area Planning Council (MAPC). This comprehensive master plan developed a citywide vision for Revere over the next 20 years and beyond.

Revere is a city of immigrants from countries all over the globe, with a younger population profile than many communities in the MAPC region. Total population in Revere is projected to keep growing to 2030 and 2040; in spite of its relatively young demographic profile, Revere has an aging population, and the fastest-growing age cohort between now and 2040 is the population aged 65 and over. It's also a diverse community, with over 37 percent of the population identifying as race other than White.

As shown in Figure 1–13, the Next Stop: Revere Master Plan identified multiple future development projects near the Route 1A corridor, including the mixed-use development of Suffolk Downs, the former horse racing track. This project, partially located in Revere, will have a transformational nature and large impact across the city. It's also one of the two biggest transit-oriented development sites in the region, together with Wonderland Park, which bring a large influx of new commercial space and new residential units to the city.

Several other key opportunity sites in the Route 1A corridor study area were also identified in Next Stop: Revere, including: Beachmont MBTA Parking Lot / Wonderland MBTA Parking Lot, Amazon Distribution Center (which opened in 2020), and two undeveloped waterfront parcels.

The City of Revere is also planning to promote pocket park development on City-owned land in neighborhoods to increase open spaces for resilience, social and health benefits. The City would also create indoor and outdoor spaces, linked with programming, to strengthen community connectedness and for public health benefits.

The Next Stop: Revere report also established several goals for transportation and mobility to deal with traffic issues and major pedestrian and bicyclist safety concerns, including:

- Continue to prioritize transportation safety improvements at high crash corridors and intersections
- Continue to improve and expand on- and off-street walking and biking infrastructure in Revere
- Require new residential developments and new large employers to provide activities, incentives, and infrastructure improvements to encourage residents and visitors to travel by public transit, walking, and biking
- Consider modifying parking regulations to make sure parking spaces are being used efficiently and effectively in the downtown area, on the waterfront, and in residential neighborhoods
- Continue to partner with the MBTA to bring improvements to the Blue Line, Commuter Rail, and

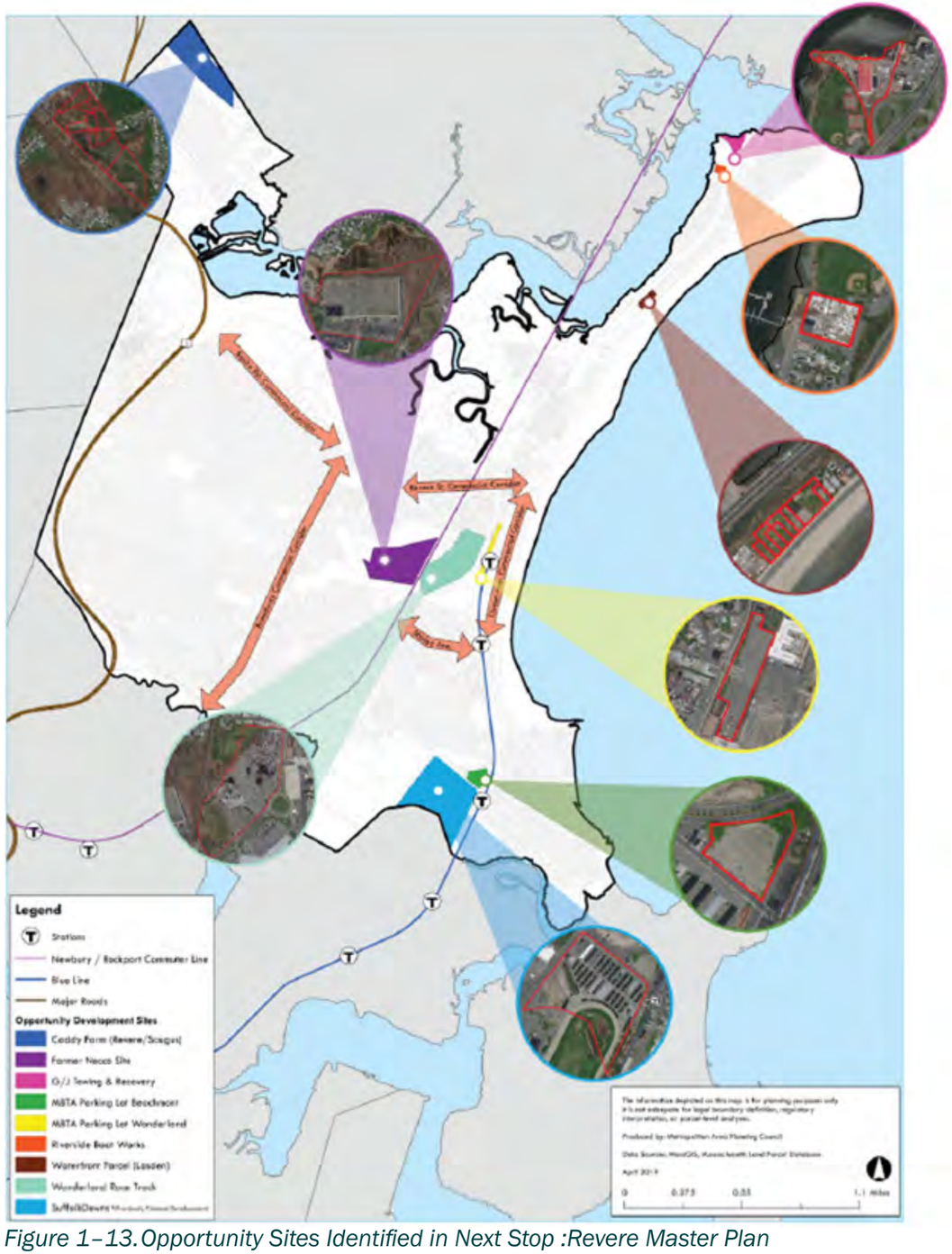


Figure 1–13. Opportunity Sites Identified in Next Stop :Revere Master Plan

local bus service

- Continue to work closely with MassDOT, DCR, and neighboring communities on highway projects on state-owned roadways in Revere
- Continue advocacy for regional transportation improvements to alleviate regional traffic congestion and minimize its local impacts

To achieve these goals, recommendations made in Next Stop: Revere include:

- Implementation of the Complete Street prioritization plan, improvements to signal timing, and adoption of a Vision Zero ordinance
- Expansion of regional off-street bicycle connections with neighboring communities, and adoption of an ordinance that requires bicycle lane striping in roadway reconstruction projects
- Parking management and shared parking / bus lanes
- Improvements on the existing transit services and advocacy for a new Commuter Rail station in Revere.

1.4.5. East Boston Municipal Harbor Plan

The East Boston Municipal Harbor Plan (EBMHP) was developed by Boston Redevelopment Authority (BRA) and approved in 2002. The municipal harbor planning process is a voluntary process that cities and towns can undertake to establish local guidelines for development and use of waterfront land that is subject to the Massachusetts Public Waterfront Act (Chapter 91). The primary objectives of the EBMHP are to provide the public with meaningful access to the waterfront, preserve and strengthen the working port, enhance the East Boston community, and ensure that the waterfront serves as a positive economic force for East Boston's and the City's economy. The basic goals, guidance and requirements of the EBMHP were developed to ensure consistency with the East Boston Master Plan, which was completed in 2000.

A two-tiered set of goals guides the EBMHP. Goals related to the water's edge includes:

- Preserve and promote water-dependent industrial uses.
- Preserve and promote other water-dependent uses where appropriate.
- Provide full and appropriate utilization of the Inner Harbor waterfront.
- Maintain and improve the quality of life and the public's enjoyment of the waterfront.
- Preserve, protect, and enhance public access to and use of the waterfront.
- Diversify water and land transportation linkages.
- Support compatible economic development consistent with Chapter 91 principles.

Additional goals:

- Promote housing to meet community needs.
- Reinforce existing commercial and business centers.
- Reconnect neighborhoods through better access and pedestrian pathways.
- Preserve, maintain, and enhance historic residential neighborhoods and natural resources.
- Address overall community access to parking

The EBMHP specifies urban design guidelines, standards for the shoreline and watersheet, specifies urban establishment of water transit nodes, and a variety of open space improvements, including expansion of the Harborwalk, additional waterfront open spaces, streetscape improvements, and other public space improvements. On the transportation side, the document reviews existing issues and proposed projects key to furthering land and transportation resources.

The EBMHP was amended in 2008 in order to address specific development proposals in the area subject to the harbor plan. In February 2022, Mayor Michelle Wu announced that the City of Boston would undertake a process to develop a new municipal harbor plan process for East Boston that will build upon the planning and recommendations of PLAN: East Boston.

1.4.6. East Boston Designated Port Area (DPA)

As part of the Massachusetts Public Waterfront Act, the Massachusetts Office of Coastal Zone Management (CZM) is responsible for administering both the public-facing, rights-of-access regulations under Chapter 91 as well as the Designated Port Area (DPA) policy (301 CMR 25). DPAs are zones adjacent to waterways that have regulatory protection in order to preserve and enhance water-dependent industrial uses, protect maritime infrastructure from redevelopment that does not require water access, and thereby preserve public maritime investments and the jobs that this infrastructure enables.

In practice, CZM must balance the overall intent of the DPA (i.e., encourage water-dependent industrial uses in low-lying areas that have historically possessed functional access to marine trade routes) with competing demands for waterfront land. At the same time, Chapter 91 regulations also protect the public's right to access the waterfront for fishing, navigation, and recreation and ensure that private uses of tidelands serve a proper public purpose.

The DPA regulations work to either maximize the use of areas already suited for water-dependent

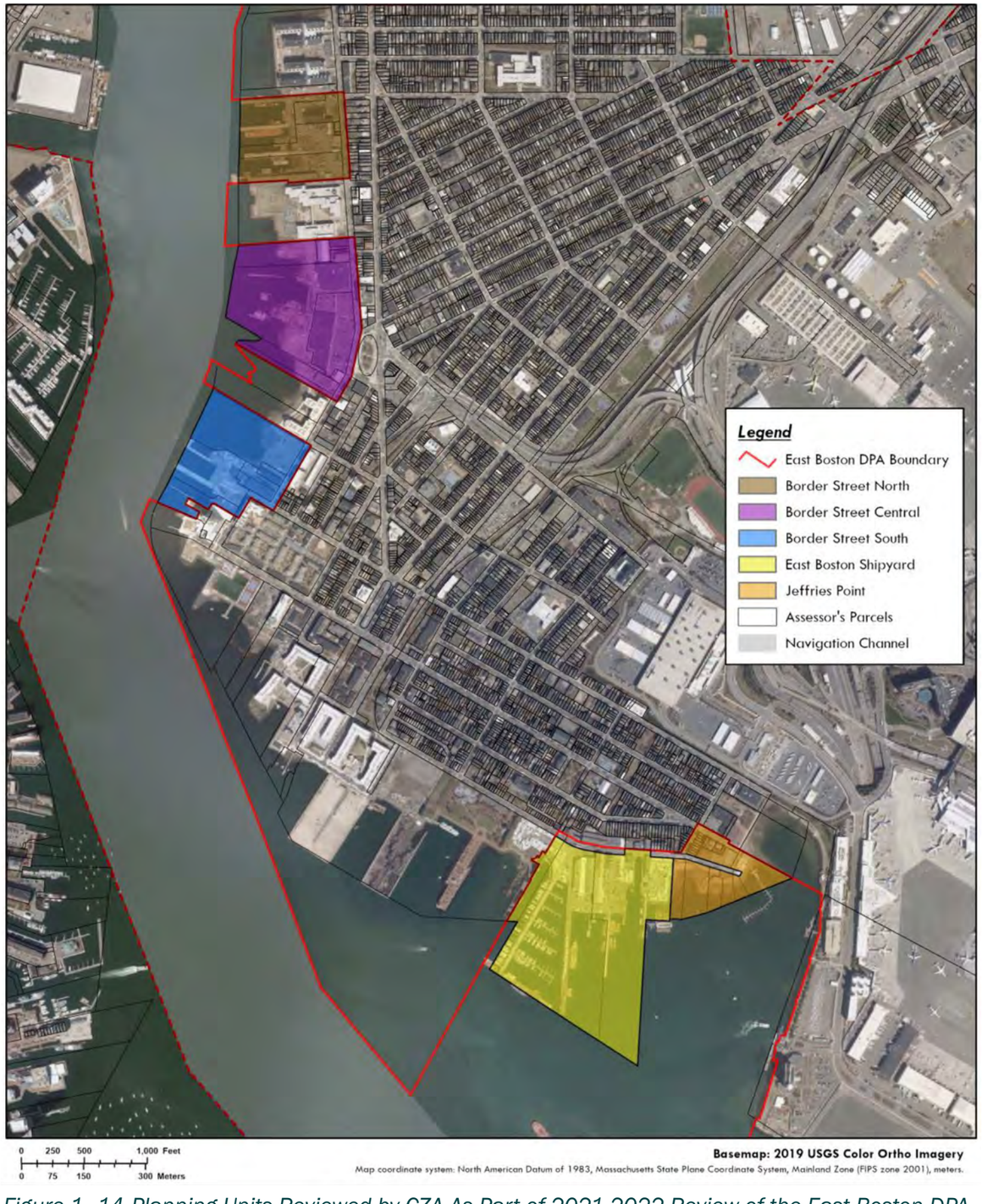


Figure 1–14. Planning Units Reviewed by CZA As Part of 2021-2022 Review of the East Boston DPA

industrial uses or avoid the loss or conversion of such areas to incompatible residential, commercial and recreational uses. Such a policy helps create a predictable regulatory and development climate in which future marine industrial uses need not require costly and environmentally damaging alterations in order to simply gain maritime access in areas where it has historically been available.

Updates

After receiving a request to review portions of the East Boston Designated Port Area from the Boston Planning & Development Agency (BPDA), CZM determined that a review of the entire DPA, including both land and water, was warranted. For the sake of this particular review, the assessment was performed using five independent planning units, as shown in Figure 1–14.

A boundary review designation report was issued on December 15, 2021. CZM found that the East Boston DPA boundary should be amended to remove the upland areas of the Jeffries Point planning unit (orange area within Figure 1–14). As noted in the determination issued on December 23, 2022, the DPA boundary for the other four planning units remained the same.

Effects

The East Boston DPA occupies a portion of the East Boston shoreline situated approximately 1.0-1.5 miles southeast of Route 1A's intersection with Curtis Street, which forms the southern end of the study corridor. The Jeffries Point planning unit that was recently removed from the East Boston DPA does not functionally interact with Route 1A or publicly-owned rail parcels that form the focus of this study.

1.4.7. Chelsea Creek Municipal Harbor Plan

The Chelsea Creek Municipal Harbor Plan and Designated Port Area (DPA) Master Plan was initiated by the City of Chelsea and the Commonwealth of Massachusetts. The plan was finished in 2020, as a long-term, comprehensive plan that sets policies and standards for guiding both public and private uses of the land and water in the planning area in a manner consistent with the community's vision and objectives. The study area of this plan comprises the Chelsea Creek waterfront within Chelsea, from the McArdle Bridge to the Mill Creek crossing of the MBTA Newburyport/Rockport Commuter Rail line at the Revere city line. The study area also encompasses the land and water portions of the Chelsea Creek DPA within Chelsea's municipal boundaries.

The Municipal Harbor Plan was built on previous public visioning processes including the 2016 initiative facilitated by MAPC, and covers a series of strategies intended to advance the policies covering eight key topics:

- Public Access: Create and maintain physical and visual public access that promotes recreation, relaxation, engagement with the waterfront, and economic development.
- Public Programming: Develop, support, and maintain public programming that creates economic and cultural opportunities for the community and expands the locations where this programming can occur along the waterfront.
- Economic Development: Encourage uses in the harbor planning area that will create living-wage, local jobs, support the local economy, and contribute to regional growth.
- City Zoning: Ensure that the city's land use regulations effectively promote the policies of this plan and align with the relevant policies of MGL Chapter 91, the Public Waterfront Act.
- Transportation: Increase opportunities for users of all modes and all abilities for improved transportation to, from, and through the Chelsea Creek waterfront while balancing the legitimate needs of both maritime and land-based users.
- Infrastructure Improvements: Ensure that waterfront infrastructure is safe and adequate to accommodate existing and anticipated uses, and ensure that infrastructure improvements address predicted sea-level rise and storm-surge scenarios based upon the best available science.
- Climate Change: Minimize economic, social, and environmental impacts of climate-change-related flooding and encourage site and infrastructure improvements that mitigate and adapt to projected flooding and sea-level rise.
- Pollution: Encourage waterfront uses in a manner consistent with all state and federal environmental regulations, promote the remediation of contaminated sites, and expand progress in realizing the promise of the Clean Water Act of swimmable and fishable waters

The Chelsea Creek Municipal Harbor Plan suggests working with MassDOT to improve the Chelsea Street Bridge and access along Eastern Avenue and Marginal Street. The intersection of these three facilities is the major gateway between Chelsea to the Route 1A study area and the primary connection of both sides of Chelsea Creek. Another suggestion was to reconfigure the intersections and roadways on both sides of the Chelsea Street Bridge to prioritize Silver Line traffic and safely accommodate pedestrians and bicyclists.

1.4.8. Chelsea Creek Designated Port Area (DPA)

As noted in Section 1.4.6 (East Boston Designated Port Area (DPA)), DPA regulations are intended to preserve maritime infrastructure, maximize the use of areas already suited for water-dependent industrial uses, and avoid the conversion of such areas to incompatible residential, commercial and recreational uses.

Updates

In March 2021, a group of private property owners requested a review of the Chelsea Creek DPA boundaries, with the aim of removing certain parcels from water-dependent DPA designation. CZM completed a thorough review of all DPA lands within the existing Chelsea Creek DPA boundaries, including all parcels, roads, rights of way, and parcels located northwest of the Route 1A roadway and bounded by the Chelsea Street bridge to the south and the municipal boundary of Boston/Revere to the north.

For the purposes of analysis, CZM divided the area within the boundary into three functional groups that were "sized and configured in a manner that allowed for consideration of relevant factors affecting overall suitability of the area to accommodate current and future water-dependent industrial use," as shown in Figure 1–15. CZM concluded that the North and South groups would remain within the Chelsea Creek DPA given their ability to meet each of the four suitability criteria.

However, CZM determined that "the presence of the railroad right of way [a portion of which is encumbered by a legacy freight easement] prevents this [Central] planning unit from having a

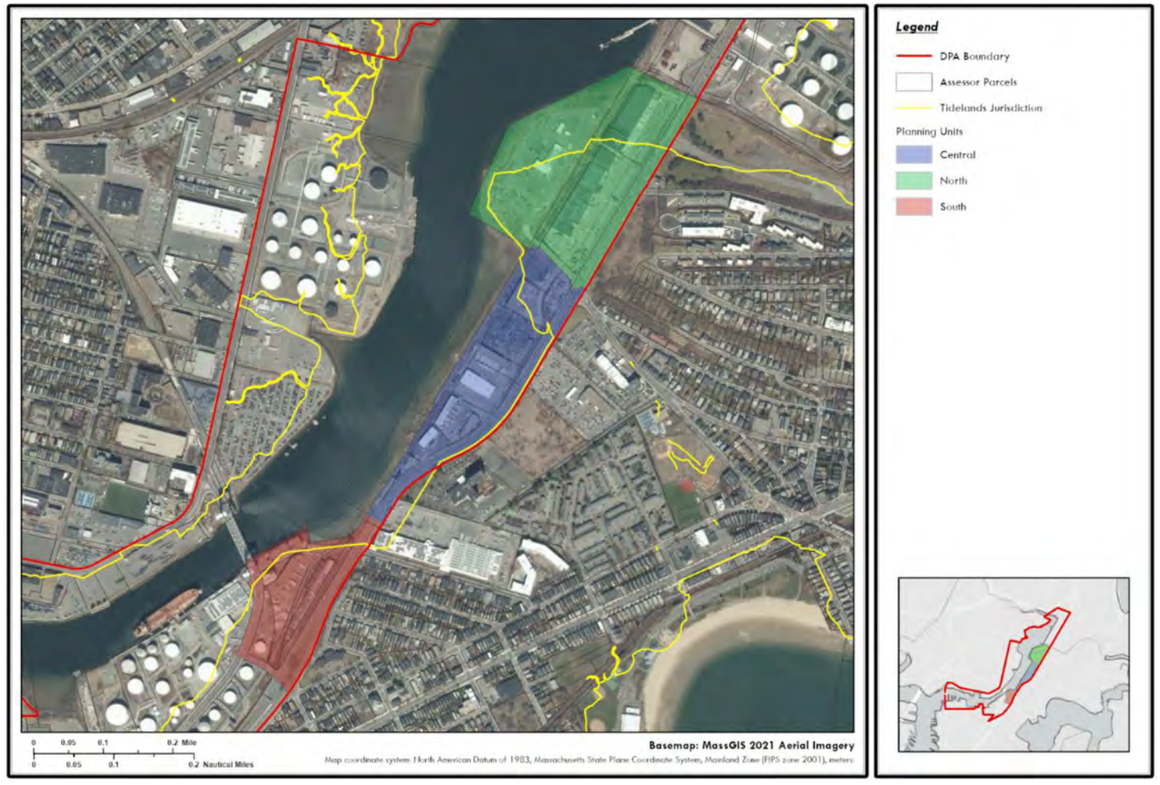


Figure 1–15. Planning Units Reviewed by CZA As Part of 2021-2022 Review of the Chelsea Creek DPA

functional connection to the water." As a result, CZM resolved to remove the Central planning unit, as well as the adjacent section of Route 1A/McClellan Highway, from the Chelsea Creek DPA (effective September 6, 2022). The amended (i.e., current) DPA boundary for Chelsea Creek, which removes the McClellan Highway parcels located west of Route 1A, south of Boardman Street and north of Addison Street, is shown in Figure 1–16.

Although this change in the Chelsea Creek DPA removes the DPA designation from the Central planning unit (approximately Addison Street to Boardman Street), the majority of the study corridor, nevertheless, continues to reside within the updated Chelsea Creek DPA boundary. This change in DPA designation loosens the land use and redevelopment restrictions on the parcels within the Central planning unit. The full study corridor nevertheless remains within Chapter 91 jurisdiction, and would be subject to Chapter 91 requirements for licensing, public access, and broader public purpose.

In addition, within the broader context of water-dependent industrial uses, the DPA regulations permit "licensable accessory and supporting commercial and industrial uses that co-occur and are compatible with" such a primary use. An "accessory use" would include elements like a parking facility, access and interior roadway, administrative office, or a marine-oriented retail facility. "Supporting uses" entail industrial or commercial uses that offer direct economic or operational support for the water-dependent industrial and must also be compatible with activities characteristic of a working waterfront and its backlands.

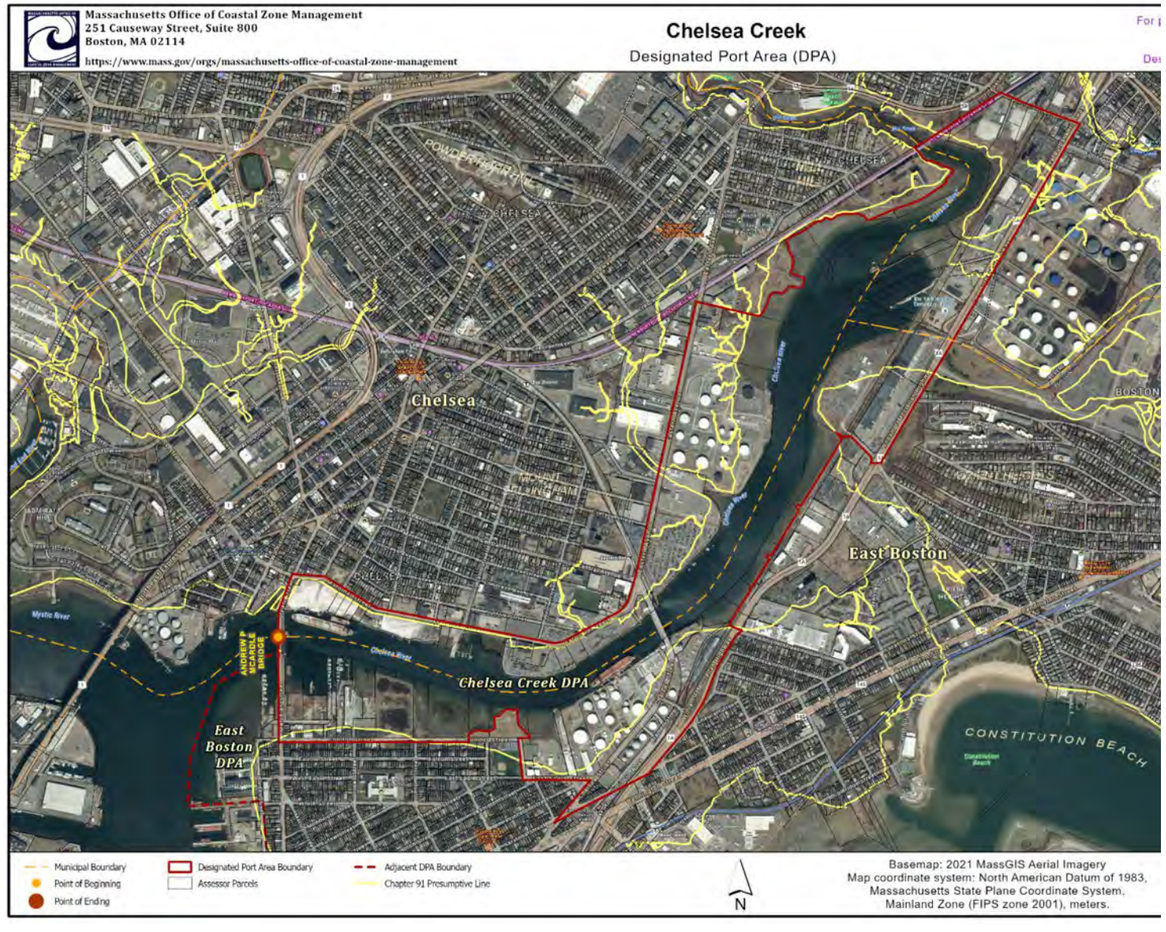


Figure 1–16. Amended Boundary of the Chelsea Creek DPA (Effective September 6, 2022)

1.4.9. Suffolk Downs Redevelopment

Suffolk Downs, a former thoroughbred horse-racing facility, is a 161-acre site in Revere and East Boston, located between the Blue Line / Bennington Street corridor to the east and industrial sites adjacent to the Route 1A study area on the western side. As shown in Figure 1–17, there are plans for major redevelopment for this site over the next 20 years. This includes a 16.2 million square foot mixed use development consisting of 10,000 housing units, an 800-key hotel, 5.2 million square feet of office and lab space, and 450,000 square feet of retail space. Parking facilities for this development will consist of 13,820 spaces, including 630 on-street spaces. Approximately 25 percent of the project site will be dedicated to open space.

This new development will have a significant impact on the local and regional transportation system, with nearly 120,000 daily trips forecast to be generated by the development in 2040. Of these, nearly 70,000 are expected to be vehicle trips. Without mitigating infrastructure improvements, this would have a detrimental impact on the study area transportation system.

In the absence of mitigation, major impacts would be experienced at:

- The Route 1A corridor
- Winthrop Avenue at Revere Beach Parkway / Harris Street
- Bell Circle

Use	Area
Residential	~ 10,150,000 GSF
Commercial	~ 5,200,000 GSF
Retail	~ 450,000 GSF
Hotel	~ 400,000 GSF
TOTAL	**~ 16,200,000 GSF**

Figure 1–17. Suffolk Downs – Proposed Land Uses (HYM)

As mitigation for these impacts, the Suffolk Downs Redevelopment has proposed implementation of a transportation trip monitoring program, a comprehensive transportation demand management (TDM) program to promote alternate modes of transportation and reduce reliance on single occupancy vehicles (including carsharing, bicycle facilities, and shuttle services), $20 million of transit improvements, and $41 million of roadway improvements (Figure 1–18).

The specific mitigation measures and multimodal transportation connections (Figure 1–19) include the following, which are to be implemented in two phases, in parallel to the development of occupiable space at Suffolk Downs.

The study assumes that each of the following mitigation measures will be in place by 2030:

- Construction of a Tomasello Drive, a new roadway connecting Route 1A with the Suffolk Downs Redevelopment, which will replace the existing Tomasello Way, and construction of a new, fully-signalized intersection of Route 1A/Tomasello Drive
- A 12-foot Shared Use Path corridor (10-foot path, 2-foot buffer) in the northbound direction along Route 1A from approximately Addison Street to the new Tomasello Drive intersection
- A new pedestrian crossing across Route 1A linking Curtis Street with Moore Street

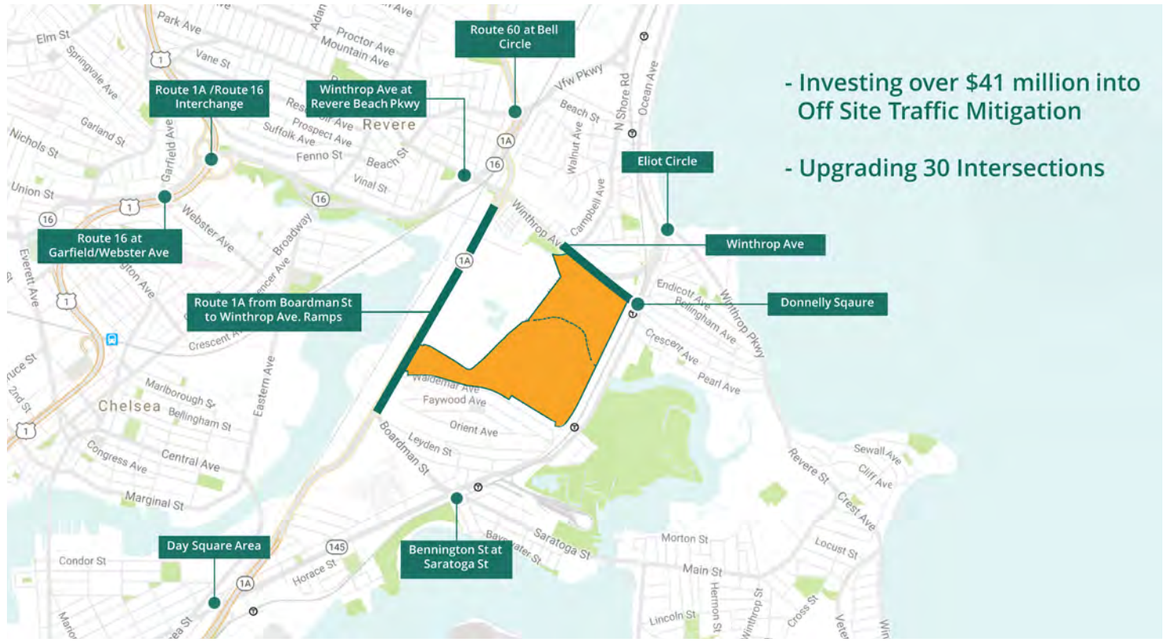


Figure 1–18.Suffolk Downs – Roadway Mitigation Map (HYM)

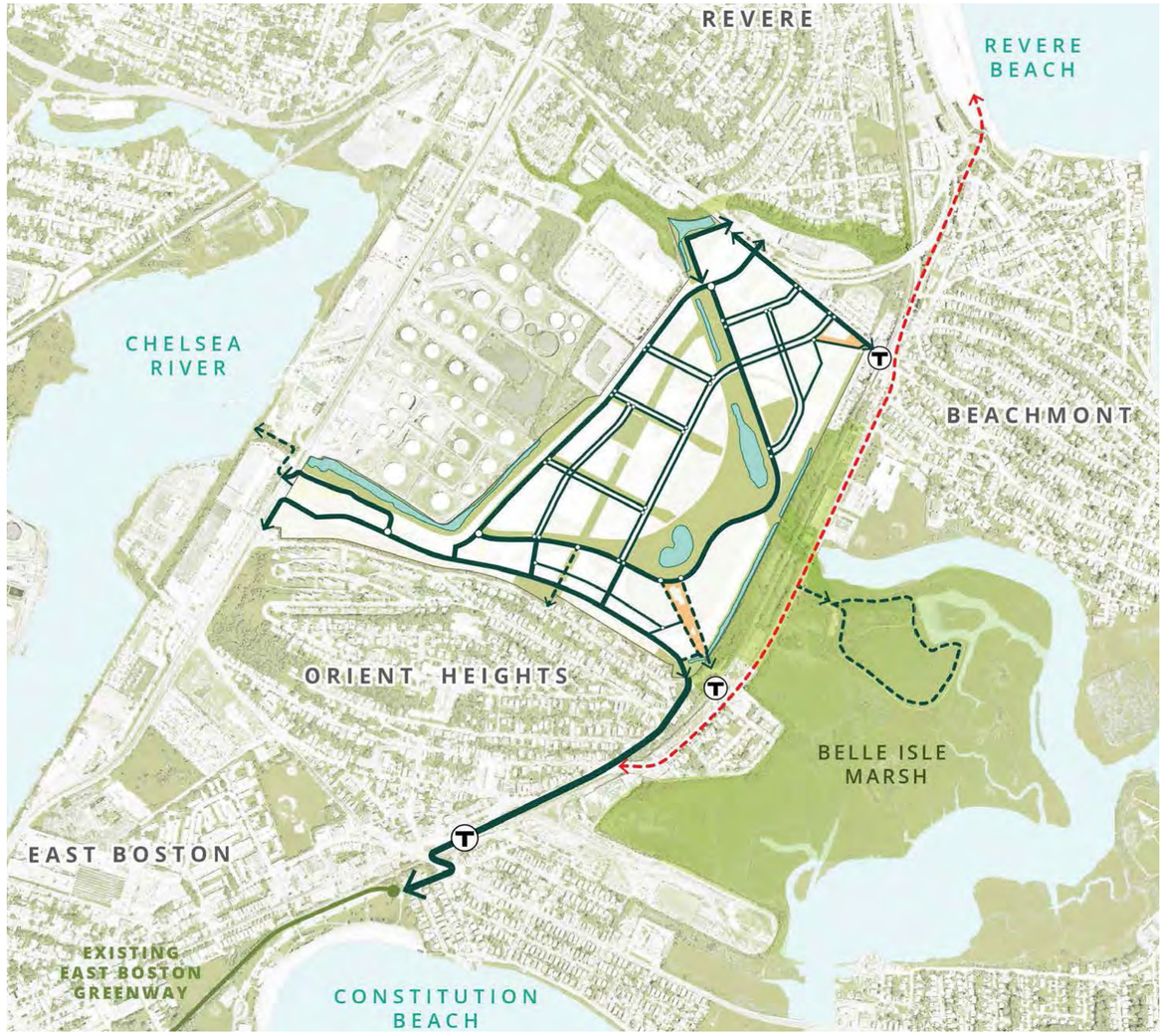


Figure 1–19.Suffolk Downs – Proposed Shared Use Path and Cycle Track Connections (HYM)

- One new northbound lane along Route 1A between Boardman Street and Winthrop Avenue
- Safety improvements at the intersection of Curtis Street and Route 1A, chiefly in the southbound direction
- Safety and access improvements at the intersections of Route 1A with Railroad Street and with Furlong Drive
- A temporary southbound left-turn lane signal at the intersection of Route 1A and Tomasello Way
- Intersection capacity improvements at Boardman Street
- Safety and access improvements at the reconfigured Winthrop Avenue at Revere Beach Parkway / Harris Street intersection
- A new U-turn lane on Harris Street[2]
- A new pedestrian signal at Harris Street[3]
- Access and safety improvements at Day Square
- Reconfiguration of Bell Circle to improve safety and access

As part of the mitigation commitments, the developer will provide a one-time operating subsidy for the Blue Line, and also contribute funding towards the planning, design, construction, or upgrade of the Blue Line assets listed below:

- Station Improvements

Figure 1–20.Suffolk Downs – Proposed Circulator Shuttle Connections (HYM)

2 As noted in the Section 61 findings regarding the mitigation's proposed Bell Circle improvements, "all movement from Everett Street will leave the corridor in a channelized lane forcing a right turn to Route 60 NB only. Vehicles will be permitted to complete a NB to SB U-turn at a new signal-controlled U-turn Lane at Harris Street."

3 As noted in the Section 61 findings regarding the mitigation's proposed Bell Circle improvements, this pedestrian "crossing location is consistent with the northerly boundary of the Rumney Marsh Academy, affording the opportunity to cross Route 60 without traveling directly to Bell Circle."

  - Suffolk Downs
  - Beachmont
- Blue Line Signal design
- Beachmont Bus Station Study

In addition, the developer has committed to offering three circulator shuttles connecting Suffolk Downs to major activity centers in Boston as well as to the Chelsea Commuter Rail station (Figure 1–20). While an intervening stop is proposed in the Seaport, the circulator shuttles, as currently proposed, would not stop along the Route 1A corridor. Two of these routes would operate along Route 1A and connect with major transit centers, with one bound for North Station (Orange Line, Green Line, Commuter Rail, Amtrak) via the Sumner / Callahan tunnels and another traveling along I-90 to serve South Station (Red Line, Silver Line, Commuter Rail, Amtrak).

1.4.10. LandLine Trail and Greenway Plan

In 2018, the Metropolitan Area Planning Council (MAPC) released the LandLine Trail and Greenway Plan, a proposal for a seamless 1,400-mile linked network of foot trails and greenways within the Boston region. Among other plans, this report proposed to fill in the gaps that currently exist between the Boston-area's numerous active transportation facilities. MACP's Landline is generally consistent with LivableStreets Alliance's Emerald Network, which envisions 200 miles of seamless greenway around Boston.

In both initiatives, the MassDOT/MBTA rail ROW parallel to Route 1A is proposed to serve as a greenway connecting existing and planned facilities. It is planned to be a multi-use greenway linking the Chelsea Greenway (via the Chelsea Street Bridge) to the planned Suffolk Downs path and trail networks (Figure 1–21). An additional connection is planned to link the East Boston Greenway / Mary Ellen Welch Greenway near Day Square to the Chelsea Street Bridge (and Chelsea Greenway) via the southern end of the rail ROW.

Figure 1–21. Planned Greenway Network in East Boston (MAPC)

1.4.11. Cargo Ventures ("Visions for the Upper Chelsea Creek Industrial District")

In April 2019, Cargo Ventures, a property owner with land holdings adjacent to the MBTA and Commonwealth-owned rail corridor, approached the MBTA's Fiscal Management and Control Board (FMCB) with a proposal to lease the inactive rail right-of-way.

Cargo Ventures proposed converting the inactive railbed into a new two-lane roadway (Figure 1–22) with a Shared Use Path (Figure 1–23) in order to provide enhanced freight access to/from Logan Airport and facilitate the redevelopment of several industrial parcels situated between Route 1A and the rail corridor near Boardman Street.

The new roadway would tie into Route 1A to the north near the jughandle just north of Tomasello Way and meet the existing Coughlin Bypass Road to the south just past Curtis Street (Figure 1–24).

The Shared Use Path would be buffered from the new roadway by vegetation or other elements and cantilevered over the edge of Chelsea Creek (Figure 1–25). The Shared Use Path would provide connections between the state-owned rail corridor and adjacent roadways, including Tomasello Way, Boardman Street, and Chelsea Street.

Figure 1–22. Cargo Ventures – Proposed Bypass Road near Curtis Street and Chelsea Street

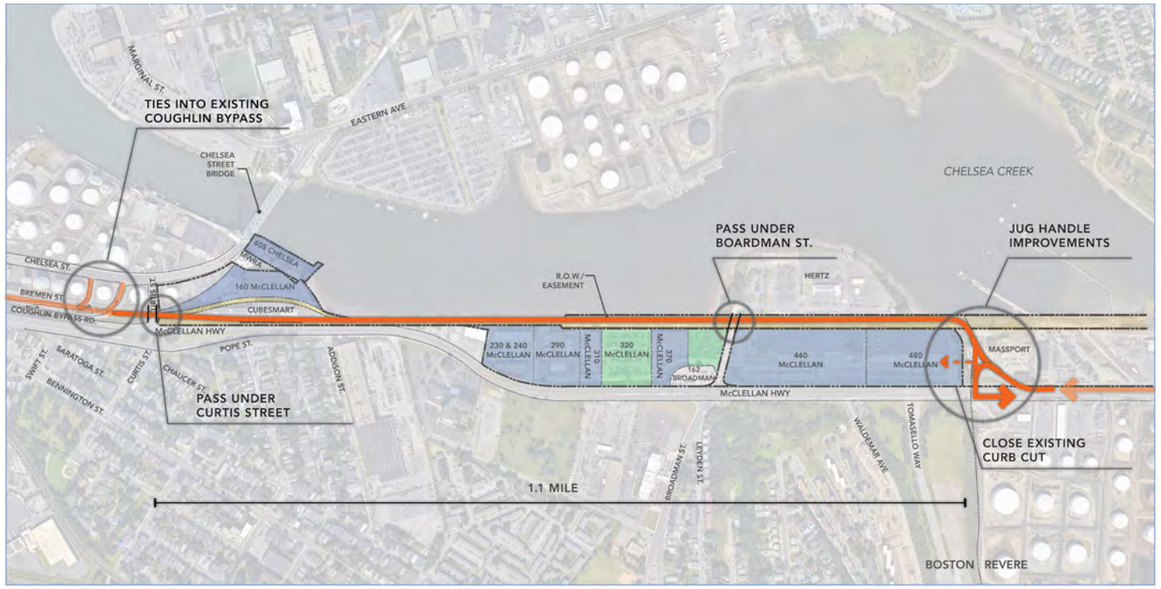


Figure 1–23. Cargo Ventures - Proposed "By-Pass" Road Extension and Commercial Vehicle Circulation

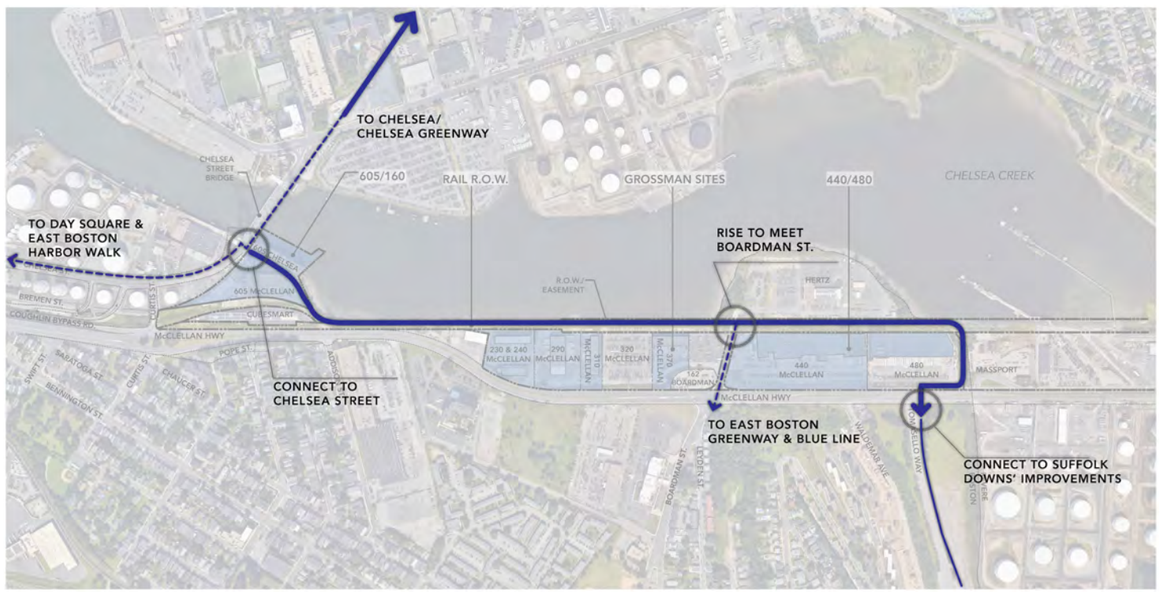


Figure 1–24. Cargo Ventures – Proposed Pedestrian and Bicycle Access Improvements

This study does NOT assume that the 2019 development proposal is implemented (i.e., a Bypass Road is not taken as a given for each alternative) but includes a version of the proposal among the alternatives that it evaluates.

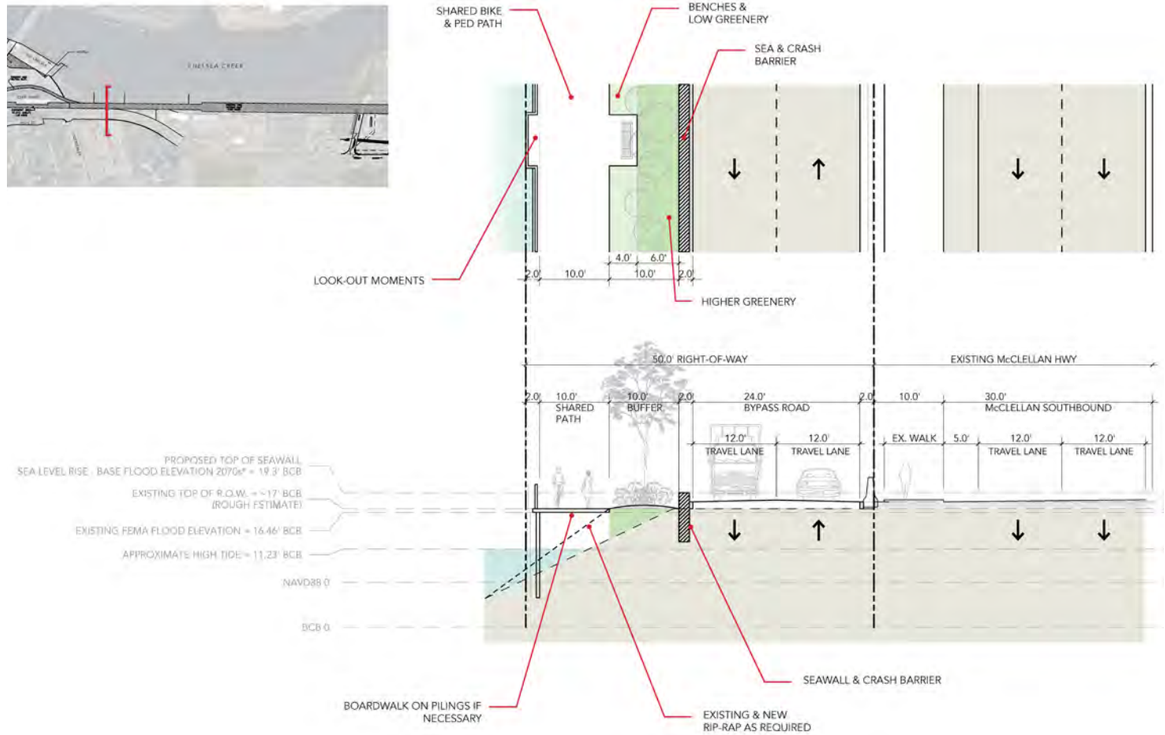


Figure 1–25. Cargo Ventures – Proposed Roadway Cross-Section

1.4.12. Transit Studies

MBTA Rail Vision

The MBTA undertook a comprehensive review of its Commuter Rail network to identify opportunities for significantly enhancing the system's transit capacity and access. After assessing a broad range of long-term infrastructure and service investment scenarios in 2020, the MBTA FMCB endorsed the study's "full transformation" alternative.

For the study area, this option includes electrified trains every 15 / 30 minutes serving a new Urban Rail station at Wonderland, as well as stations in the nearby communities of Chelsea and Lynn (Figure 1–26). Given Bell Circle's proximity to the existing MBTA Rapid Transit station at Wonderland and the presence of the below-grade Newburyport / Rockport Commuter Rail Line to the south, redevelopment of the former Wonderland dog track site and implementation of a new MBTA Commuter Rail station adjacent to Wonderland would increase the level of pedestrian activity at the northern end of the study area.

MBTA Bus Network Redesign

The MBTA's Bus Network Redesign project (BNRD) is intended as a long-term re-envisioning of the MBTA's bus network to address the ways that land use, development, demographics, and travel patterns in the MBTA service area have evolved over the years. Downtown Boston is increasingly built out, so new development is growing in other areas. Good bus service is critical for all of the MBTA service, but especially for transit-dependent Environmental Justice communities that are not well-served by the rapid transit network and rely upon buses as their primary or only transit service.

BNRD proposes increased resources for the bus system, with greater levels of service and frequency. However, BNRD also seeks to focus bus service frequency and resources where they are most needed, and to reduce or eliminate some less-productive bus routes. For the Route 1A study area, the current BNRD proposal would eliminate all bus service along Route 1A in the study corridor. Instead of continuing along Route 1A between Salem and Haymarket, Route 450 would be rerouted to run between Salem and Wonderland. For service to Downtown Boston, Route 450 riders would transfer to the Blue Line. Route 112, which currently services a local stop on Chelsea Street at Curtis Street, would be absorbed into a high-frequency service "T104" route that runs between Airport Station on the Blue Line and Malden Center, with service on the Orange Line, Haverhill Commuter Rail Line, and several other bus routes.

MassDOT Silver Line Extension (SLX) Alternatives Analysis

This on-going planning process is investigating different alignments and service frequency options to enable high quality transit connections between the Revere Beach Parkway corridor (Chelsea, Everett, Medford) and the major activity centers of Kendall Square and Downtown Boston. Six preliminary alternatives have been advanced, half of which involve extending the existing SL3 from its current Chelsea terminus to one of three existing Orange Line stations (Sullivan Square, Wellington, Malden Center) via Everett, with some service operating in bus lanes.

Three other alternatives would connect Everett to either Downtown Boston or Kendall Square by a new Silver Line service, some of which would operate in bus lanes, with intermediate stops at other rapid transit stations in Somerville, Boston, and Cambridge.

The SLX work is relevant to this study because the SL3 passes through the southern end of the study corridor before crossing the Chelsea Street Bridge. Any new service extension would provide greater connectivity to regional destinations, although the closest SL3 stop to the study area is currently across Chelsea Creek at Eastern Avenue in Chelsea. However, a new SL3 stop at Day Square in East Boston is planned and the PLAN: East Boston process has proposed a new SL3 stop near Curtis Street at Chelsea Street in East Boston.

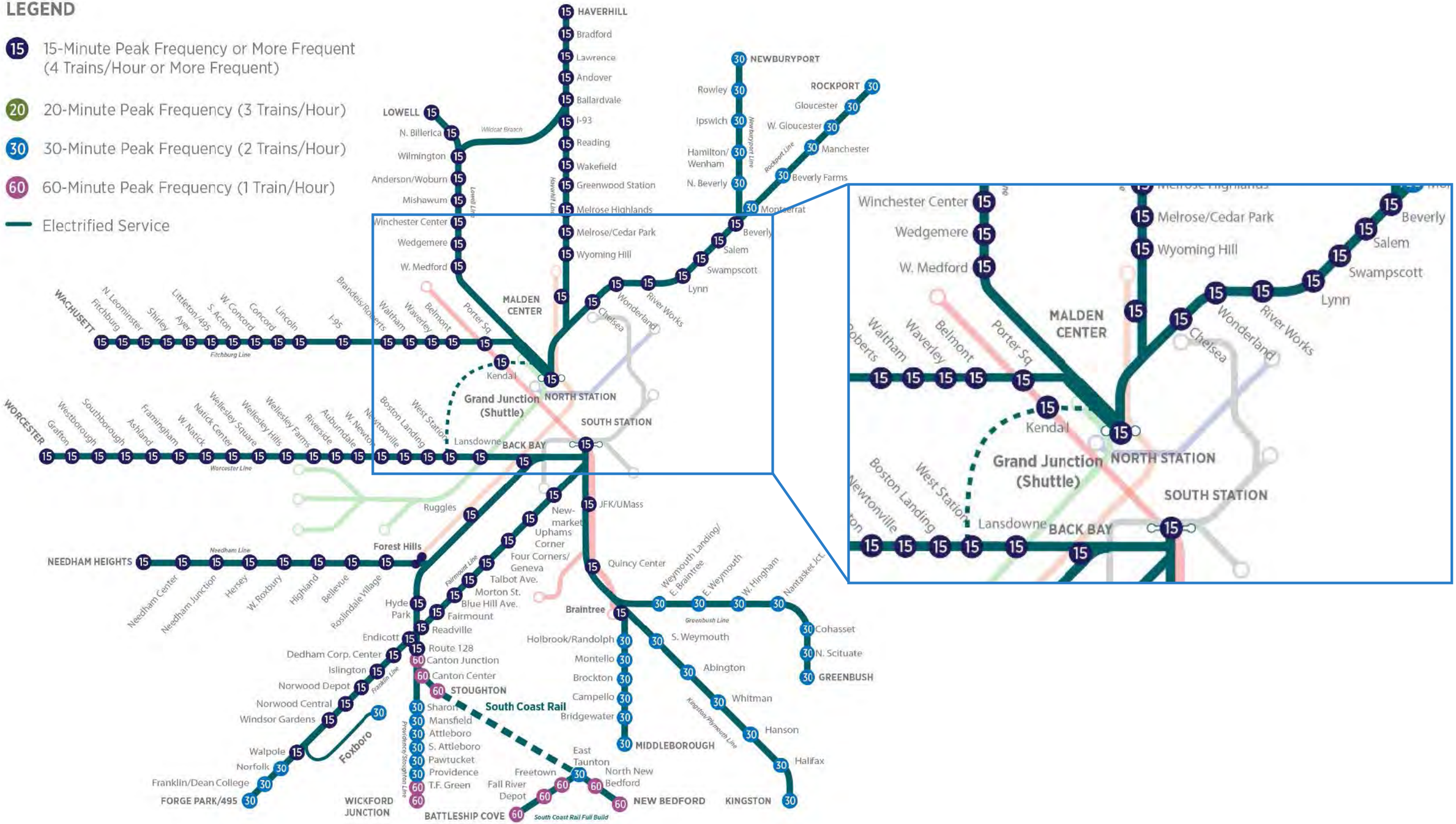


Figure 1–26. Proposed Train Frequency (MBTA Rail Vision Final Report [February 2020])

2. EXISTING & FUTURE CONDITIONS

This chapter summarizes existing demographic, land use, public health, transportation, environmental and resilience conditions along the corridor, and identifies key issues and opportunities for the transportation system as well as environmental restoration and resiliency mitigations.

2.1. INTRODUCTION

East Boston and Revere are both densely settled historic communities with Environmental Justice neighborhoods and valuable, sensitive environmental resources. These neighborhoods are also near industrial uses and major transportation facilities, including Logan International Airport, the MBTA Blue Line, and major highways like Route 1A (Figure 2–1).

Route 1A is a critical transportation corridor for the cities and towns of Massachusetts' North Shore. The segment of Route 1A included in the Route 1A study corridor is bounded by the congested Bell Circle Rotary to the north, where it connects with other regional highways (Route 16 and Route 60), and in the south by ramps to and from Saratoga Street near Day Square. In East Boston and southern Revere, Route 1A passes through industrial and commercial land uses. With its widely-spaced intersections and high-speed traffic, Route 1A represents a barrier for pedestrian and bicycle access between Chelsea Creek and the residential neighborhoods of East Boston and Revere.

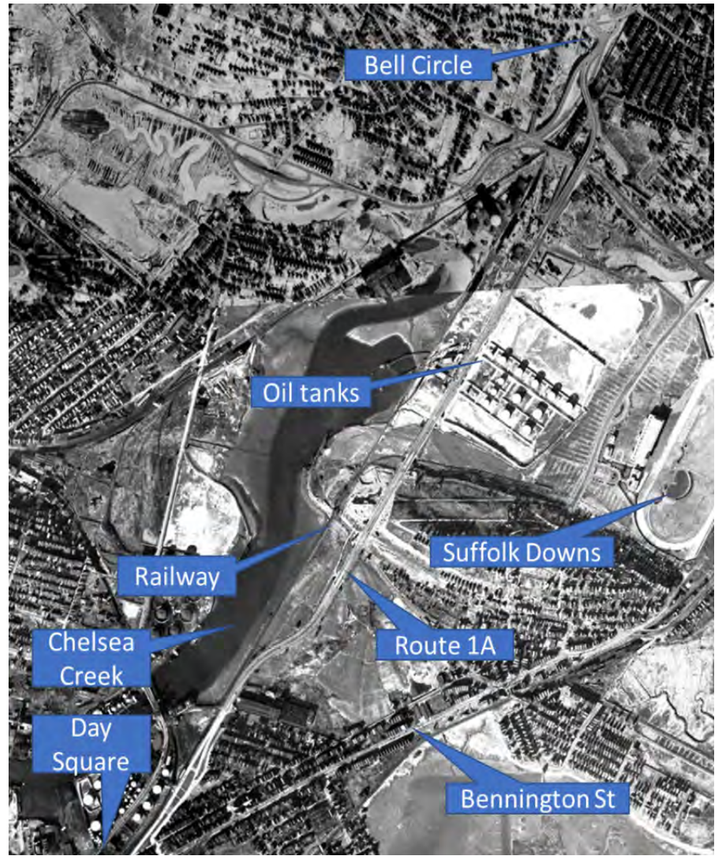


Figure 2–1. 1938 USGS Aerial Including Project Study Area (MapJunction.com)

East Boston and Revere are the site of significant development activity, due in part to their proximity to downtown Boston and accessibility of the Blue Line. These developments include the major Suffolk Downs Redevelopment as well as from smaller but significant developments like the 144 Addison Street development in East Boston. These developments will increase travel demand throughout the area, including the Route 1A study corridor. The Suffolk Downs Redevelopment

project has committed to a range of mitigation investments and community benefits, including improvements to Route 1A, the Suffolk Downs and Beachmont Blue Line stations, the East Boston Greenway, and other nearby transportation facilities.

In addition to the highway, the Route 1A study corridor also includes an abandoned rail corridor owned by MassDOT and the Massachusetts Bay Transportation Authority (MBTA); this 1.6-mile linear parcel runs along Chelsea Creek and could be repurposed for public uses that may include a bypass route for freight, transit, and other vehicles, as well as for pedestrian and bicycle transportation use, recreation, and flooding resilience.

2.2. DEMOGRAPHICS AND COMMUNITY CHARACTER

The neighborhoods in and around the study area include vulnerable communities of concern, with significant immigrant, low-income, and limited English proficiency populations. People in these neighborhoods generally have worse health outcomes on average than other regional populations. Population within the study area is projected to grow, including growth in established neighborhoods and in newly-developed or redeveloped areas.

2.2.1. Population

Figure 2–2 shows population change from 2014 to 2019 at the Census Block Group level. Population in neighborhoods near the Route 1A corridor grew during this time period, including significant increases throughout East Boston, Revere and Chelsea. These communities have historically had rents and home prices that are generally more affordable than other neighborhoods relative to their proximity to downtown Boston and good transportation access, in particular the Blue Line. However, substantial economic development near the study corridor has generated concerns among residents of gentrification and potential displacement.

Future projected population change from 2020 to 2040 is shown in Figure 2–3. The airport hotel/car rental area and Suffolk Downs area are projected to have slight population losses (less than 5 percent), while most TAZs in the study area along Route 1A corridor are projected to grow between 5 percent and 20 percent over the next 20 years.

Figure 2–2. Population Change from 2014 to 2019

Figure 2–3. Projected Population Change from 2020 to 2040

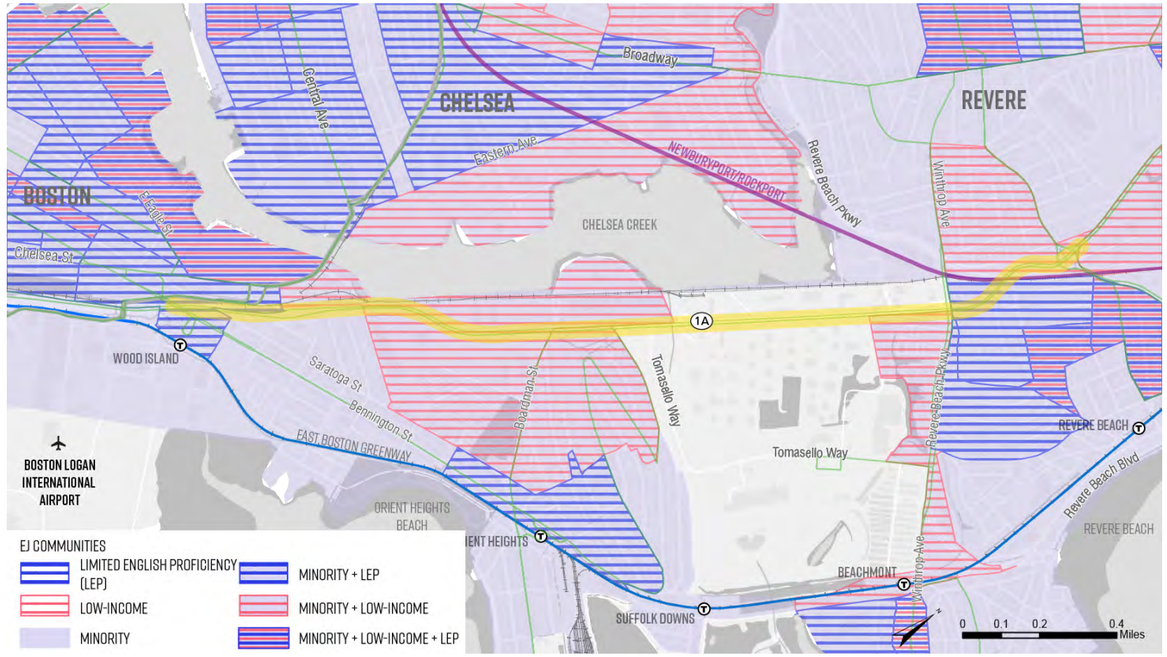


Figure 2–4. Environmental Justice Communities in the Study Area

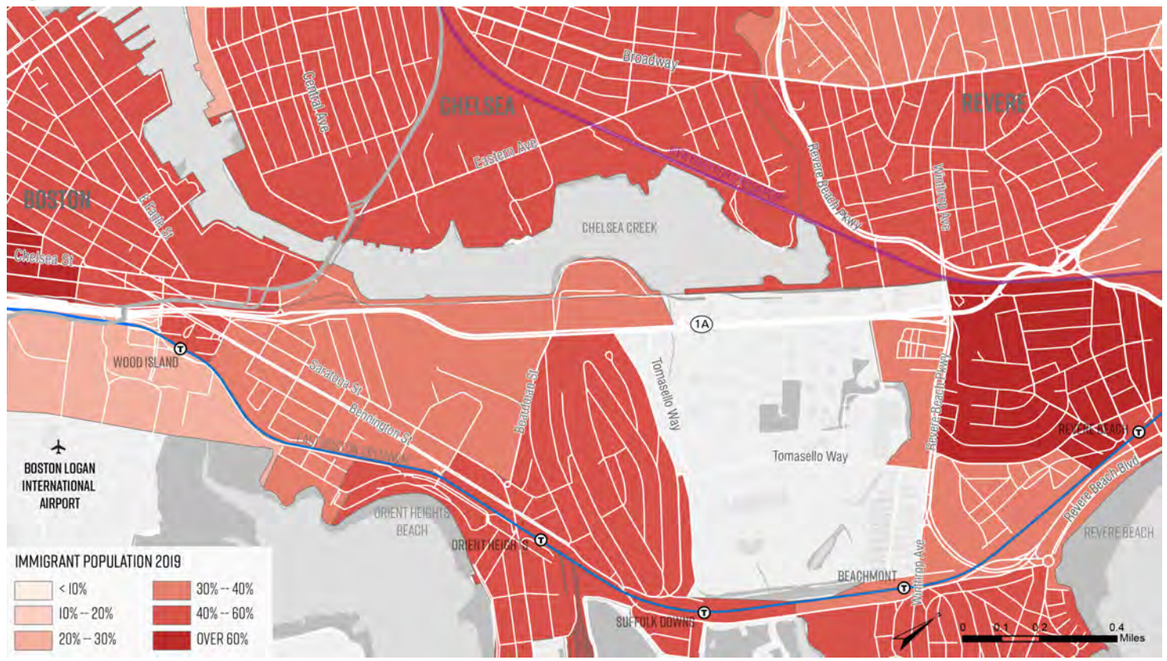


Figure 2–5. Percentage of Foreign-Born Population along the Study Corridor

2.2.2. Environmental Justice (EJ)

Figure 2–4 shows US Census tracts in the study area and its surrounding geography. All of these meet one or more of MAPC's EJ criteria, which are:

1. Non-white residents comprise more than 40 percent of population
2. Median income less than 65 percent of statewide median income; and
3. Over 25 percent of households have Limited English Proficiency (LEP)

Essentially every neighborhood in the broader study area satisfies the minority criterion, at a rate much higher than the regional average. Most of the communities also satisfy the income and / or LEP criteria, which is also higher than the regional average.

2.2.3. Immigration Status

Figure 2–5 displays the percentage of foreign-born residents within each Census Tract in 2019. Many neighborhoods have a high proportion of foreign-born residents. These neighborhoods near the Route 1A corridor have historically been immigrant gateway neighborhoods, and have continued to be so, with new immigrant populations replacing previous ones.

2.2.4. Corridor Land Uses

Existing

Figure 2–6 shows the existing land uses along the study corridor. Parcels directly adjacent to the study corridor are commercial, industrial, airport-related, and very auto-oriented. Aside from the heavy industrial presence along Route 1A and the rail corridor, land uses within East Boston, Revere, and Chelsea are predominantly residential, with commercial establishments located along main street corridors. This area has been historically shaped by the presence of industrial uses, many of which stem from their proximity to either Chelsea Creek / the DPA or Logan Airport.

Located just the south of the study area, Logan Airport significantly influences land uses, travel patterns, and quality of life within the study area. Logan Airport generates significant travel demand among employees and air travelers, as well as other impacts associated with the high demand for goods and services that come with air travelers (e.g., rental car facilities and hotels), supporting services (plants that pack in-flight meals), and aviation-borne freight shipping (Amazon and other shipping warehouses). As evidenced by the significant number of fuel tanks located near the corridor (i.e., on the east side of the corridor just north of Tomasello Way, along Chelsea Street north of Day Square, and across the Chelsea Creek in Chelsea), this

area serves as one of New England's largest bases for the transloading, storage, and distribution of fuels.

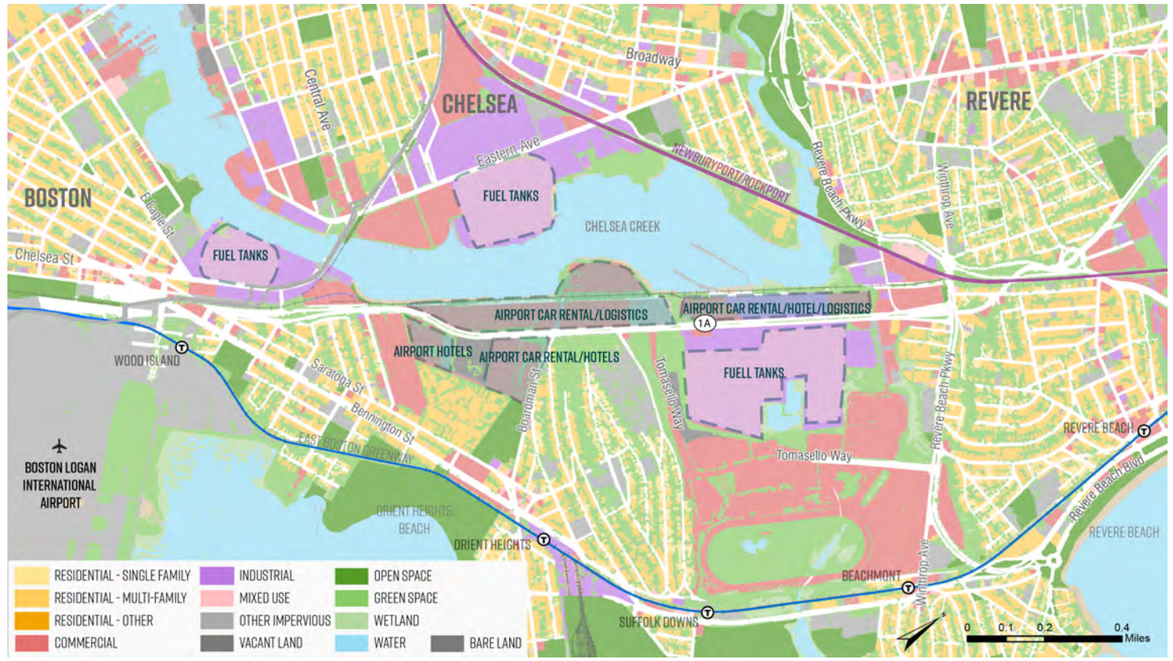


Figure 2–6. Existing Land Use in the Study Area

Future Developments

Supported by three Economic Development Areas (EDAs) that the City of Boston has created in East Boston, there is ample development activity adjacent to the study area (Figure 2–7 and Figure 2–8). The City of Boston recently created the McClellan Highway EDA, a zoning overlay district that aims to increase mixed-use development along both sides of Route 1A from Addison Street to the jughandle, which refers to the signalized turn lane sited north of Tomasello Way that offers access to the Irving Oil site located at 41 McClellan Highway, as well as Revere's southernmost gas station, for vehicles traveling southbound along Route 1A. It includes a portion of the rail-adjacent parcels between Route 1A and Chelsea Creek.

As shown in Figure 2–7, there are several liquid fuel facilities in and around the study corridor. Given the global transition away from fossil fuels to low-carbon energy resources, there may be opportunity for long-term land use changes for these fuel tank properties. This transition is demonstrated by the recent proposal for redevelopment of the Global Oil fuel tank site in Revere. Under this proposal, 29 above-ground fuel storage tanks would be removed and remediated, then replaced with a roughly 670,000 square foot freight logistics center.

The proposed land use change at the Global Oil site shows that despite the potential for transitioning fossil fuel-related uses, the demand for freight and industrial uses persists in the study corridor. The proximity of Logan International Airport and the established presence of existing freight and industrial facilities suggest that a transition to mixed-use development along Route 1A and between Route 1A and Chelsea Creek is still uncertain.

Figure 2–7. Economic Development Areas, Liquid Fuel, and Airport-Related Parcels in the Study Area

Figure 2–8. Future Development Projects in the Study Area

2.2.5. Public Health

Publicly-available public health data was reviewed and evaluated for the study area relative to other municipalities and other neighborhoods in Boston. The public health evaluation was constrained by the availability of data. There is statewide data available for pediatric asthma by municipality and for pediatric diabetes by county; more finely-grained data is available for Boston, with several public health metrics available by neighborhood. According to several indicators (asthma, diabetes, heart disease) populations located in the study area corridor appear to suffer from poorer health than other populations in the region.

Pediatric Asthma

Figure 2–9 shows Massachusetts pediatric asthma rate by municipality in 2016 to 2017. The rate of childhood incidence in Boston, in which the majority of the study area lies, is nearly 40 percent higher than statewide (16.8 percent compared to 12.1 percent). Revere, which contains a smaller portion of the study area, has a relatively lower rate (8.5 percent), as do two other immediate adjacent communities – Winthrop (9.4 percent) and Chelsea (10.5 percent).

Figure 2–10 shows Boston City area Asthma Emergency Department visits among 3- to 5-year-olds in 2012 to 2015, at the neighborhood level. Given East Boston residents' proximity to Logan Airport, highways, and industrial land uses, the low rate of pediatric asthma hospital admissions for East Boston children is unexpected. Since this is an indirect measure – emergency department visits – rather than a direct measure of disease incidence, it is possible that there is a lack of healthcare access for East Boston residents.

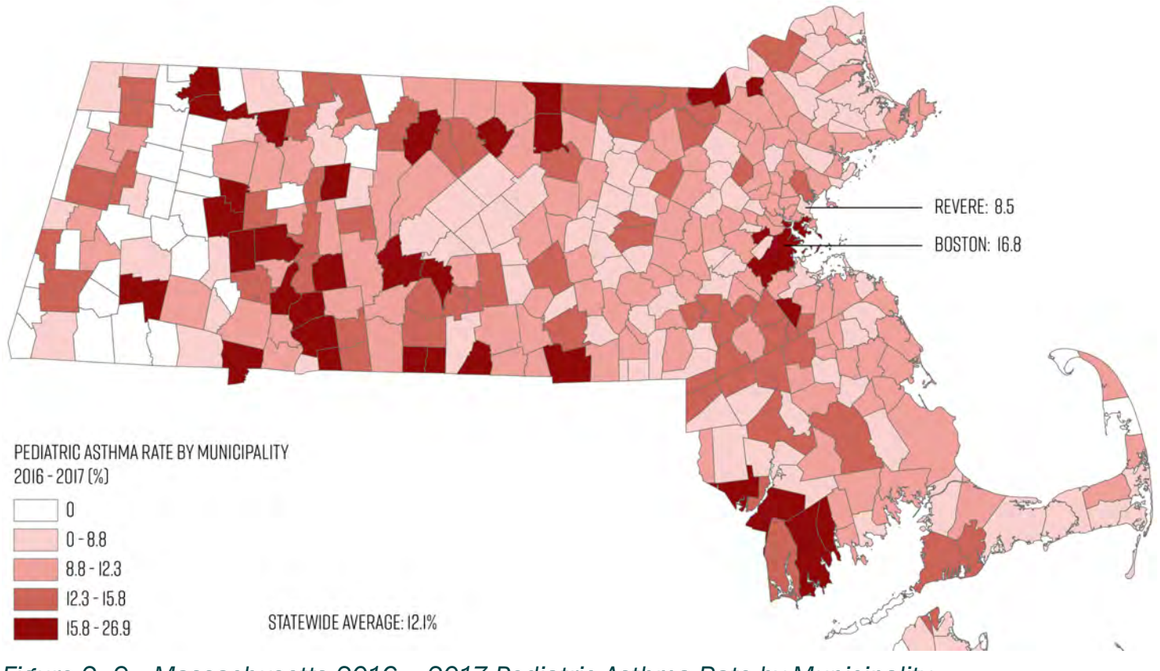


Figure 2–9. Massachusetts 2016 – 2017 Pediatric Asthma Rate by Municipality

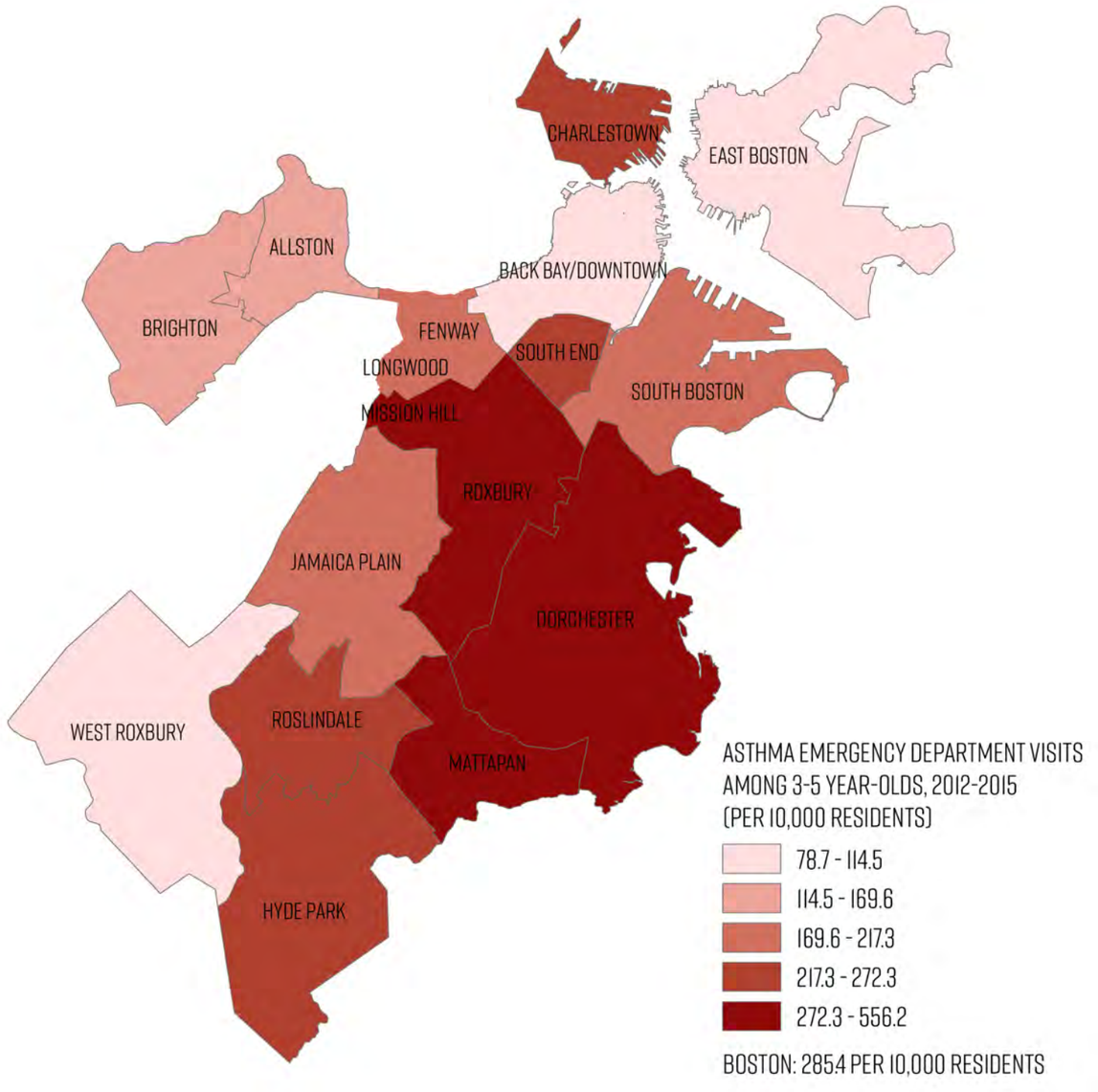


Figure 2–10. Boston 2012 – 2015 Asthma Emergency Department Visits Among 3- to 5-Year-Olds by Neighborhood

Diabetes Among Children and Adults

Table 2–1 displays Massachusetts pediatric diabetes (Type I and Type II) rates by county in 2016 and 2017. For Suffolk County, the location of Boston and Revere, the rate of Type II pediatric diabetes is more than double that of the statewide average (23.8 compared to 10.45 per 100,000 students). Although there are many potential causes of Type II diabetes, physical inactivity and obesity are key contributing factors.

Table 2–2 shows neighborhood-level public health outcomes for adult residents in neighborhoods throughout Boston. For East Boston, the rate of adult diabetes is slightly higher than the citywide (9.0 percent compared to 8.0 percent), while the rate of heart disease is significantly higher than statewide average (109.8 compared to 86.5 per 10,000 residents).

Table 2–2. Adult Diabetes and Heart Disease Rates by Neighborhood (City of Boston, 2010, 2013, and 2015 Combined)

NEIGHBORHOOD	*ADULTS DIABETES (%)*	*HEART DISEASE ((PER 10,000 RESIDENTS)*
Allston	3.7	75.5
Brighton	3.7	75.5
Back Bay	3.8	66.5
Charlestown	3.9	88.2
Dorchester (02121, 02125)	12.8	97.5
Dorchester (02122, 02124)	9.3	95
East Boston	9.0	109.8
Fenway	3.9	63.7
Hyde Park	9.0	96.7
Jamaica Plain	5.8	67
Mattapan	17.3	100
Roslindale	8.0	81.4
Roxbury	14.1	117.3
South Boston	5.8	94.1
South End	6.5	86.9
West Roxbury	7.9	72.7
Boston	**8**	**86.5**

Table 2–1. Pediatric Diabetes Rates in Massachusetts by County (Commonwealth of Massachusetts)

GEOGRAPHY	*YEAR*	*TYPE 1 (PER 1,000 STUDENTS)*	*TYPE 2 (PER 100,000 STUDENTS)*
Barnstable	2016-2017	2.7	6
Berkshire	2016-2017	3.2	18.1
Bristol	2016-2017	2.7	13.6
Dukes	2016-2017	0.6	0
Essex	2016-2017	2.3	12
Franklin	2016-2017	3.6	0
Hampden	2016-2017	2.3	9.7
Hampshire	2016-2017	2.2	8.4
Middlesex	2016-2017	2.3	10.9
Nantucket	2016-2017	2.4	0
Norfolk	2016-2017	2.2	2.7
Plymouth	2016-2017	2.3	1.8
Suffolk	2016-2017	1.6	23.8
Worcester	2016-2017	2.5	10.2
Statewide		**2.33**	**10.45**

2.2.6. Demographics and Community Character Issues and Opportunities

- Study area communities predominantly made up of Environmental Justice populations
  - Non-white residents > 40% of population
  - Median income < 65% of statewide median income
  - Limited English proficiency > 25% of households
  - High foreign-born population, including half of East Boston residents
- Land use and environmental challenges
  - Fuel tanks, shipping, rental car facilities, hotels line corridor due to the proximity to Logan Airport
  - Historic and continuing industrial uses of Chelsea Creek, Designated Port Area
- Public health challenges for neighborhoods near the corridor
  - High rates of diabetes and heart disease in East Boston
  - High rate of pediatric asthma in Boston, low pediatric asthma hospital admissions in East Boston (potential issue of healthcare access)

2.3. TRANSPORTATION CONDITIONS

2.3.1. Corridor Configuration

The primary study corridor is composed of two major components -- the MBTA / MassDOT-owned rail corridor and the Route 1A roadway corridor – and spans from Bell Circle in the north to Curtis Street in the south (Figure 2–11). The central focus of this study is the potential for re-use of the rail corridor, which was the subject of a 2019 lease proposal from Cargo Ventures. This study considers potential uses of the rail corridor beginning south of Winthrop Avenue at Railroad Street in Revere, the site of a former roadway bridge over the abandoned rail spur. Since the property beyond that point is constrained by narrow width and an inability to connect to the adjacent street network, the study does not consider re-use of the corridor north of Railroad Street.

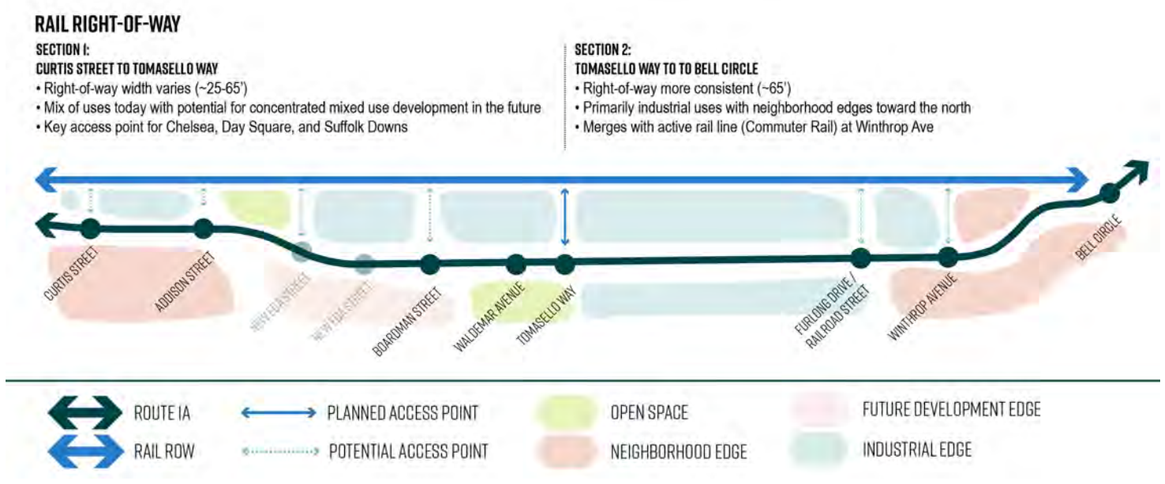


Figure 2–11. Study Corridor Existing Conditions (Route 1A from Curtis Street to Bell Circle)

Rail Corridor

In general, the linear rail corridor widens as one moves from south to north, with the northern end offering more width and flexibility for design of potential future uses. Widths vary considerably, ranging from an absolute minimum of approximately 27 feet near Addison Street to a maximum of nearly 85 feet near the Boston – Revere municipal Line. Typical widths between Addison Street and Boardman Street offer approximately 42 feet while the section from Boardman Street to Tomasello Way is approximately 65 feet. Key pinch points include the area between Curtis Street and Addison Street (27 feet) and a short segment in Revere that narrows to 47 feet wide near the Hampton Inn and Furlong Drive.

As noted in Chapter 1 and discussed further in Section 2.4.2 (Resilience), several alternative uses of this rail right-of-way have been proposed by local governments, regional entities, private developers, and non-profit advocacy groups. Each of the proposals focuses on re-purposing the railbed to become one or more of the following elements:

- Shared Use Path Connection for Walking and Biking
- Passive Linear Park/Recreational Space/Permeable Surface
- Road-Based Freight Movements or Other Transportation Access
- Climate Resilience Measures

For transportation uses, new connections to the rail corridor from existing public right-of-way would be necessary. Active industrial uses between the rail corridor and Route 1A limit access from the public right-of-way to both the rail parcels and the shoreline of Chelsea Creek (Figure 2–12), requiring access via existing public streets and public pedestrian ways. The railroad corridor is depressed below grade at several of the public roadways, such as Curtis Street and Boardman Street, which would require a change in grade to make the connection at those locations. This area is also anticipated to become increasingly vulnerable to flooding from future sea level rise and storm surges; the depressed elevation of the railroad corridor could create a flooding infiltration pathway.

Figure 2–12. Potential Access Points to/from New Development Areas

Route 1A Roadway

Initial segments of the Route 1A alignment were built in the 1930s; these were connected to a one-mile long elevated Route 1A viaduct that was completed in 1951. This elevated segment of Route 1A, known as the East Boston Expressway, connected the Sumner Tunnel (and later the Callahan Tunnel) with Logan Airport and points north. It comes to grade near the Curtis Street ramps and its name changes to the William F. McClellan Highway, roughly where the study area begins. Route 1A continues as a limited-access highway to the northeast, with a mix of junction types: widely spaced signalized intersections; high-speed, unsignalized right-in/right-out only intersections; and a set of ramps with an overpass at Winthrop Avenue/Route 145.

Route 1A carries heavy volumes of automobile and truck traffic. There is sidewalk coverage along both sides of the highway, but sidewalks are relatively narrow and close to high-speed traffic, while some segments of sidewalk are in poor condition. Pedestrian crossings are spaced relatively far apart, and the crossings are fairly wide. The corridor's design and condition have contributed to significant vehicular and pedestrian safety concerns; MassDOT crash data indicates there have been four fatal crashes in the study corridor in the last five years, including a pedestrian fatality in 2020.

The Route 1A study corridor terminates at Bell Circle, a complex hybrid rotary with the Route 1A highway running through the middle of it. Route 16/Mystic Valley Parkway, Route 60/American Legion Highway, and Beach Street all terminate at Bell Circle, while Route 1A turns east toward Revere Beach and the North Shore. In addition to being highly congested, Bell Circle is also one of MassDOT's high crash pedestrian intersections.[1] Pedestrian and bicycle access through Bell Circle can be challenging, with a pedestrian crossing through the middle and sidewalks along Route 1A that terminate at medians without crosswalk connections across adjacent highway lanes.

2.3.2. Safety in All Modes

Figure 2–13 illustrates motor vehicle crashes in 2016 to 2020 along the corridor, weighted by severity of injury.[2] There is a significant crash cluster at the southern end of the corridor, with four fatal crashes including three fatalities in the immediate vicinity of the Curtis Street intersection. There are also non-fatal crashes clustered at Bell Circle as well as the middle segment of the corridor near the rental car parking lots.

The map also shows 95th percentile vehicle speeds (the speed of the vehicle that is traveling faster than 95 percent of the other vehicles, and slower than the fastest five percent) along both directions of Route 1A. The higher vehicle speeds in the south segment of the corridor correlate with higher crash incidence and severity. The four fatal crashes are also located in the southern segment of the corridor, in the higher-speed segment.

Details of the four fatal crashes are shown in Table 2–3. All four fatal crashes happened during nighttime, which suggests that light conditions may be a contributing factor to the crashes. One of the fatal crashes happened in rainy weather.

Of all the crashes along the corridor between 2016 and 2020, five involved people walking and

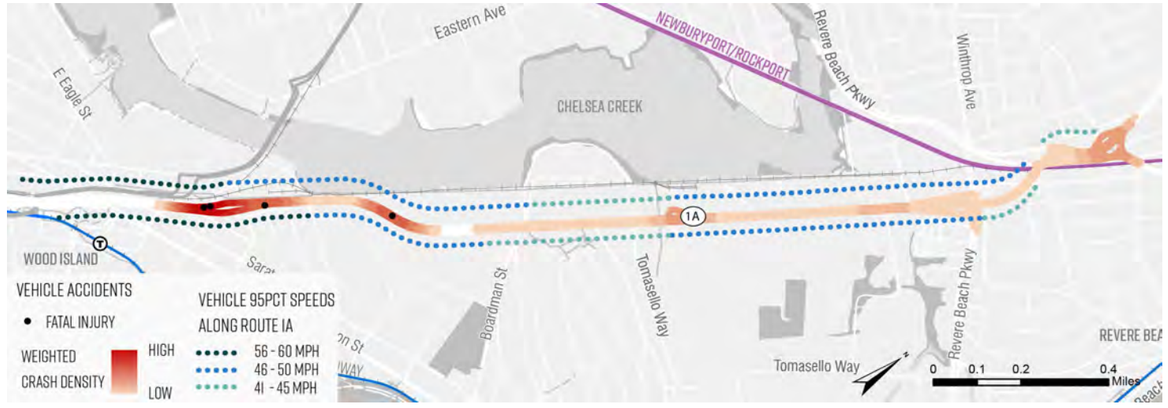


Figure 2–13. Weighted Vehicle Crash Density Along Route 1A Corridor

Table 2–3. Fatal Crashes along Route 1A from 2016-2020 (MassDOT)

CRASH NUMBER	DATE	TIME	FATAL INJURY	NUMBER OF VEHICLE	TYPE	WEATHER/ ROAD SURFACE
4717298	4/24/2019	2:01 AM	1	1	Collision with pedestrian	Rain/Water
4494416	8/21/2016	2:00 AM	1	2	Collision with pedestrian/ Other	Clear/Dry
4533186	9/28/2016	1:27 AM	1	1	Collision with bridge overhead structure	Clear/Dry
4533191	11/28/2016	10:59 PM	1	1	Collision with curb	Clear/Dry

1 https://gis.massdot.state.ma.us/topcrashlocations/
2 Weight based on FHWA Safety Toolkit: Fatality =541.7, Injury = 11.2, Property only = 1.0 https://safety.fhwa.dot.gov/local_rural/training/fhwasa14072/sec4.cfm

three involved people riding bikes. Four of the pedestrian-involved crashes and one bicycle-involved crash occurred between Tomasello Way and Curtis Street; one pedestrian-involved crash and one bicycle-involved crash occurred near Bell Circle; and one bicycle-involved crash occurred near the entrance to the shopping center south of Winthrop Avenue. These locations along the study corridor are closest to residential neighborhoods and areas with pedestrian access.

Given the relatively small number of crashes and the various conditions in which pedestrian- and bicycle-involved crashes occurred, there are no other clear trends the data show. Details of these crashes are shown in Table 2–4. The majority (five out of eight) crashes involving a person walking or biking resulted in an injury and one of the crashes was fatal.

Table 2–4. Bicycle and Pedestrian Crashes along Route 1A from 2016-2020 (MassDOT, Boston Vision Zero)

LOCATION	DATE	TIME	INJURY SEVERITY	TYPE	WEATHER/ ROAD SURFACE
Route 1A at Waldemar Ave	12/27/2017	2:38 AM	Injury	Collision with pedestrian	Unknown
Route 1A and Furlong Dr	4/3/2019	5:32 PM	No Apparent Injury	Collision with cyclist	Clear
Route 1A and Curtis St	4/24/2019	2:01 AM	Fatal	Collision with pedestrian	Rain/Water
Route 1A between Addison and Boardman Streets	5/17/2019	3:02 PM	Injury	Collision with cyclist	Unknown
Route 1A between Addison and Boardman Streets	7/10/2019	7:26 PM	Injury	Collision with pedestrian	Unknown
Beach St and John Mooney Rd (Bell Circle)	7/13/2019	11:48 AM	Unknown	Collision with cyclist	Clear
Route 1A and Boardman Street	10/3/2019	5:02 AM	Injury	Collision with pedestrian	Unknown
Route 1A northbound north of Bell Circle	10/31/2019	7:42 PM	Serious Injury	Collision with pedestrian/ Collision with motorist	Cloudy/Wet

2.3.3. Traffic and Vehicular Access

Regional Traffic Patterns

In order to better understand regional travel patterns for users of the corridor, origin-destination data from StreetLight Analytics was examined for daily trips traveling along the segment of Route 1A between Tomasello Way and the jughandle / U-turn intersection. The findings are visually summarized on the next page in Figure 2–14 through Figure 2–17, and tabulated within Table 2–5 and Table 2–6.

As shown on the left side of the next page, the greatest sources of user origins (Figure 2–14) / destinations (Figure 2–15) for the trips beginning or ending north of the study corridor are the communities of Revere and Lynn, with lesser traffic volumes coming from the municipalities along the Route 1 corridor. Most travelers use Route 60, Revere Beach Parkway, and the VFW Parkway / Lynnway / Route 1A to access or exit the study corridor; substantial traffic merges / splits at the junction of Route 60, Salem Turnpike, and Route 1A.

As shown on the right side of the next page, the greatest source of user origins (Figure 2–16) / destinations (Figure 2–17) for the trips beginning or ending south of the study corridor is Logan Airport. Substantial other origins / destinations are in the Seaport area/South Boston and downtown Boston. Lesser destination / origins are the East Boston residential neighborhood, Winthrop, and Chelsea. Not surprisingly, the most heavily trafficked roadways south of the study corridor are the Ted Williams Tunnel (I-90) and the Sumner Tunnel (Route 1A).

Table 2–5. Top Flows to/from Areas North of Jughandle

LOCATION	ORIGIN SHARE (SOUTHBOUND)	DESTINATION SHARE (NORTHBOUND)
US-1 North	17%	18%
Salem Turnpike	12%	12%
Squire Rd Rotary	29%	38%
Veterans of Foreign Wars Parkway	22%	21%
Winthrop Avenue Ramps – Revere Beach Parkway / MA-16	10%	6%
Winthrop Avenue Ramps – Ocean Ave / MA-145	10%	12%
Winthrop Avenue Ramps – Other Local Distribution	N/A	5%

Table 2–6. Top Flows to/from Areas South of Jughandle

LOCATION	ORIGIN SHARE (SOUTHBOUND)	DESTINATION SHARE (NORTHBOUND)
Sumner / Callahan Tunnels (Downtown)	15%	17%
Ted Williams Tunnel (I-90 / Seaport)	24%	17%
Airport Roads	21%	24%
Curtis Street – Chelsea	N/A	10%
Curtis Street – East Boston	N/A	10%
Local – Boardman Street (Revere / Northern East Boston)	12%	7%
Local – Chaucer Street (Southern East Boston)	12%	N/A
Other Local Distribution	16%	15%

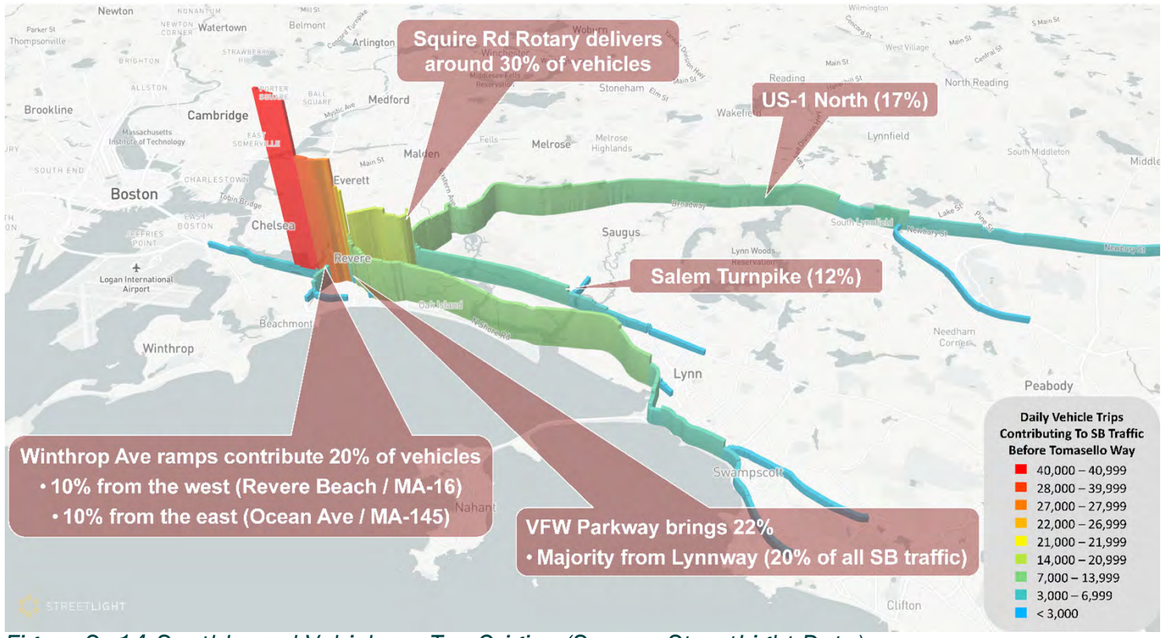


Figure 2–14. Southbound Vehicles – Top Origins (Source: StreetLight Data)

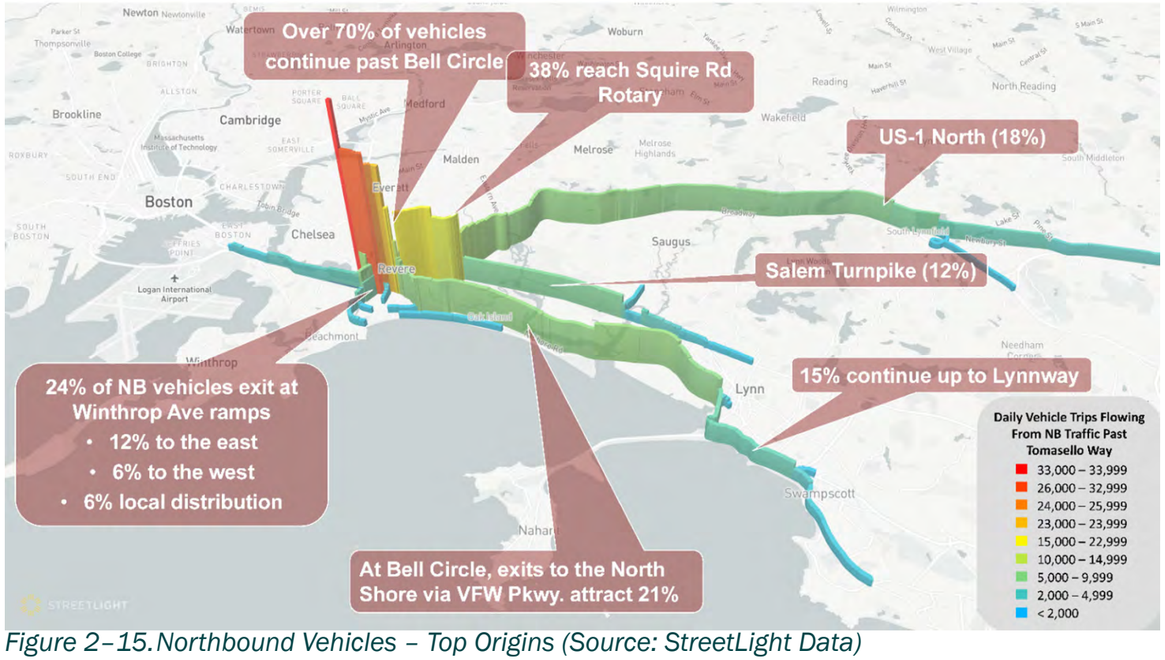


Figure 2–15. Northbound Vehicles – Top Origins (Source: StreetLight Data)

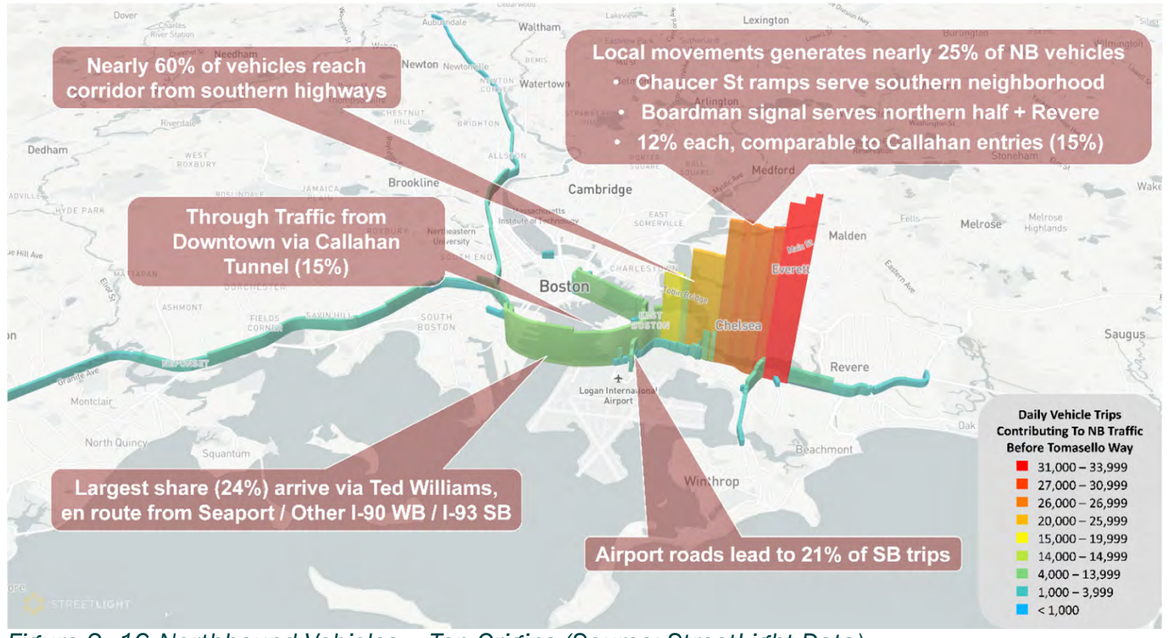


Figure 2–16. Northbound Vehicles – Top Origins (Source: StreetLight Data)

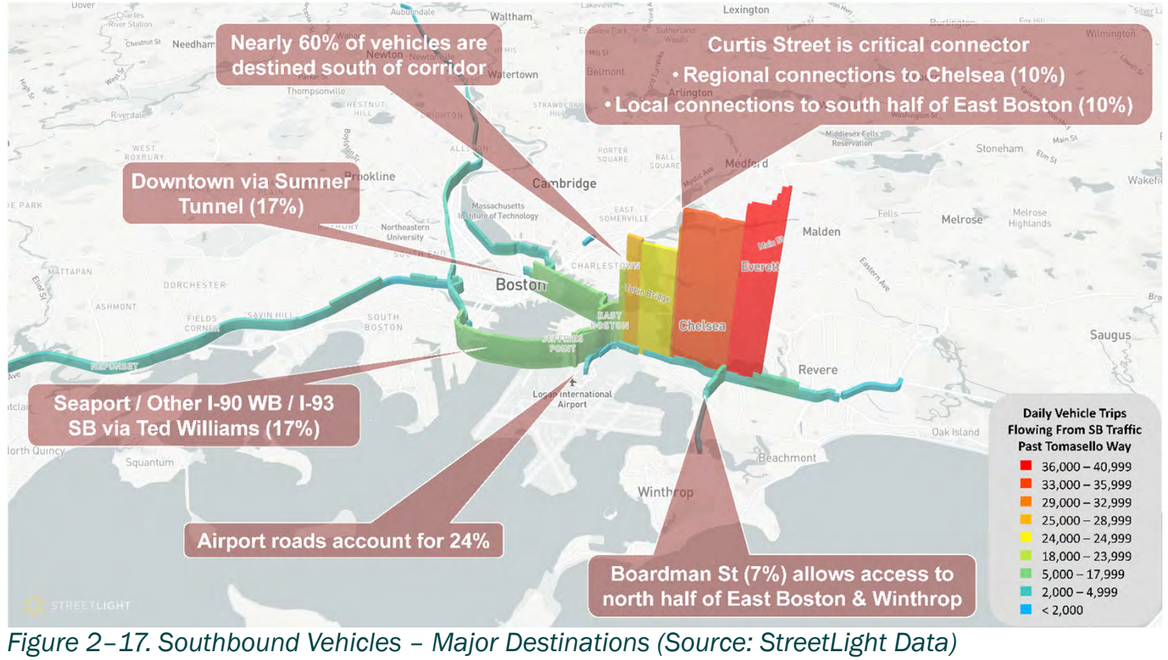


Figure 2–17. Southbound Vehicles – Major Destinations (Source: StreetLight Data)

Speed Data

Based on the StreetLight observations, speeds along the study corridor are highest near the uncontrolled viaduct segment of the corridor south of Curtis Street, and slowest near controlled intersections. Northbound speeds are highest south of Curtis Street (36 miles per hour (mph)), farthest from traffic signals, and slowest south of Bell Circle (15 mph). Southbound speeds are highest south of Curtis Street (34 mph), located beyond the last traffic signal, and slowest just north of the signal at Boardman Street (15 mph).

Regional Truck Patterns

In addition to evaluating the origins and destinations of overall traffic patterns, truck volumes, percentages, and origin – destination data was also collected from the following sources:

- 2017 Suffolk Downs traffic counts
- 2019 MassPort Data provided to the BPDA
- 2022 Trident Logistics (Global Oil site) proposed redevelopment traffic counts
- Streetlight Origin – Destination Data, including most likely origins and destinations for trucks traveling along the Martin A. Coughlin Bypass Road, Boardman Street, and northbound and southbound Route 1A just north of Boardman Street

The most recent data has been used to the degree possible. The 2022 count data reveals that daily truck volumes on Route 1A at the jughandle are 1,860 northbound trucks and 1,800 southbound trucks per day. Peak hour truck flows are approximately 140 trucks per hour northbound and 150 trucks per hour southbound (both occur from 11:00 AM – noon). Over the course of the day, trucks represent 6.2 percent of all daily traffic on Route 1A.

Future truck volume projections for 2040 were developed using volumes presented in the Suffolk Downs Build Condition, with the assumption that the existing conditions truck percentages would remain constant going forward. Current year peak hour percentages (i.e., K-factors) were applied to the future truck volumes to calculate peak hour truck volumes.

The 2022 and 2040 peak hour and daily truck volumes are summarized in Table 2–7. Nearly 3,700 trucks per day currently travel along Route 1A, representing just over six percent of the total vehicle volume along Route 1A (approximately 59,000 daily vehicles). Future 2040 volumes are estimated at nearly 5,000 trucks per day out of approximately 84,000 vehicles.

In addition, truck-specific origin – destination data were retrieved via Streetlight data. The following tables summarize the share of destinations for southbound 1A trucks at Boardman Street (Table 2–8) or the origins of northbound 1A trucks traveling just north of Boardman Street (Table 2–9).

Table 2–7. Existing & Future Truck Volumes

	AM PEAK	PM PEAK	DAILY
2022 NB	141	97	1,862
2022 SB	151	100	1,800
2040 NB	153	121	2,415
2040 SB	96	102	2,567

Putting aside sites which lie beyond the tunnel connections further south, the primary destination for southbound trucks and the primary origin for northbound trucks traveling on Route 1A is

Table 2–8. Top Destinations for Southbound Route 1A Trucks at Boardman Street

DESTINATION	AM PEAK	PM PEAK	DAILY
Airport	32.4%	24.1%	19.3%
Fuel Tanks / Eagle Square	5.4%	8.2%	9.1%
Rental Car / Trans Way	22.6%	8.1%	8.0%
Study Area	4.3%	7.0%	5.5%
Eastern Avenue Chelsea	0.9%	6.2%	2.8%
Other East Boston NW of Route 1A	7.4%	8.5%	5.2%
Everett Industrial	0.9%	1.9%	1.2%
Other Chelsea SE of Revere Beach Parkway	1.4%	2.4%	1.7%
Williams / Sumner Tunnels	24.8%	33.6%	47.2%

Table 2–9. Top Origins of Northbound Route 1A Trucks at Boardman Street

DESTINATION	AM PEAK	PM PEAK	DAILY
Airport	10.6%	17.7%	13.6%
Fuel Tanks / Eagle Square	7.0%	2.2%	7.2%
Rental Car / Trans Way	1.4%	1.1%	0.8%
Study Area	4.7%	13.7%	7.7%
Eastern Avenue Chelsea	1.4%	0.6%	1.0%
Other East Boston NW of Route 1A	4.1%	5.0%	4.1%
Everett Industrial	0.9%	0.4%	0.9%
Other Chelsea SE of Revere Beach Parkway	1.3%	0.7%	1.2%
Williams / Callahan Tunnels	68.7%	58.6%	63.4%

Logan Airport. The airport being the top destination aligns well with the land uses observed not only within the Route 1A study area, but also with other airport-oriented distribution facilities located in Revere, Chelsea, and Lynn whose travel path to and from the airport would include Route 1A.

Future Traffic Volumes

Future conditions traffic volumes analyzed as part of the Suffolk Downs Redevelopment were developed through that project's collaboration with the Central Transportation Planning Staff (CTPS). The Massachusetts Statewide Travel Demand Model (TDM), developed by CTPS in 2016, was used to forecast transit ridership, highway intersection volumes, and mode shares for the Suffolk Down FEIR. The travel demand model TDM is a spatially-oriented planning tool used to estimate future travel behavior based upon a defined set of assumptions concerning land use and demographics, the transportation network, and socio-economic data. Four different scenarios were modeled:

- Existing Conditions Model
  - TDM calibrated using the most recent highway counts and transit boardings along with data from the 2011 Massachusetts Household Travel Survey and includes highway projects and transit route changes completed by 2016
  - Land use was based on 2016 household and employment estimates along with consideration of the 2020 regional control totals from the Massachusetts Department of Transportation (MassDOT) and the University of Massachusetts (UMass) Donahue Institute
- 2040 No-Build Condition
  - Land use assumptions are from the Boston Region MPO's 2040 Long Range Transportation Plan (LRTP)
  - The highway and transit network includes all projects reflected in the Boston Region MPO's LRTP list of committed projects, which is available on the MPO's website, https://www.ctps.org/data/pdf/plans/LRTP/destination/Destination-2040-LRTP.pdf
- 2040 Build Condition (No Mitigation)
  - Land use assumptions as approved by the Suffolk Downs working group including:
    - 5,200 commercial parking spaces and 7,793 residential parking spaces
    - Parking cost of $15.00
  - Transit assumptions including:
    - Bus route changes in the Massachusetts Transportation Authority's (MBTA) Better Bus Project for Routes 111,120, 411, 424, 428, 441, 442, 448, 449, 455, 459
    - Free on-site circulation shuttle service from 6:00 AM to 8:00 PM with a 9-minute headway
    - Blue Line peak headway of 4.5 minutes
- 2040 Build Condition with Improvement Conditions
  - Assumes same land use as 2040 Build (No Mitigation) condition above, with the additional proposed highway and transit mitigations outlined below

As previously discussed, the Route 1A Corridor Study assumes the implementation of the Suffolk Downs Redevelopment mitigation measures, including the corridor roadway improvements. Therefore, the Suffolk Downs Redevelopment "2040 Build Condition with Improvement Conditions" scenario forms the basis for the roadway conditions and traffic that are assumed to be 2040 No-Build Condition for this Route 1A Corridor Study.

The model scenarios included the project's proposed roadway improvements as well as proposed bus route changes, the project's proposed on-site circulation shuttle, increased parking cost, as well as the significant trip generation impacts of the redevelopment itself. Extensive details of the model development process, model features, model inputs, and trip outputs by model are included in a Technical Memorandum included in Appendix D of the

FEIR.[1] Table 2–10 compares existing peak hour traffic counts along Route 1A (in 2017) with volumes projected to occur in 2040 under the Build Condition with Improvements scenario at select locations within the study area.

Table 2–10. Sample Existing / Future Volume Comparison

ORIGIN	EXISTING AM	2040 AM	% CHANGE	EXISTING PM	2040 PM	% CHANGE
S of Curtis St (SB)	2,690	3,110	16%	1,725	2,115	23%
S of Curtis St (NB)	1,245	1,805	45%	2,425	2,825	16%
S of Tomasello Way (SB)	2,075	2,570	24%	1,605	2,455	53%
S of Tomasello Way (NB)	1,205	1,695	41%	2,240	2,755	23%
N of Furlong Dr (SB)	1,935	1,905	-2%	1,760	2,570	46%
N of Furlong Dr (NB)	1,170	2,505	114%	2,015	3,140	56%
S of Bell Circle (SB)	1,340	1,650	23%	1,265	2,305	82%
S of Bell Circle (NB)	985	1,740	77%	1,460	1,730	18%
Curtis St (EB)	435	485	11%	395	425	8%
Boardman St (WB)	575	640	11%	395	485	23%
Tomasello Way (WB)	215	940	337%	10	910	9,000%
Winthrop Ave Ramp (SB)	235	450	91%	180	405	125%

Notes: 1) 2040 volumes are based on the 2040 Build with Improvements Conditions from the Suffolk Downs FEIR
2) AM and PM refer to AM and PM peak hours, respectively
3) Volumes transposed from Chapter 6 and Appendix B of the Suffolk Downs Redevelopment FEIR

The table illustrates that Route 1A traffic volumes are projected to increase significantly in both the northbound and southbound directions at most of the selected locations within the study area through 2040. The Suffolk Downs Redevelopment and CTPS documentation explain in detail that much of this is growth is driven by the trips generated by Suffolk Downs; page 6-20 of Volume I of the FEIR states that average AM peak period growth through 2040 was projected to be approximately 15 percent and the projected PM peak period growth through 2040 was projected to be approximately 9 percent.

In addition to increased traffic volumes on Route 1A, the Suffolk Downs development is also projected to increase traffic volumes on streets and roadways that interface with Route 1A. For example, the Winthrop Avenue southbound on-ramp becomes an access route for traffic bound for the Suffolk Downs development, with traffic roughly doubling during peak periods. An even larger effect is seen for Tomasello Way; this minor access road, with an unsignalized, limited access connection to Route 1A, becomes "Tomasello Drive" – a realigned roadway with a signalized, full-access intersection at Route 1A. This roadway will provide the primary connection between the development and Route 1A, and its traffic volumes are projected to increase.

Suffolk Downs Mitigation Commitments

The Suffolk Downs development project will implement a program of transportation mitigation measures, including a new Shared Use Path along a portion of the Route 1A corridor south of Tomasello Way. As noted in Section 1.4.9 (Suffolk Downs Redevelopment), roadway and traffic signal improvements along or adjacent to the Route 1A corridor include the following:

- Phase 1 (prior to occupancy of 1,420,000 square feet (SF))
  - New pedestrian crossing across Route 1A linking Curtis Street with Moore Street
  - Temporary southbound left-turn signal at Tomasello Way
  - Safety and access improvements at the intersections of Route 1A with Railroad Street and with Furlong Drive
  - Safety and access improvements at the reconfigured Winthrop Avenue at Revere Beach Parkway / Harris Street intersection
  - New pedestrian signal of Route 60 at Harris Street north of Bell Circle
- Phase 2 (prior to occupancy of 3,000,000 SF)
  - One new northbound lane along Route 1A between Boardman Street and Winthrop Avenue
  - Safety improvements at the intersection of Curtis Street and Route 1A, chiefly in the southbound direction
  - Road and intersection capacity improvements at the intersection of "Tomasello Drive" and Route 1A
  - Intersection capacity improvements at Boardman Street
  - A new U-turn lane on Harris Street
  - Reconfiguration of Bell Circle to improve safety and access
- Phase 3 (Prior to Occupancy of 5,500,000 SF)
  - Access and safety improvements at Day Square

1 https://www.suffolkdownsredevelopment.com/project-documents/ See PDF page 53 of Appendix D.

Corridor Traffic Operations

Level of Service is a measure of the delay or congestion drivers typically experience during a given time period, such as the morning or evening rush hours. Figure 2–18 and Figure 2–19 display current conditions at intersections along the study corridor. Not surprisingly, many key intersections – Curtis Street, Boardman Street, Tomasello Way, and Revere Beach Parkway all currently operate at the most congested level of service, F.

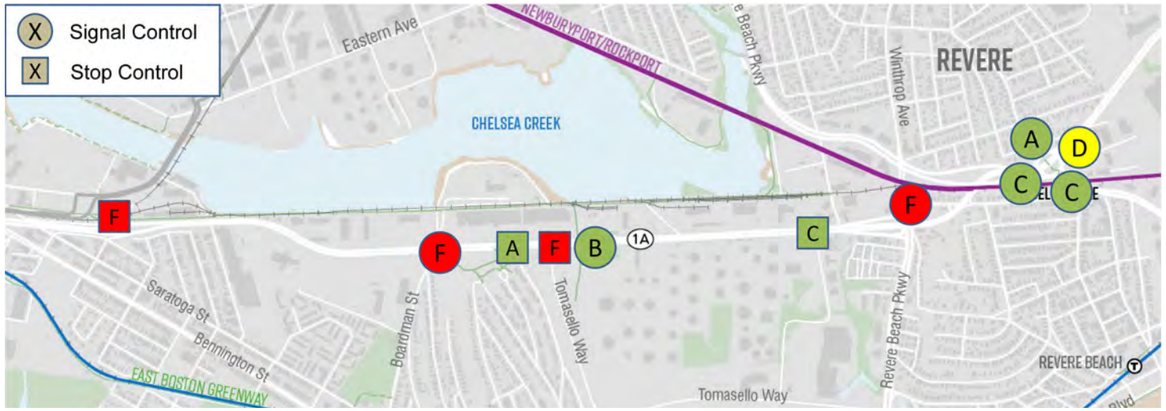


Figure 2–18.Auto Level of Service – Existing – Morning Peak Hour

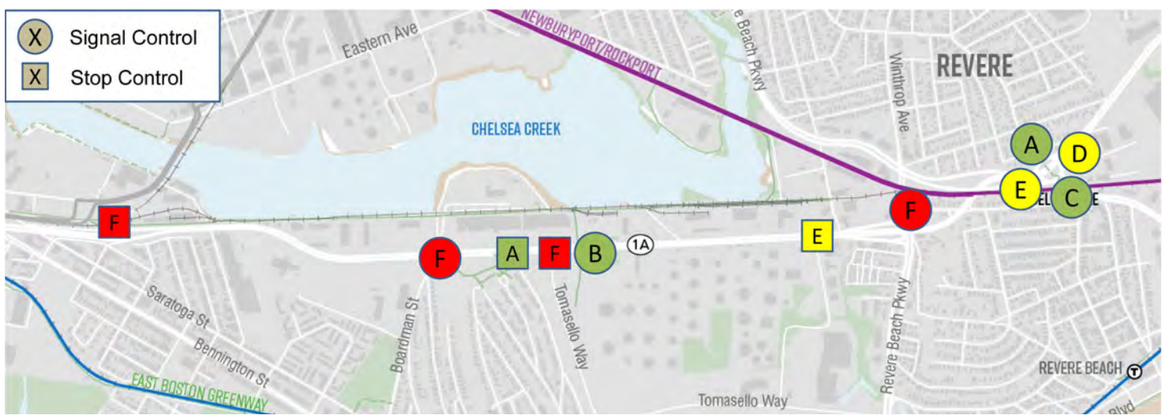


Figure 2–19.Auto Level of Service – Existing – Evening Peak Hour

Figure 2–20 and Figure 2–21 show projections of future vehicular traffic conditions for 2040, with the Suffolk Downs mitigation commitments already in place. Intersections at Boardman Street, Furlong Drive/Railroad Street, and Revere Beach Parkway would operate at an F level in both peak hours, Bell Circle would operate at either a D, E, or F level in both peak hours (with the PM hour being the worst), and the Curtis Street intersection would operate at a F level in the AM peak hour.

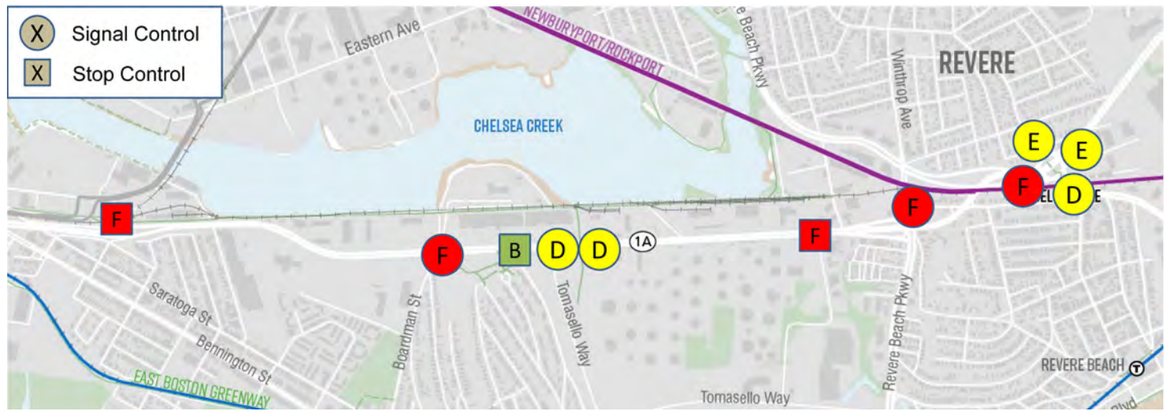


Figure 2–20.Auto Level of Service – Future 2040 with Suffolk Downs Mitigation – Morning Peak Hour

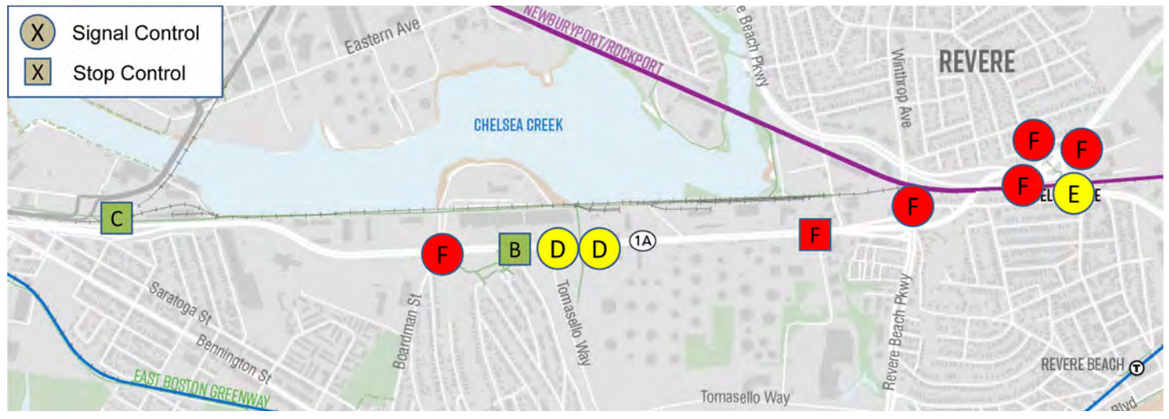


Figure 2–21.Auto Level of Service – Future 2040 with Suffolk Downs Mitigation – Evening Peak Hour

2.3.4. Pedestrian

Existing Conditions

Route 1A in the study corridor is an automobile-oriented roadway that reflects its role as a regional highway and access route for the vehicle-oriented land uses that surround it. Route 1A's existing walking facilities generally do not provide a comfortable or appealing environment for people walking along or across Route 1A in the study corridor. There are asphalt sidewalks provided along Route 1A. However, the sidewalk quality varies and many sections are in poor condition or are narrow. In addition, there are a few segments of sidewalk that are missing entirely, creating gaps in the continuous sidewalk network. In particular, the sidewalks over Winthrop Avenue lack any curb ramps or crosswalks to access from the southern end, creating a pedestrian access gap between the southern and northern ends of the corridor.

There are only four pedestrian crossings within the study corridor that people can use to walk across Route 1A: three at grade intersections at Addison Street, Boardman Street, and Bell Circle, and the Winthrop Avenue underpass beneath the Route 1A viaduct. The intersections are spaced far apart, with a half-mile walk between Addison Street and Boardman Street, 1.0 miles between Boardman Street and Winthrop Avenue, and 0.35 miles between Winthrop Avenue and Bell Circle. In addition, half of the existing bus stops within the study area (six out of 12 bus stops) are not co-located with a crosswalk.

Suffolk Downs mitigation commitments would improve pedestrian conditions within the study corridor through three key pedestrian-oriented improvements.

1. An upgraded "Tomasello Drive" intersection will replace the existing unsignalized Tomasello Way intersection with an intersection that has full traffic signal control. While there is currently no pedestrian crossing at Tomasello Way, the new signalized Tomasello Drive intersection will provide fully accessible, signal-protected pedestrian crosswalks approximately one quarter-mile north of Boardman Street. This will significantly reduce the existing 1.4-mile gap that currently separates Boardman Street from Bell Circle.
2. 2. A new pedestrian crossing of Route 1A at the southern end of the study corridor, connecting the west side of Route 1A near Curtis Street to the east side of Route 1A near Moore Street. In addition, the Suffolk Downs improvements at the Curtis Street/ Route 1A Southbound intersection will improve comfort for pedestrians on the sidewalk along the western edge of Route 1A.
3. A new shared use "Community Path" along the eastern (northbound) side of Route 1A running from just north of the Courtyard by Marriott frontage to Tomasello Drive will provide pedestrians and bicyclists with an improved connection along a significant segment of the Route 1A corridor.

At intersections with streets that intersect Route 1A, accessible curb ramps are mostly missing or are poor quality, and crosswalk markings are missing from many as well. The street also has many large curb cuts that provide vehicle driveway access to sites along the street. The sidewalk generally is generally discontinuous at every driveway curb cut, some of which are very long and not marked with a crosswalk.

A Level of Crossing Stress analysis can help describe the quality of pedestrian crossings based on factors of the built environment, including vehicle volumes and speeds, signalization, and the presence of protective elements, like pedestrian refuge islands.[1]

Based on a review of conditions on Route 1A, all three of these existing marked crosswalks are higher stress crossings where people must cross multiple lanes of high-speed traffic at a time, often without adequate refuge space between travel directions, as shown in Figure 2–22.

A more detailed description of each existing crossing location along Route 1A is provided following the Level of Crossings Stress map, with visual notes in Figure 2–23

- **Addison Street:** An existing, "ladder-style" crossing at Addison Street is provided across the northern leg of the intersection. The crosswalk is accompanied by a flashing beacon that can be activated when pushed and a median refuge island, though neither the median refuge island nor the ramps at either end of the crosswalk are compliant with the Americans with Disabilities Act (ADA). This crosswalk serves an important pedestrian desire line, however the visibility at the intersection and current level of protection provided for people using the crosswalk create safety challenges. The intersection is located along Route 1A as it transitions from a limited-access highway to an at-grade street, where people driving are either rapidly accelerating or decelerating depending on which direction they are traveling. In addition, the curve of the street limits visibility between people driving and people trying to use the crosswalk, especially for people driving northbound. This crossing also serves a pair of bus stops – one on each side of the street – no amenities are provided at either bus stop.

1 The Level of Crossing Stress analysis was modified for this study based on research from Chapter 14: Multimodal Analysis of the Oregon Department of Transportation's Analysis Procedures Manual, https://www.oregon.gov/odot/Planning/Documents/APMv2_Ch14.pdf

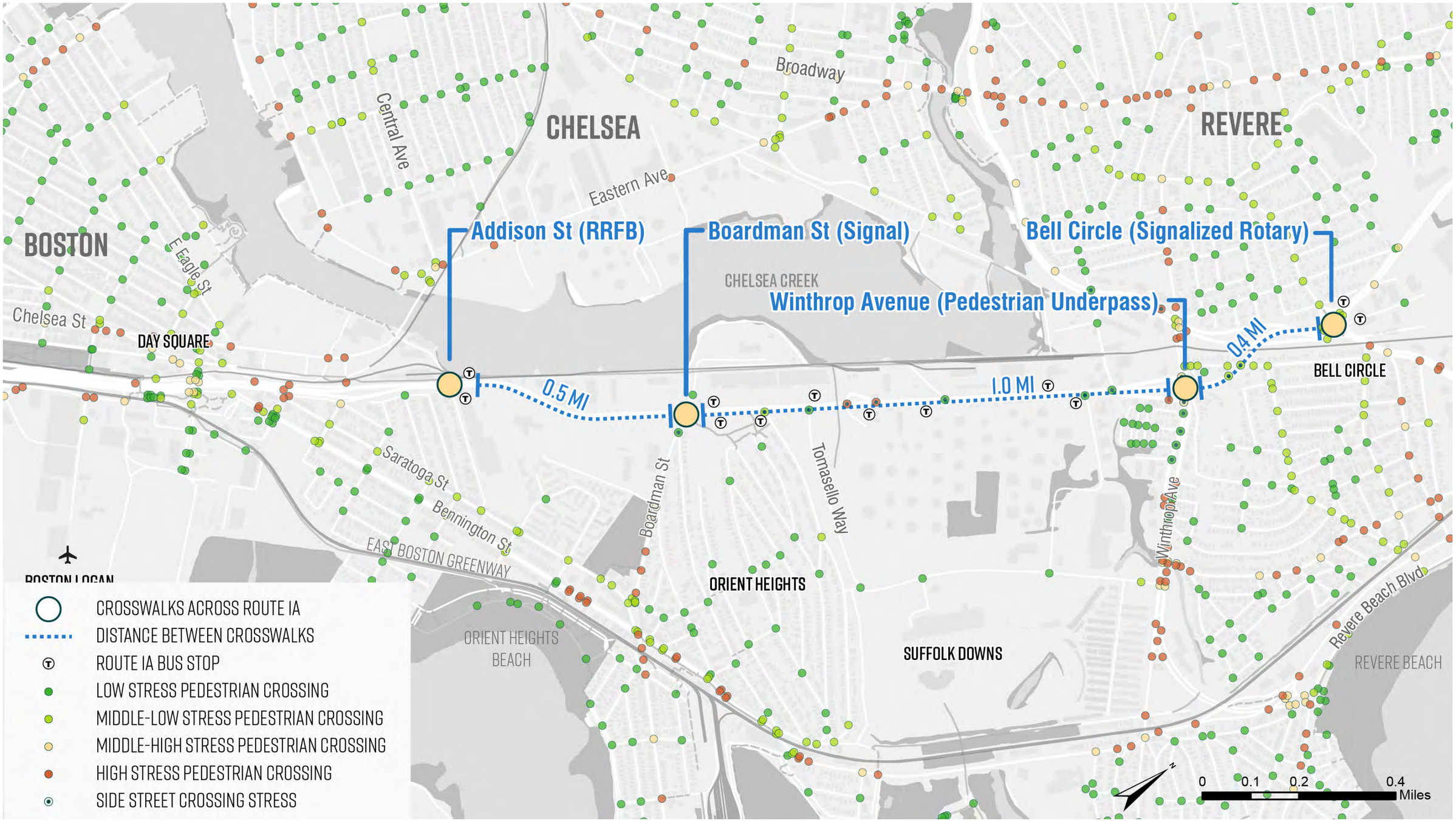


Figure 2–22. Existing Pedestrian Level of Crossing Stress on and around Route 1A

- **Boardman Street:** Crosswalks are provided across all legs of the intersection except the southern leg of Route 1A. All crosswalks operate with concurrent pedestrian phasing and are marked with "standard" markings that consist of a set of lines parallel to the crossing path of travel. Concurrent pedestrian phasing provides pedestrians WALK indications at the same time as the parallel vehicle movement. The crosswalk across the northern leg of Route 1A is accompanied by a median refuge island and is accessed by curb ramps with detectable warnings. Wide corner radii at the end of the crosswalk may contribute to high turning speeds where there are pedestrian-vehicle conflicts. This crossing also serves a pair of bus stops – one on each side of the street – though no bus stop amenities are provided at either bus stop. The crosswalks across Boardman Street are similarly characterized by potentially high-speed pedestrian-vehicle conflicts due to large corner radii, especially on the eastern leg where the channelized right turn lane is unsignalized. Pedestrians in concurrent WALK phases experience high delay at the intersection due to the long cycle length of 214.5 seconds in both the morning and evening peak hour. The average pedestrian delay for all crosswalks is approximately 100 seconds (LOS F) which translates to a "very high" likelihood of noncompliance based on the Highway Capacity Manual (HCM) 2000 criteria. Should a pedestrian arrive at a crosswalk at the end of WALK phase, they would have to wait approximately three and a half minutes (207.5 seconds) before receiving another WALK indication for that crosswalk. With the existing timing plans, it would take approximately four minutes (243 seconds) for a pedestrian to go from the southwest corner on the porkchop island to the southeast corner of the intersection along the provided crosswalks.
- **Winthrop Avenue:** Winthrop Avenue passes beneath the Route 1A viaduct near Winthrop Avenue's intersection with Revere Beach Parkway. Winthrop Avenue provides pedestrian connections across the Route 1A corridor through a grade-separated connection. Although the Winthrop Avenue underpass fully segregates pedestrians from Route 1A traffic, the pedestrian environment is not appealing or comfortable. The northern sidewalk beneath the Route 1A viaduct is only about five feet wide, and lies between the bridge abutment and four lanes of Winthrop Avenue westbound traffic. The southern sidewalk is only about four feet wide at its narrowest point, and is between three lanes of Winthrop Avenue traffic and a guardrail separating the sidewalk from a U-turn ramp connecting Route 1A northbound to Route 1A southbound.

Figure 2–23. Example of a Typical Driveway Treatment on Route 1 A (top left) and Pedestrian Crossing Conditions at Addison Street (top right), Boardman Street (middle), and Winthrop Avenue (bottom)

- **Bell Circle:** Crossing Bell Circle requires people walking to navigate a convoluted and illegible path to cross most legs of the intersection (Figure 2–24). The crossing across Route 1A is located in the middle of the circle where additional vehicle lanes continue through the traffic circle. In addition to this crosswalk, people must first cross entrance or exit ramps and the traffic circle lane itself. In total, five to six separate crosswalks must be used to navigate from one side of Route 1A to the other at Bell Circle, many of which are multi-lane crossings. All crosswalks are marked with "standard" markings that consist of a set of white lines parallel to the crossing path of travel. Most crosswalks are located at signalized legs except for the crossing across Beach Street at John Mooney Road to the west of the circle and the crossing across the traffic circle exit towards westbound Beach Street. Many curb ramps were upgraded in 2018 to include detectable warnings, including those across Route 1A itself, on the interior of the traffic circle, from the splitter island on the west side of the circle, and on the northeast corner of the circle with Veterans of Foreign Wars Parkway. The rest of the curb ramps are not equipped with detectable warnings. While most intersection legs have a crosswalk, there is no crosswalk across the Everett Street leg, making it very challenging to cross from the northeast side of Route 1A, where a bus stop is located, to points south or across Route 1A. The 123-second cycle length results in an average pedestrian delay of approximately 57 seconds (LOS E) at each crosswalk within Bell Circle, which translates to a high likelihood of noncompliance based on HCM 2000 criteria. It is important to emphasize that pedestrians must cross multiple crosswalks to traverse the circle, significantly magnifying the impact of this delay. Depending on walking speeds and crossing from one side of Bell Circle to the other can take three to five signal cycles, translating to between six and 10 minutes to simply walk from one side of the circle to the other.

Other factors – like noise from traffic, shade provided by trees, frequency of driveways, and lighting along the street – can also dramatically impact how comfortable and safe it feels to walk along a street. On Route 1A, the intense volume of noise from passing traffic, frequent and wide driveways, and limited protection provided by shade trees compound poor infrastructure conditions and contribute to generally uncomfortable conditions for people walking.

With limited active uses along Route 1A within the study area and generally uncomfortable conditions for walking, Route 1A is not a place many people choose to walk today. However, with bus stops and several important community destinations along the corridor – including one of the only large grocery stores in the area – Route 1A is still an important connector for the area's residents. MassDOT's Potential for Walkable Trips (PWT) is an analysis tool that demonstrates demand for short, walkable trips based

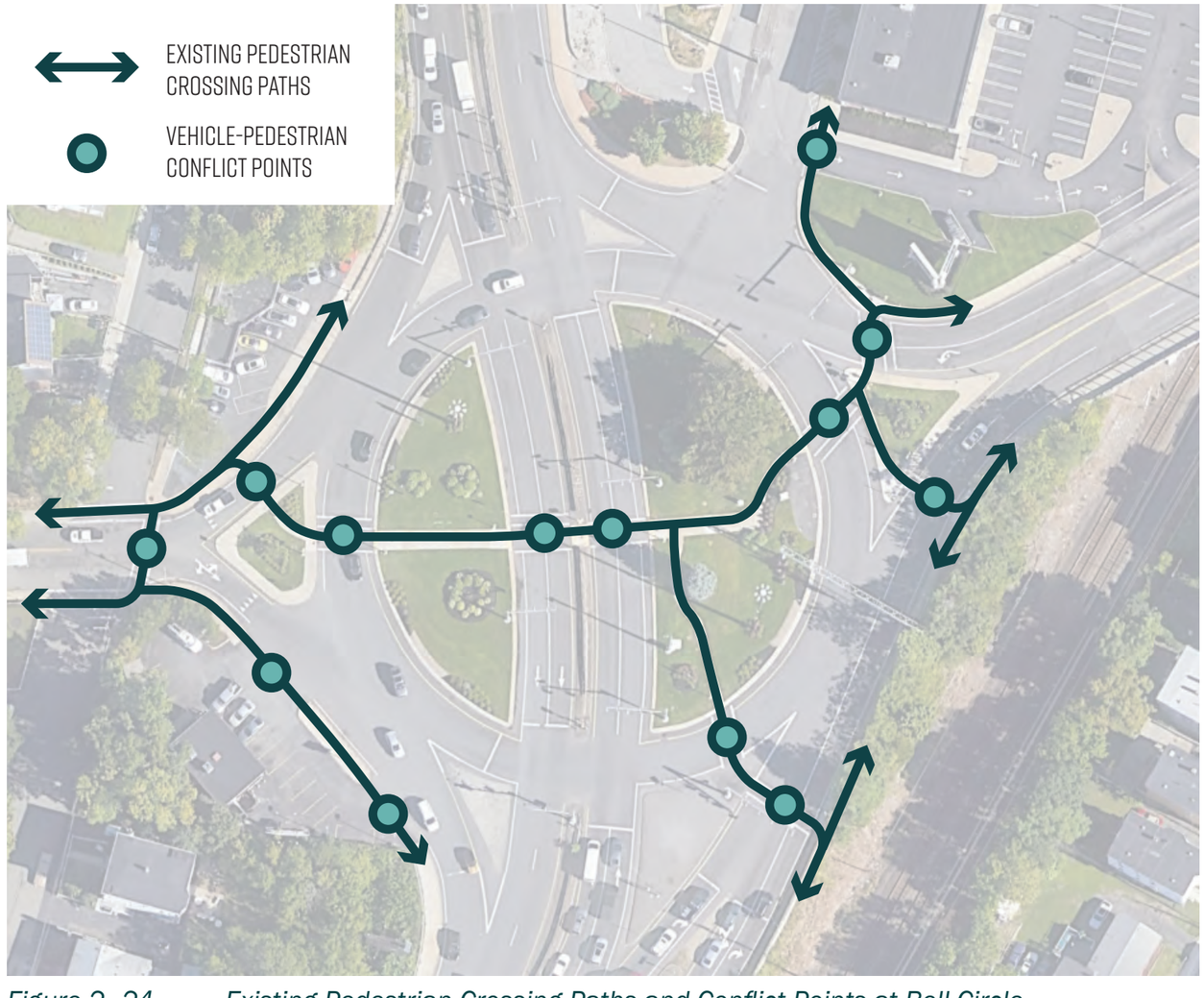


Figure 2–24. Existing Pedestrian Crossing Paths and Conflict Points at Bell Circle

on a number of factors including the number of short trips taken within the area via any mode and the pedestrian crash rate.[2] The analysis also considers the impact sociodemographic factors have on how likely people are to be dependent on walking, and gives a higher walking demand score to those areas. A map showing where these high and low demand areas are located is on the right. Today, demand for walkable trips is highest at either end of the corridor where destinations and activity are clustered around Day Square and Bell Circle (Figure 2–25). The demand for walking trips between Boardman Street and Furlong Drive, however, is low without many residents or destinations to attract walking trips today.

Future Conditions

While the current demand for walkable trips is moderate or low for much of the corridor, new development in Suffolk Downs and the Addison-McClellan EDA will bring residential, office, and commercial uses to the core of the corridor. Approved development at Suffolk Downs includes over 16 million (M) square feet (SF) of new buildings on the site, with over 10 M SF of residential space. Other significant uses on the site include 5.2 M SF of commercial space, 450,000 SF of retail, and 400,000 SF of hotel uses. This mix of land use types will increase the

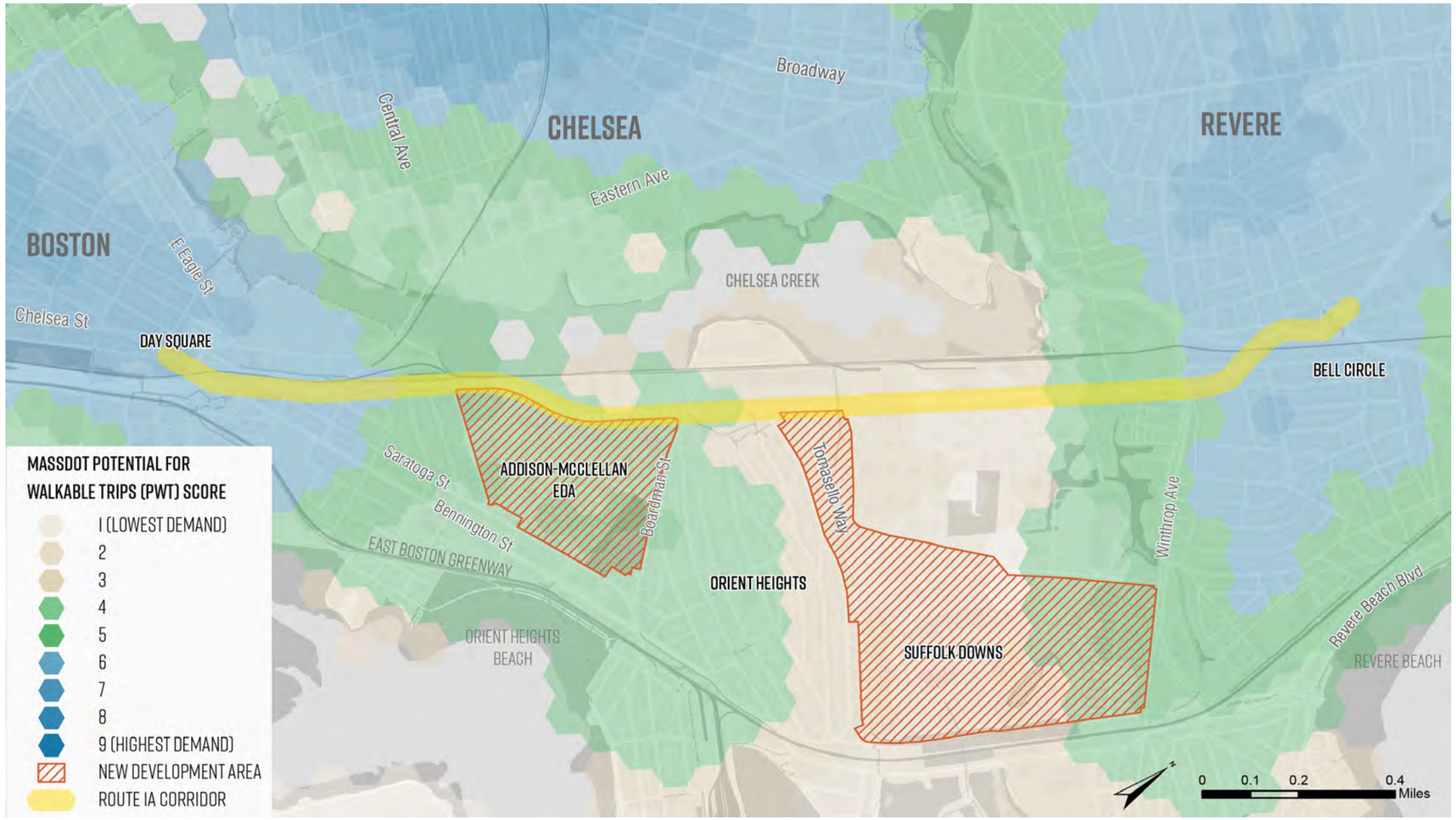


Figure 2–25. MassDOT Potential for Walkable Trips

demand for short, walkable trips; Current estimates suggest that there will be roughly 20,000 pedestrian and bicycling trips in and out of Suffolk Downs at full build.[3]

In addition, transit ridership to and from the site is expected to increase. A natural spine between proposed developments and densely settled sections of East Boston, Chelsea, and Revere, the Route 1A corridor is poised to become an important local transportation corridor in the future.

Anticipated improvements for those walking that will result from implementation of the Suffolk Downs mitigation include a new pedestrian crossing of Route 1A, which would unite Curtis and Moore Streets on either side of the highway, and a reconfigured Bell Circle.

2 MassDOT developed the Potential for Walkable Trips analysis to help understand where people could reasonably expect to walk for everyday travel if safe, comfortable, and connected pedestrian facilities were available on a regional scale. For more information, please visit: https://massdot.maps.arcgis.com/apps/webappviewer/index.html?id=abab2e8c3da446a5ae4b675cd35b5f4f

3 Suffolk Downs EID Certificate, 30 January 2020, 6-18: https://www.suffolkdownsredevelopment.com/project-documents/

2.3.5. Bicycle

Existing Conditions

The design of Route 1A prioritizes moving a high volume of motor vehicles at relatively high speeds through the study area. These conditions make the study area uncomfortable and unappealing for people biking, who operate at a significantly lower speed and without the protection of a vehicle surrounding them. Wide lanes, gentle sweeping curves, a median that often features a guard rail, limited intersections and signals, and few buildings or trees fronting the road all encourage high vehicle speeds and contribute to uncomfortable conditions for people biking. Additionally, there is no dedicated space or physical protection for bicyclists in the roadway (Figure 2–26).

A painted shoulder without any physical barriers from vehicle traffic exists on much of the corridor, but it is too narrow, not marked as a bike lane, disappears at many intersections, and lacks the physical separation needed to be a comfortable place for biking. During field visits, people were seen biking on the sidewalks along Route 1A. However, many of the accessibility issues affecting pedestrians – such as discontinuous sidewalks and missing curb ramps – also affect people on bikes.

A Level of Bicycle Traffic Stress analysis can help describe how stressful streets are for people biking based on factors of the built environment, including vehicle volumes and speeds, signalization, and the presence of protective elements, like dedicated and protected space for biking.[1] Today, the entirety of the study area is considered high stress for people biking based on existing conditions (Figure 2–27). In addition, few of the streets that connect to Route 1A within the study area (and none that parallel it) provide lower stress bicycling conditions. As a result, there is a significant barrier to biking for travel between the neighboring areas of East Boston and Revere.

Adding to the expected stress based on the built environment, other factors – like large and complex intersections – can heighten stress levels for bicyclists.

Figure 2–26. MassDOT Potential for Walkable Trips

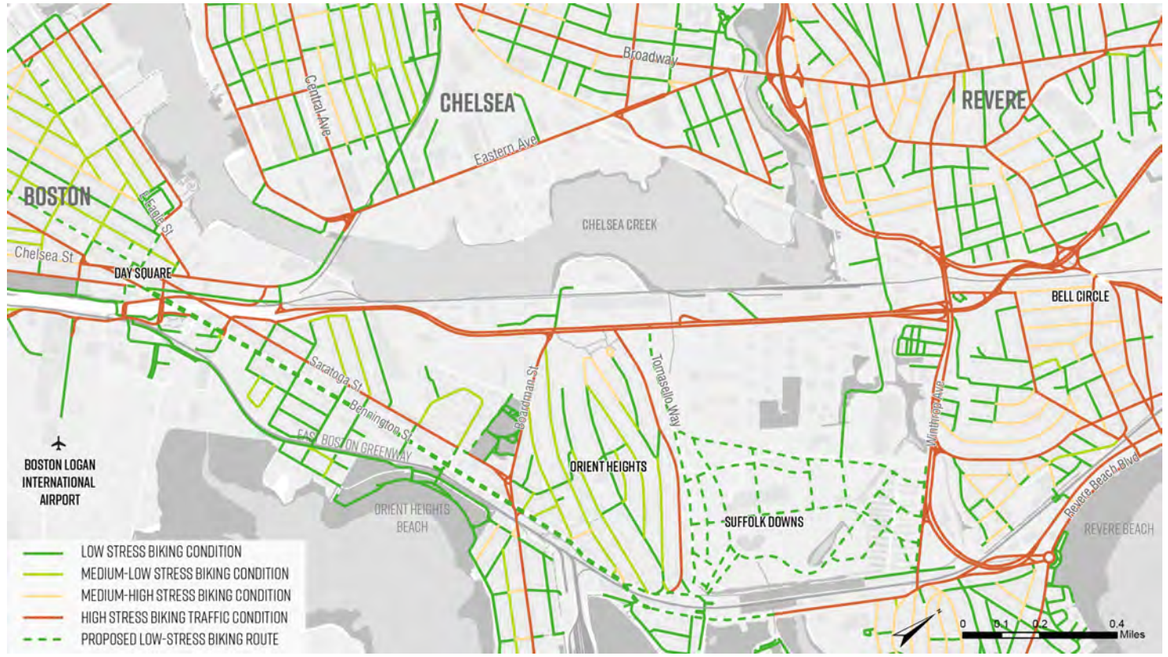


Figure 2–27. Existing and Proposed Bicycle Level of Traffic Stress

1 The Level of Traffic Stress analysis was modified for this study based on research from Professor Peter Furth's "Level of Traffic Stress v.2 June, 2017," https://peterfurth.sites.northeastern.edu/2014/05/21/criteria-for-level-of-traffic-stress/

Similar to the corridor itself, the intersections on Route 1A are optimized for vehicle throughput. The corridor widens at many of the intersections with additional lanes to facilitate vehicle turning movements and large corner radii that make turns possible for large trucks, but also encourage fast movements through turns for smaller vehicles. Between intersections, few buildings or trees front the street and highway design elements, such as guardrails and large signage, create an environment that makes biking appear out of place. While the surface quality is generally smooth, drainage grates and debris in the shoulder create hazards for people riding bikes.

MassDOT's Potential for Everyday Biking (PEB) is an analysis tool that demonstrates demand for short, bikeable trips based on a number of factors including the number of short trips taken within the area via any mode, transit access, and the biking crash rate.[1] The analysis also considers the impact sociodemographic factors have on how likely people are to be dependent on biking, and gives a higher demand score to those areas. Today, demand for biking along Route 1A is clustered around destinations near the northern and southern ends of the study area (Figure 2–28).

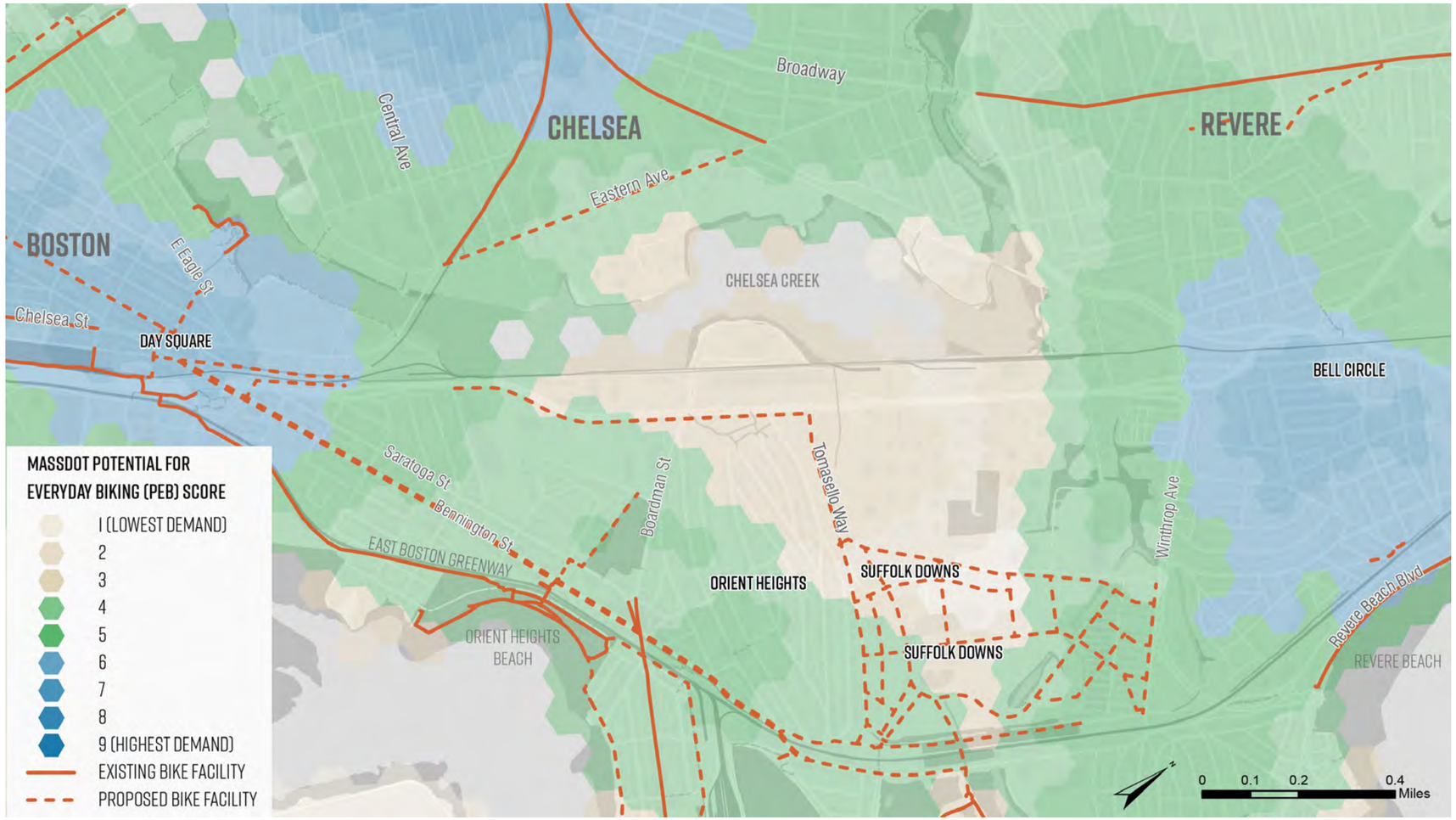


Figure 2–28. MassDOT Potential for Everyday Biking

1 MassDOT developed the Potential for Everyday Biking analysis to help understand where people could reasonably expect to bike for everyday travel if safe, comfortable, and connected bike networks were available on a regional scale. For more information, please visit: https://www.arcgis.com/apps/webappviewer/index.html?id=371274be470c4f9db0543943398eb3d3

Future Conditions

Investments in both existing and new streets in East Boston will bring more and higher-quality bicycle connectivity towards Route 1A and help bridge existing gaps in the biking network (Figure 2–29). Around three-quarters of a mile (an approximately five-minute bike ride) east, Bennington Street roughly parallels Route 1A and provides connections between East Boston and Revere. Plans are underway as part of the PLAN: East Boston effort to add high-comfort bike lanes on Bennington Street within Boston. Additionally, the new street network in the Suffolk Downs site will bring a network of high-comfort biking connections to Route 1A via Tomasello Way.

These investments would allow people biking to comfortably access Route 1A from existing neighborhood streets in East Boston, the Suffolk Downs and Beachmont MBTA stations, and the new Suffolk Downs site. In the context of the extensive development proposed at Suffolk Downs, these investments are important for ensuring growth can be accommodated without burdening East Boston and Revere with the environmental, quality of life, and other costs of increased vehicle traffic. In particular, the Route 1A corridor is poised to become a biking direct desire line connecting Chelsea through East Boston and into Revere as development around Route 1A is completed.

In addition to these local connections, the network of regional shared use paths north of Boston Harbor is quickly expanding. Nearby trails such as

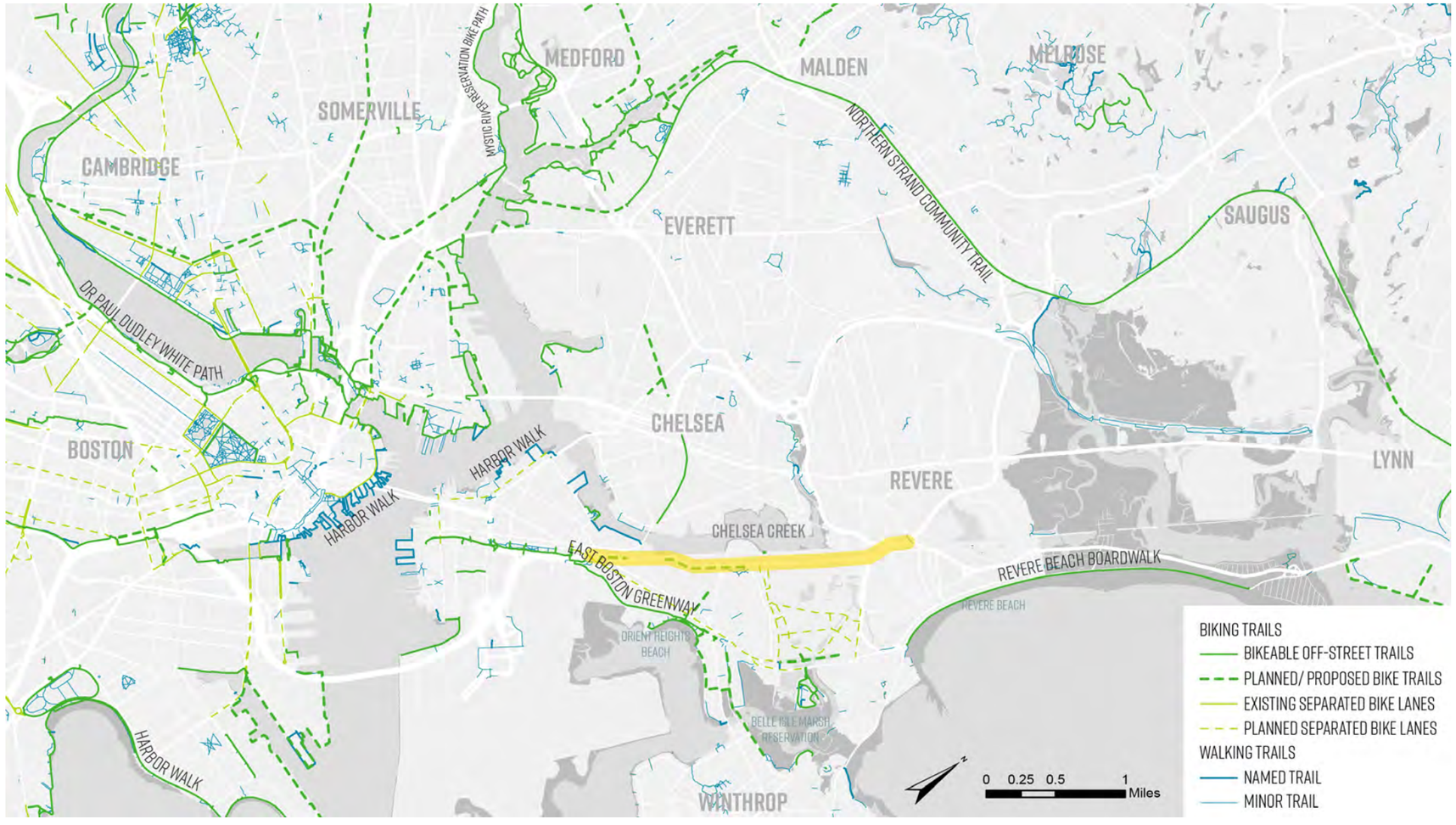


Figure 2–29. Existing and Planned Regional Trail Network

the Revere Beach Boardwalk, the Boston Harborwalk, the Mary Ellen Welch Greenway, and the Chelsea Greenway are all within a half-mile of the Route 1A Study Area. An extension of the Mary Ellen Welch Greenway into the Town of Winthrop is also planned.

Farther away, regionally important trails like the Northern Strand Community Trail are currently being extended farther into Lynn and over the Mystic River into Somerville. Further expansion of this trail network would help extend the reach of bicycle connectivity on the North Shore closer to Route 1A.

2.3.6. Transit

Existing Conditions

The MBTA Blue Line runs parallel to the Route 1A corridor, roughly ½ - ¾ mile east of Route 1A. This well-used heavy rail asset plays an important role in daily commutes between downtown Boston, the study area, and other communities located along the North Shore (Figure 2–30). As noted in GoBoston 2030, East Boston residents reported a transit commute rate of 58 percent, which was 24 percentage points higher than the average Bostonian (Figure 2–31).

However, along the Route 1A corridor itself, transit options are rather limited. Weekday bus service is provided via MBTA Route 450, which operates every 30 minutes during the peak between Haymarket and the Salem Depot. Although the MBTA Bus Route 434 previously served connections between Haymarket and Peabody, it was suspended due to the COVID-19 pandemic. Given off-peak headways of 60-80 minutes on weekdays and a lack of bus service south of Bell Circle on weekends, Route 450 effectively functions more as a long-haul commuter connection for those based along the North Shore than a lifestyle-oriented service for those traveling in East Boston and Revere seeking connections between Bell Circle or Day Square.

Figure 2–30. Existing Rapid Transit and Commuter Rail Lines in Proximity to Study Corridor

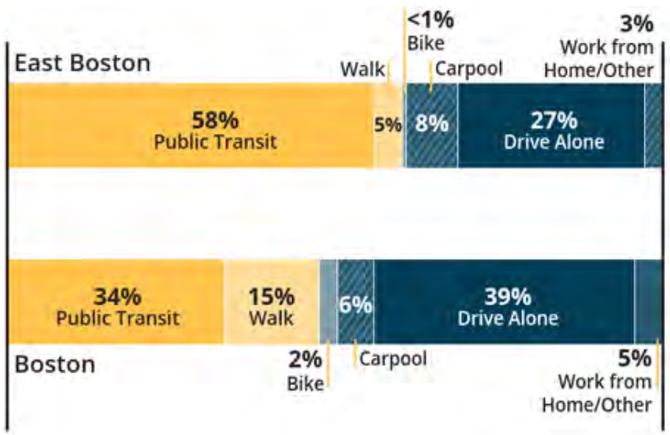


Figure 2–31. East Boston Commuters Take Transit at a Much Higher Rate than the Rest of Boston (GoBoston 2030)

Blue Line

Figure 2–32 and Figure 2–33 show MBTA Blue Line ridership for AM Peak and PM Peak periods during Fall 2019. Blue Line ridership shows a clear peak period and direction for rail passengers, with the dominant flow headed inbound towards downtown Boston during the AM Peak, followed by a reciprocal outbound flow during the PM Peak back to East Boston. On an average weekday morning, approximately 6,600 inbound passengers board Blue Line trains at the five stations north of Wood Island, with the overwhelming majority (6,000 riders or 91 percent) alighting at one of the three downtown Blue Line stations.

While rail journeys in the reverse direction during peak periods are substantially less common (e.g., outbound flows from downtown nearly eight percent of inbound trips in AM Peak), these trips should be not be ignored given they offer regional transit access to the airport-oriented employment opportunities clustered along the corridor.

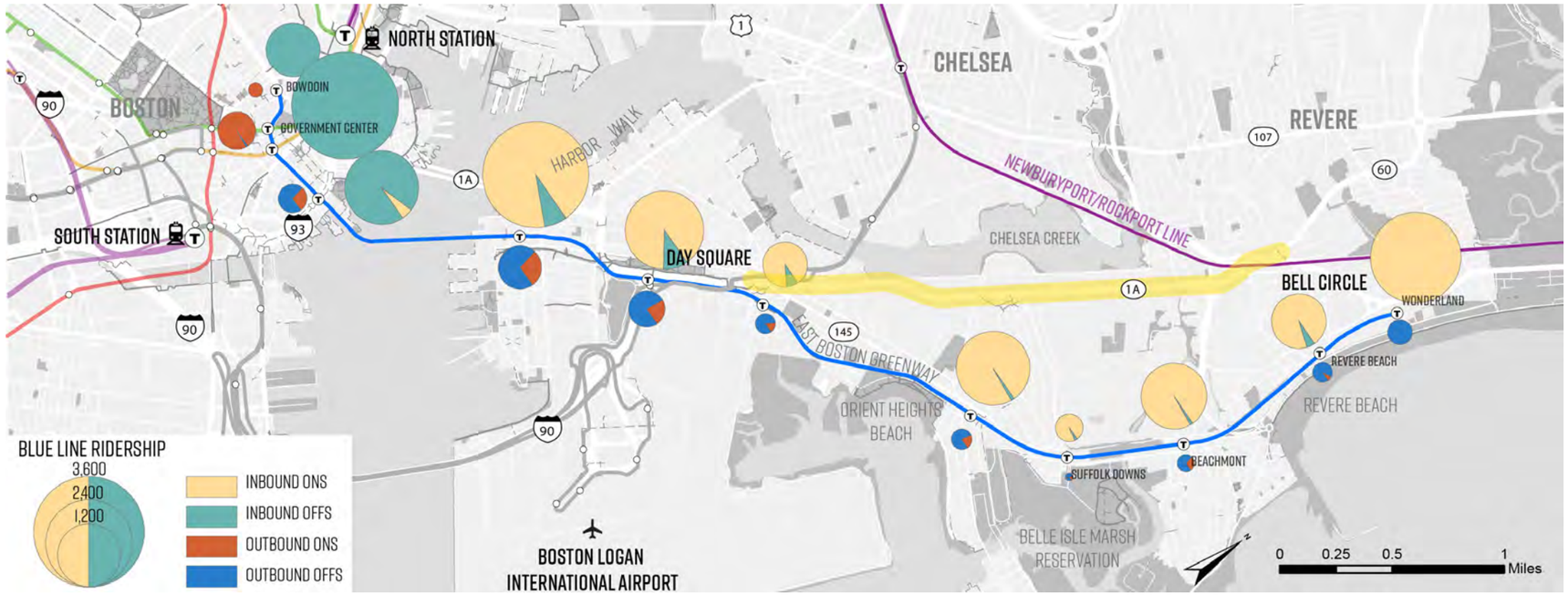


Figure 2–32.MBTA Blue Line AM Peak Ridership

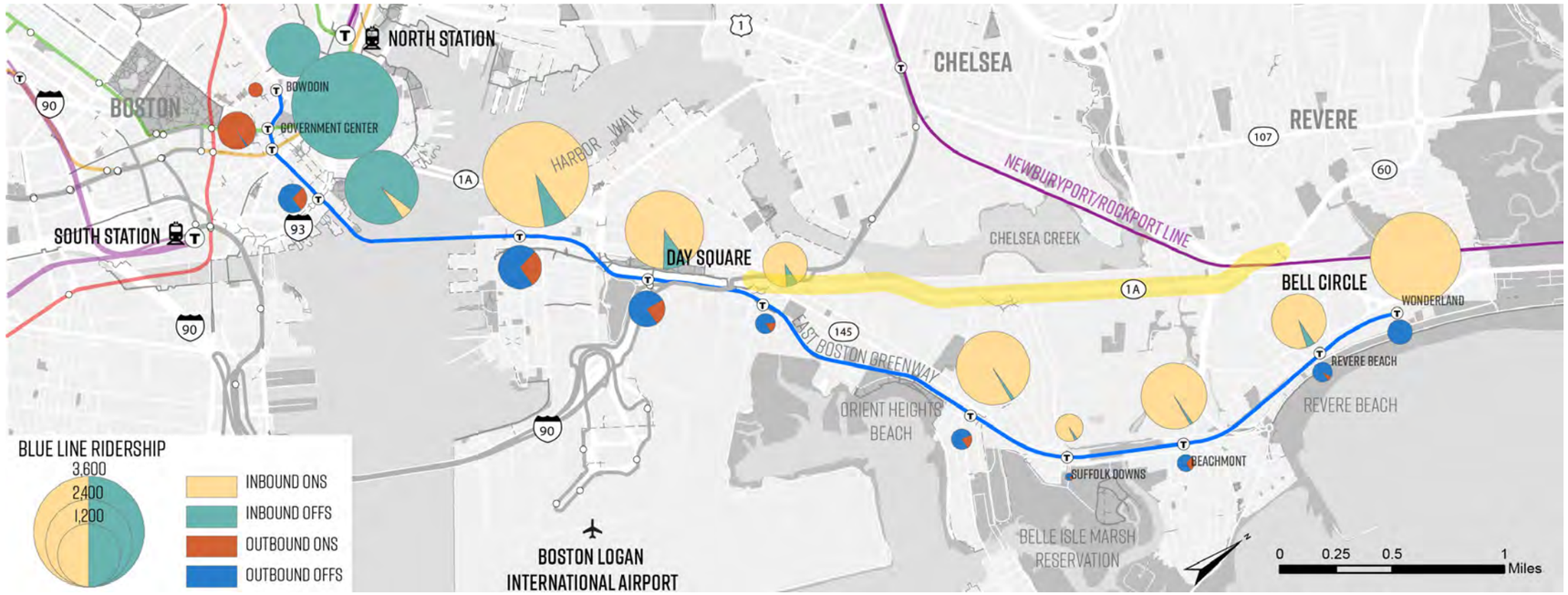


Figure 2–33.MBTA Blue Line PM Peak Ridership

MBTA Bus Route 450

Figure 2–34 and Figure 2–35 display AM and PM Peak hour average bus ridership along the Route 1A corridor during Fall 2019. As noted above, the Route 450 service frequency and span of service are more suited to a peak period, commuter-focused service. Route 450 ridership in the study corridor is very low, with fewer than 10 peak hour boardings in the study corridor. The low ridership in the study area is most likely the result of the vehicle-oriented development patterns and commercial/industrial land uses; poor pedestrian access and unsafe crossings of Route 1A also contribute to low transit ridership.

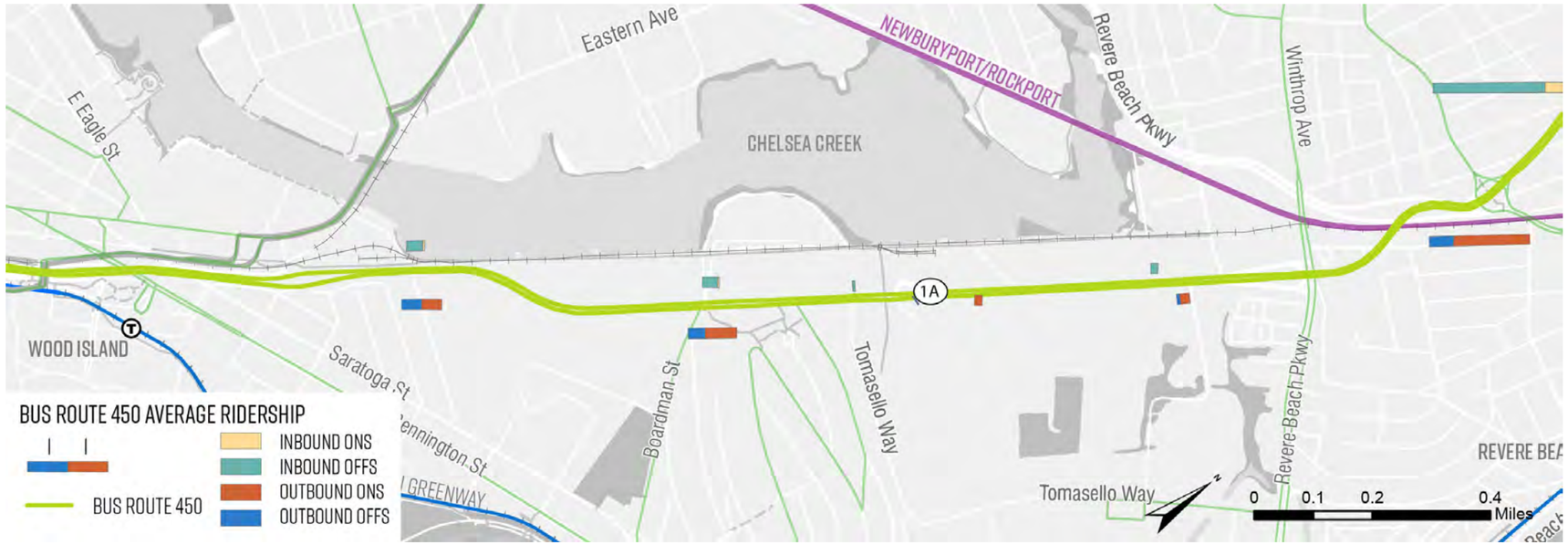


Figure 2–34. MBTA Bus Route 450 AM Peak Ridership

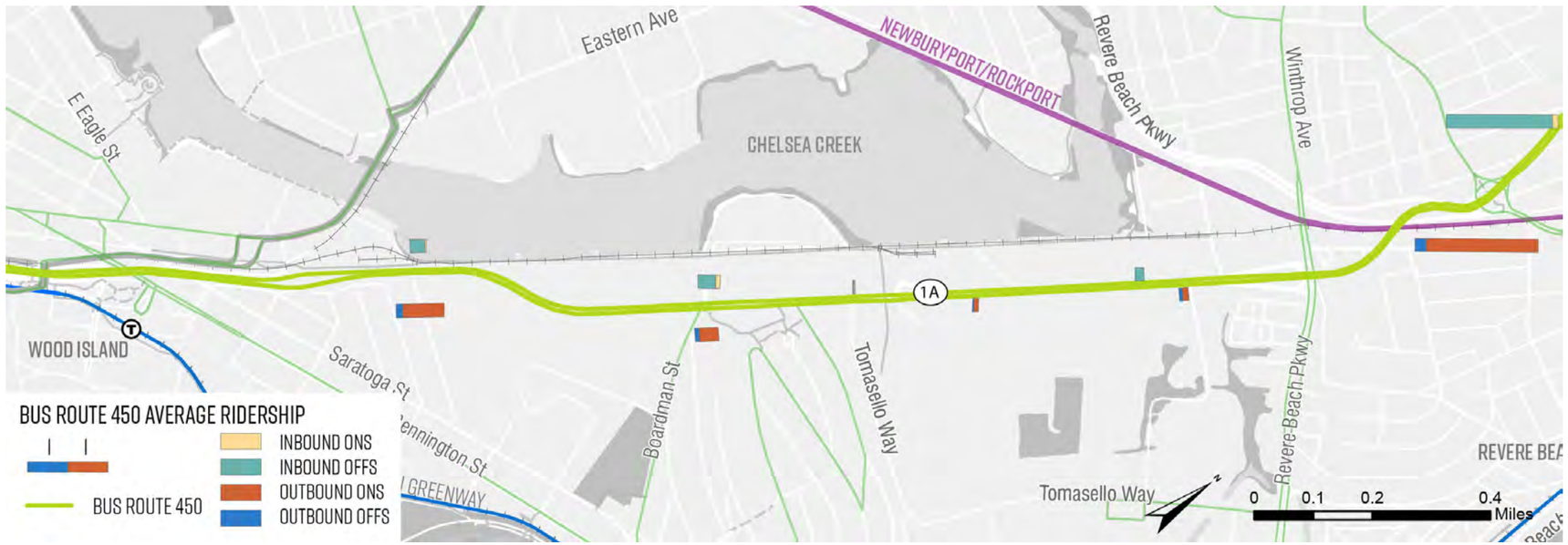


Figure 2–35. MBTA Bus Route 450 PM Peak Ridership

Future Conditions

Future Bus Services

As noted in the previous section on existing transit conditions, bus ridership in the Route 1A corridor is very low, with fewer than 10 boardings of the Route 450 bus in the corridor during peak hours. As a result of this low transit demand and the non-transit-supportive development patterns of the study corridor, the recommendations from the MBTA's recent Bus Network Redesign (Figure 2–36) would eliminate all bus service along Route 1A in the study corridor.

Instead of continuing along Route 1A between Salem and Haymarket, Route 450 would be rerouted to run between Salem to Wonderland. For service to downtown, Route 450 riders would transfer to the Blue Line. Route 112, which currently services a local stop on Chelsea Street at Curtis Street, would be absorbed into a high-frequency service "T104" route that runs between Airport Station on the Blue Line and Malden Center, with service on the Orange Line, Haverhill Commuter Rail Line, and several other bus routes.

The MBTA Board of Directors approved the new BNRD bus network, and the MBTA will work to implement the new bus routes.

Figure 2–36.MBTA Bus Network Redesign Would Eliminate Service

Future Transit Context

As noted in Section 1.4.12 (Transit Studies) and depicted in Figure 2–37, there are several major projects and studies underway in Boston, Chelsea, Revere, and other communities, that have the potential to make transit trips easier for riders throughout the region by proposing:

- 15/30-minute electrified train service at a new Commuter Rail station near Bell Circle (adjacent to the Blue Line's Wonderland station). This component of the MBTA Rail Vision's "Full Transformation" alternative would provide new rail transit access, provide a new Commuter Rail-to-Blue Line connection, and like increase the demand for pedestrian activity in Bell Circle. The new rail connection could also enhance development potential in the Bell Circle area.
- Bus-only lanes along Chelsea Street
- New Silver Line Station at Day Square
- Improved pedestrian and bicycle connections between the study corridor and Blue Line stations via the Suffolk Downs redevelopment

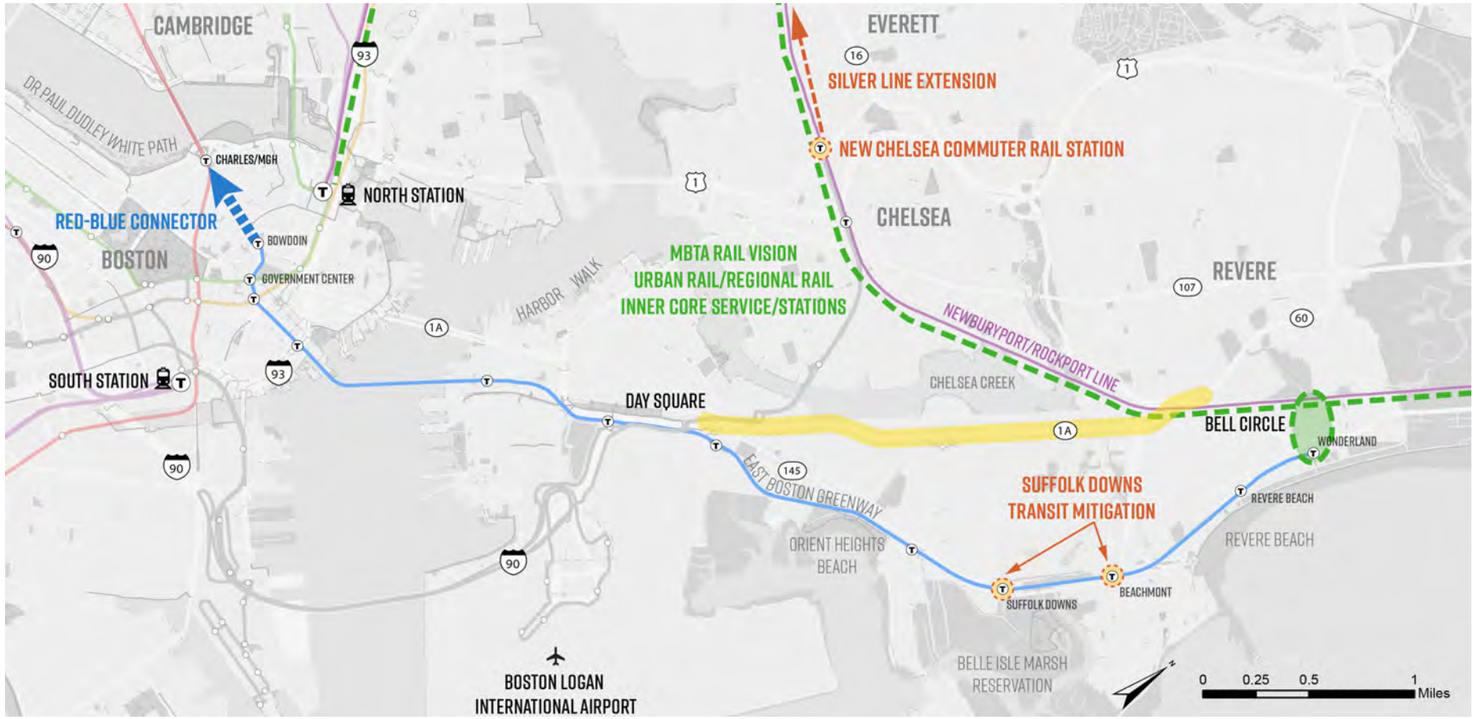


Figure 2–37. Potential Future Transit Conditions

2.3.7. Transportation Issues & Opportunities

Corridor Configuration Issues

Numerous physical elements limit the potential corridor in many different ways.

- Route 1A itself was not designed for multimodal travel and consequently does not have adequate infrastructure for non-motorized modes.
- The existing active industrial uses along Route 1A limit public access to the rail right-of-way and the Chelsea Creek waterfront.
- In addition to being a physical barrier, these industrial uses often tend to have impermeable surfaces, thus heightening flooding risks and associated hydrological run-off problems.
- The study corridor – including both the rail right-of-way and Route 1A – is vulnerable to and prone to flooding given its location along Chelsea Creek and East Boston's historic geography as a group of islands connected by fill.
- The rail parcels are not characterized by uniformity of physical elements. Parcel width varies widely in the study area, ranging from 30 feet to 85 feet.
- There are grade differences between Route 1A and the rail parcels at many points along the corridor, with the rail right-of-way lying at lower elevation than Route 1A.

Corridor Configuration Opportunities

Several differing visions have been proposed for the redevelopment of the rail right-of-way by various stakeholders.

- Recreational. The rail corridor has been envisioned as open recreational space, a passive linear park, and a multi-use trail location.
- Passive Natural Space. There have also been proposals to dedicate the rail parcels for ecological restoration, complete with measures designed to improve resiliency in the face of impending climate change.
- Vehicular Connection. The rail corridor has also been proposed for vehicular use.
  - A freight corridor has been proposed along the rail corridor to improve freight movements along the Route 1A corridor, especially from Logan Airport, by creating dedicated freight transportation facilities and increasing industrial development along Chelsea Creek.
- Neighborhood Connectivity. The rail parcels have also been proposed as potential locations for waterfront access from East Boston neighborhoods. Such linkages have been envisioned to connect existing intersections of Route 1A at Tomasello Way, Boardman Street, Addison Street, Chelsea Street, and Curtis Street. Furthermore, these parcels, in conjunction with the aforementioned intersection connections, could provide Chelsea Creek waterfront access for the massive Suffolk Downs redevelopment.

Redevelopment of Suffolk Downs will result in implementation of the mitigation efforts outlined below over the course of the multi-year build-out.

- Highway mitigation focused on better connectivity and capacity improvements for the following key locations:
  - Route 1A near Tomasello Way
  - Route 1 and Route 16 interchange
  - Bell Circle
  - Winthrop Avenue at Harris Street intersection
  - Winthrop Avenue Corridor
  - Route 60 at Breed Street (to allow for left-turn on Route 60)
- Transit mitigation including:
  - MBTA bus Routes 110,116/117, 439, 411, and 441/442 remain the same as in the 2040 Build Land Use (No Mitigation) scenario
  - MBTA bus Routes 119, 424, 426/426W, 428, 429, 434, 450 and 455 were re-routed to serve Beachmont Station
  - Blue Line peak headway of 4.5 minutes
  - Free off-site regional connector shuttles:
    - Chelsea Commuter Rail Station Shuttle
    - North Station Shuttle
    - South Station Shuttle

Roadway Safety Issues

The high vehicle speeds accommodated on the southern end of the Route 1A corridor seem to correlate with the high crash and fatality rates in that location, particularly near Curtis Street

and at the curve south of Boardman Street.

Roadway Safety Opportunities

Reduction in vehicle travel speeds on the southern end of the corridor, achievable through traffic calming and other measures, could translate to improved safety for motorists, cyclists and pedestrians.

Route 1A Issues

Problematic traffic and vehicular issues exist along Route 1A.

- Southbound Route 1A at Curtis Street: High-speed southbound vehicles are uncontrolled at Curtis Street, and they may either continue southbound on Route 1A, exit to the off-ramp/frontage road next to the Route 1A viaduct, or turn right on Curtis Street. Meanwhile, Curtis Street vehicles, many of which are trucks, must stop at a stop sign, then enter Route 1A southbound from a full stop. These entering vehicles must cross a wide path and then merge with fast moving traffic; it is also very difficult for drivers entering from Curtis Street to determine whether southbound vehicles are continuing south on Route 1A, turning right onto Curtis Street, or making a high-speed exit onto the frontage road, directly in conflict with the entering vehicles.
- Northbound, at the Chaucer Street on-ramp: The street design contributes to drivers treating Chaucer Street like a highway on-ramp, while drivers entering from Curtis Street and Chaucer Street (from the neighborhood) have limited visibility due to intersection design and parking. In addition, the Chaucer Street merge onto Route 1A northbound provides poor visibility and a short acceleration lane.
- Addison Street: There is a crosswalk with a Rectangular Rapid Flashing Beacon (RRFB) across Route 1A at Addison Street. This limited traffic control device is not well-suited to controlling traffic on a four-lane, high-speed highway. This is especially true for northbound drivers, for whom this could be the first traffic control device they encounter after traversing interstate highways to the Route 1A viaduct. Stakeholders and study area residents have reported poor driver compliance with the RRFB at this location.
- Boardman Street: The high-volume intersection operates with split signal phasing for the side street, further reducing the intersection's operational efficiency.
- Boardman Street: Queues from the Starbucks that extend north along southbound Route 1A reduce capacity and increase crash risk, as southbound Route 1A drivers may not expect or see the queued vehicles.
- Poor curb definition along northbound Route 1A near Furlong Drive (Sunoco Gas Station and to Winthrop Parkway) makes it difficult for drivers to know where to turn (especially into the Target / Stop n' Shop shopping center), and may expose pedestrians who are crossing the driveway to conflicts with vehicles.
- The lack of wayfinding signage approaching the Winthrop Parkway ramp may result in excess circulation and VMT, as drivers may not be aware that they can exit Route 1A, turn right, and then make a U-turn at a designated location.
- The weaving area created by the current design of where Route 1A, Railroad Street, and the Winthrop Avenue on-ramp converge presents a safety risk for drivers.

Route 1A Opportunities

Opportunities to address these issues are detailed in the bullets below, with each opportunity number matching the issue number listed above. Specific alternatives and concepts will be outlined in Chapter 3 (Alternatives Analysis).

- One of the Suffolk Downs Improvement ideas is a design to improve the safety and clarity of the southbound Route 1A at Curtis Street intersection through the construction of a large channelizing island, new pavement markings, and a stop sign for drivers exiting Route 1A to continue to Saratoga Street. However, there may also be opportunities to quickly implement other treatments that achieve similar results sooner.
- Prior to a more significant realignment of Route 1A, explore "paint, post, and signage" traffic calming treatments at the Chaucer Street at Curtis Street intersection.
- Long-term opportunities to improve driver compliance at the Addison Street crosswalk include more substantial traffic control (e.g., a full signal). In addition to robust control devices, signage (e.g., advance "SIGNAL AHEAD" sign with a flashing beacon) could also be used as a complementary treatment to support short-term and long-term solutions.
- To improve operations at the Route 1A at Boardman Street intersection, evaluate new lane configurations on the intersection's eastbound approach.
- To mitigate the effect of queues extending from Starbucks, continue to refine traffic management and access to the parcel.
- Evaluate short-term solution to further prevent vehicles from turning left out of Tomasello Way onto southbound Route 1A.
- Explore short-term and long-term solutions and products to clarify northbound Route 1A curb near Furlong Street.

- Add signage in advance of and along the Route 1A northbound off-ramp to Winthrop Avenue informing drivers that they can turn left after a right-turn followed by a U-turn.
- One of the Suffolk Downs Improvements proposes to redesign the Winthrop Avenue southbound on-ramp intersection with Railroad Street to eliminate the merge area. This design prevents southbound Route 1A drivers from entering Railroad Street and creates two lanes on the on-ramp to separate drivers destined for Railroad Street and southbound Route 1A.

Bypass Road Issues

- Any bypass road facility would need to access the street network at both of its termini as well as potentially at Boardman Street, where there is a bridge over the rail right-of-way.
- The rail corridor ends at Addison Street, which would require any vehicles using the corridor to either enter Route 1A or navigate through privately owned parcels to the south.

Bypass Road Opportunities

- At the southern end of the corridor, the bypass road would have a feasible connection to the existing Martin A. Coughlin Bypass Road after passing underneath the existing Curtis Street bridge. To the north, there is an opportunity to connect a bypass road to the existing jughandle intersection. Bypass road connections to bridges or roadways between the termini could involve raising the bypass road or ramps down to the bypass road in the rail corridor.
- Coordination may be required with private property owners to continue a potential rail corridor facility south beyond Addison Street.

Bell Circle Issues

Bell Circle features a number of existing operational and safety issues, which were studied and chronicled in a 2018 Roadway Safety Audit. The issues include:

- The northbound queues extending south from Bell Circle can cause sightline and expectancy issues for drivers due to both the length of the queues and the horizontal geometry of the roadway
- Bell Circle has no bicycle facilities, has circuitous routing for pedestrians crossing through the intersection, and has sub-standard or completely lacking pedestrian facilities – all of which contribute to an uncomfortable and unpleasant experience for nonmotorized users.
- There are six (6) approaches entering the circle, four (4) of which are signalized. Drivers entering from the unsignalized approaches, Beach Street, and Everett Street, often must force their way into the circle, and in the case of Everett Street, do so from a stop bar set back nearly 50 feet from circulation. These unsignalized approaches and setbacks reduce capacity and increase crash risk.
- The parcels within the circle (currently PLS Checks Cashed and Circle Auto Sales) add to the number of entry and exit conflict points within the Circle and their current access points limit redesign opportunities for the intersection as a whole.
- The intersection's circulating roadways lacks lane markings, which reduce capacity, contribute to driver uncertainty, and increase crash risk.
- The lack of adequate and advance wayfinding signage contributes to driver uncertainty and reduces operational efficiency, especially for those less familiar with the intersection, including those drivers destined for Logan Airport, who are more likely to be traveling from further afield.

Bell Circle Opportunities

There are similarly a number of opportunities to improve the safety, circulation, clarity, and capacity at Bell Circle. Several suggested treatments and designs were identified through both the 2018 RSA and the Suffolk Downs Improvements to address Bell Circle's many issues:

- Opportunities to address queue visibility include advance queue detection systems and operational improvements at Bell Circle to reduce queue lengths.
- Opportunities to improve pedestrian and bicycle comfort and safety include upgrading ramps and sidewalks to meet ADA minimum standards, adding crosswalks and pedestrian signals to provide safety crossing at all approaches, and other longer term redesign opportunities.
- There may be shorter-term opportunities for paint and post and/or curb extensions to clarify the mixing zones near Beach Street and Everett Street. Longer-term, there are a number of more significant redesign opportunities available to reduce the number of approaches to Bell Circle, clarify traffic movements and circulation, and improve safety.
- There may be short-term opportunities to redesign access into and out of the PLS Checks Cashed and Circle Auto parcels to the Circle's overall safety and circulation and

minimize weaving and sudden merging.

- Other short-term opportunities are adding pavement markings, including striping within Bell Circle as well as pavement markers on roadways in advance of Bell Circle to aid in navigation.

Pedestrian and Bicycle Issues

- With its width, large volumes of high-speed traffic, and widely-spaced crossings, Route 1A can present a barrier to neighborhood walking and cycling.
- The Route 1A corridor is generally not comfortable or appealing for non-motorized modes of travel. Not only does vehicular traffic travel at high speeds and produce considerable noise, but the corridor's walking and cycling infrastructure is substandard.
- Accessibility is a key issue; most of the corridor's intersections, large commercial driveways, and sidewalks are not compliant with federal and state accessibility standards under the Americans with Disabilities Act (ADA) and the Massachusetts Architectural Access Board.
- Pedestrian
  - Parts of the corridor lack sidewalks.
  - Existing pedestrian crossings of 1A are spaced far apart. The closest gap is 0.5 miles between crossing opportunities, while the longest is 1.4 miles.
- Bicyclist
  - Route 1A lacks any space for accommodating cyclists. Bicyclists often end up using sidewalks as a result.

Pedestrian and Bicycle Opportunities

The Suffolk Downs Redevelopment project has proposed several bicycle and pedestrian improvements in the study area as mitigation for the project's transportation impacts.

- A Shared Use Path is proposed along the eastern edge of Route 1A between Addison Street and Tomasello Way.
- This facility would link to the internal Suffolk Downs Shared Use Path and pedestrian / bicycle network.
- 12 new BlueBike stations.
- The extension of the East Boston Greenway to Suffolk Downs,
- A cycle track along Winthrop Avenue.
- A proposed greenway extension from Suffolk Downs north to Revere Beach.
- A more robust non-motorized connection between the Route 1A corridor and Orient Heights/Suffolk Downs via the reconfigured Tomasello Drive.

Transit Issues

- Pedestrian access to / from the available bus stops is characterized by limited safe pedestrian crossing opportunities and intersections that do not provide ADA-compliant accessibility.
- The waiting environment at stops within the study area lack amenities that might otherwise enhance the comfort and/or safety of those waiting for the bus along Route 1A; this is most relevant for stops with a preponderance of boardings (rather than alightings), since boarding passengers are typically those that must wait at the bus stop.
- Existing bus service along Route 1A is not geared towards the needs of local users and, as a result, ridership along the study corridor is very low.
- Existing land uses in the study are not transit-supportive; they are generally industrial, lower-density, and geared toward motor vehicle access.

Transit Opportunities

- Through the PLAN: East Boston process, the City of Boston is working with the MBTA to install new bus-only lanes along Chelsea Street and a new SL3 station in Day Square.
- As part of the Rail Vision proposals, the MBTA has proposed an in-fill Commuter Rail/ urban rail station northeast of Bell Circle that would provide rail transit access for the neighborhood and facilitate transfers to / from the Blue Line's Wonderland. This change could enable new transit-oriented development patterns near the new rail station and Bell Circle.
- Although current and proposed land uses are generally not transit-supportive, there are long-term opportunities for transition to denser, more transit-supportive development patterns. If future land use in the corridor could better support transit demand and usage, a bypass road could provide access for transit vehicles. As with other vehicles, a potential bypass road could enable transit vehicles to avoid congestion on Route 1A and enable a faster, more reliable trip through the study corridor.

2.4. ENVIRONMENT, SUSTAINABILITY, AND RESILIENCE

2.4.1. Environmental Conditions

Figure 2–38 shows environmental resources and potential contaminations along the corridor, including many MassDEP oil and/or hazardous material sites with activity use limitations, fuel tank areas, airport uses, and industrial uses parcels along the corridor. The graphic also shows wetland areas, Chapter 91 tidelands, and Areas of Critical Environmental Concern.

2.4.2. Resilience

Flooding Vulnerability

As climate change contributes to rising sea levels and increased storm severity, low-lying areas are more vulnerable to flooding from Chelsea Creek, as well as inland precipitation. Figure 2–39 shows flooding vulnerability in the study area, including current 1 percent annual flood zone (with no sea level rise), 2030 projected 1 percent annual flood zone, 2070 projected 1 percent annual flood zone, regulatory floodway, and high-risk coastal area. Most of the middle segment of Route 1A corridor have risk of flooding for low-lying areas including natural waterways and filled land between original islands, creating flood-prone areas and storm surge infiltration pathways.

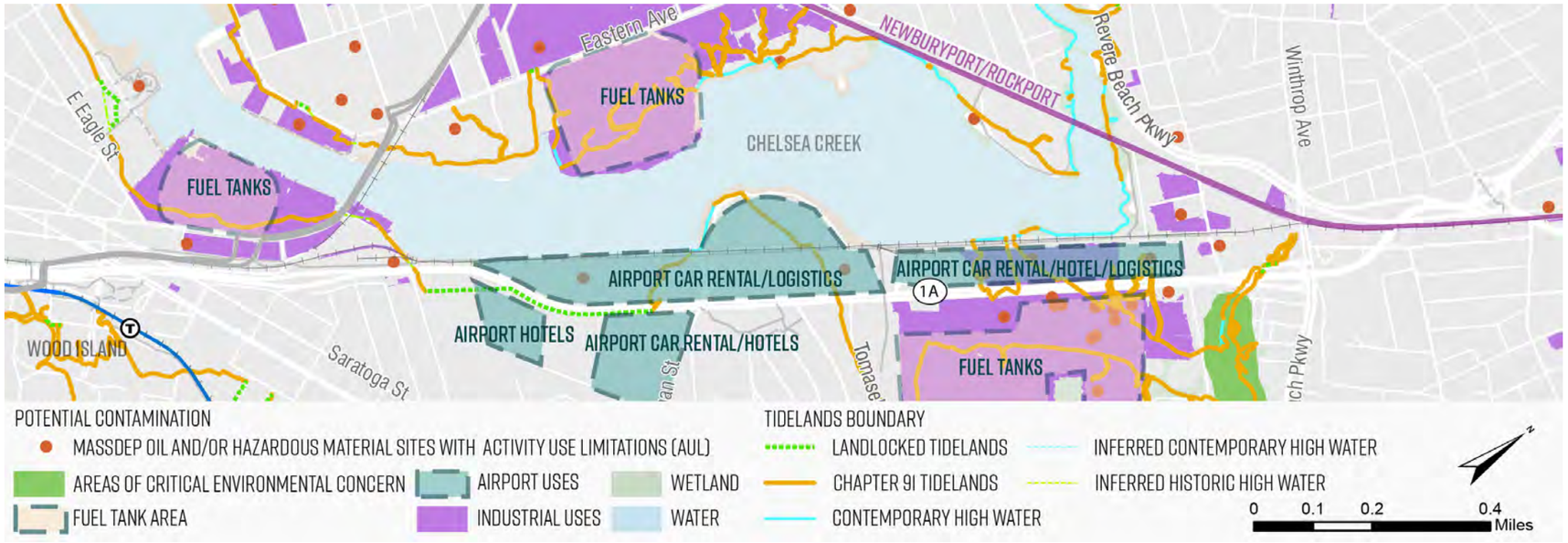


Figure 2–38. Potential Contamination, Chapter 91 Tidelands, Wetlands, and Areas of Critical Environmental Concern along the Study Corridor

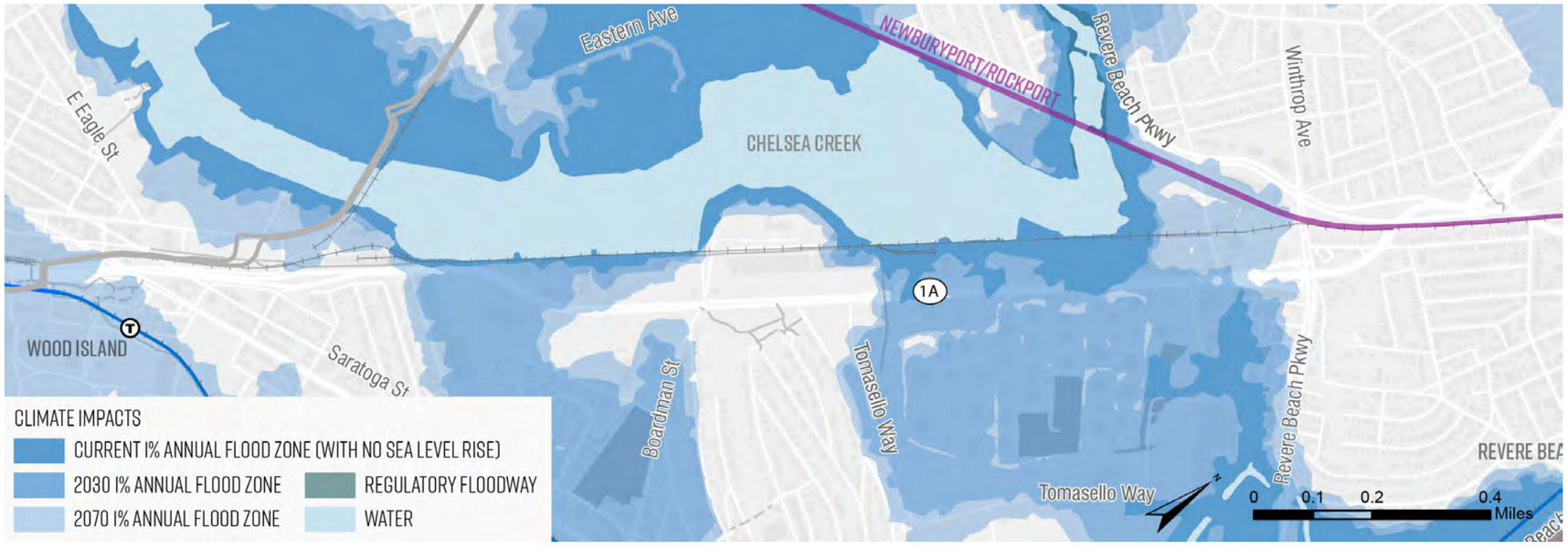


Figure 2–39. Flood Zones along the Study Corridor

Open Space, Permeability and Urban Heat Island Effect

Figure 2–40 shows the limited infiltration and absorption potential of a corridor consistently dominated by industrial, airport-related, and auto-oriented land uses.

Figure 2–41 demonstrates the limited public open space available (green), which might otherwise be used to enhance the corridor's ability to withstand storm surges via resilient infrastructure.

The limited permeability and persistent presence of asphalt contribute to the urban heat island effect, generating higher ambient temperature for those living and working in corridor communities. Figure 2–42 presents recent heat island data produced as part of the City of Boston's Climate Ready Boston analysis, which did not assess such impacts on behalf of the City of Revere.

Figure 2–40. Permeable Cover Land along Study Corridor

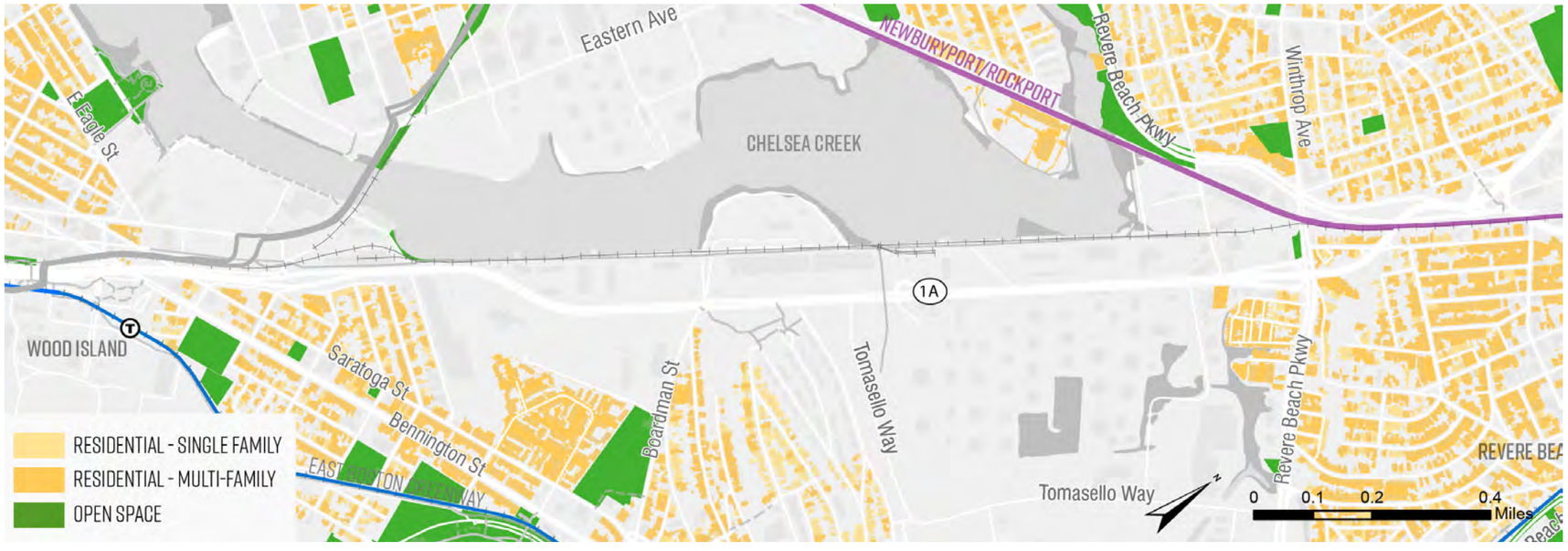


Figure 2–41. Open Spaces and Residential Area along Study Corridor

Figure 2–42. Urban Heat Island Effect along Study Corridor as Developed within Climate Ready Boston

Resilience Plans and Proposals

The previously-described Climate Ready Boston study and the Suffolk Downs Redevelopment project environmental filings both include resiliency elements (Figure 2–43). In the Climate Ready Boston study, two different strategies were proposed to deal with coastal flooding resulting from extreme weather and sea level rise. Both of these introduce elevated infrastructure (Figure 2–44). One involved creating a raised berm in the rail corridor while the other advanced raising Route 1A four to five feet in conjunction with the construction of a flood wall. The Suffolk Downs Redevelopment project proposed a raised berm along the rail corridor between Railroad Street and Tomasello Drive as a mitigation measure (Figure 2–45), but did not include that as a project-funded mitigation measure.

Figure 2–43. Previous Proposals to Use Rail Corridor or Route 1A for Flood Mitigation

Figure 2–44. Concepts for Creekside Flood Protection Using Route 1A or Rail Corridor (Climate Ready Boston

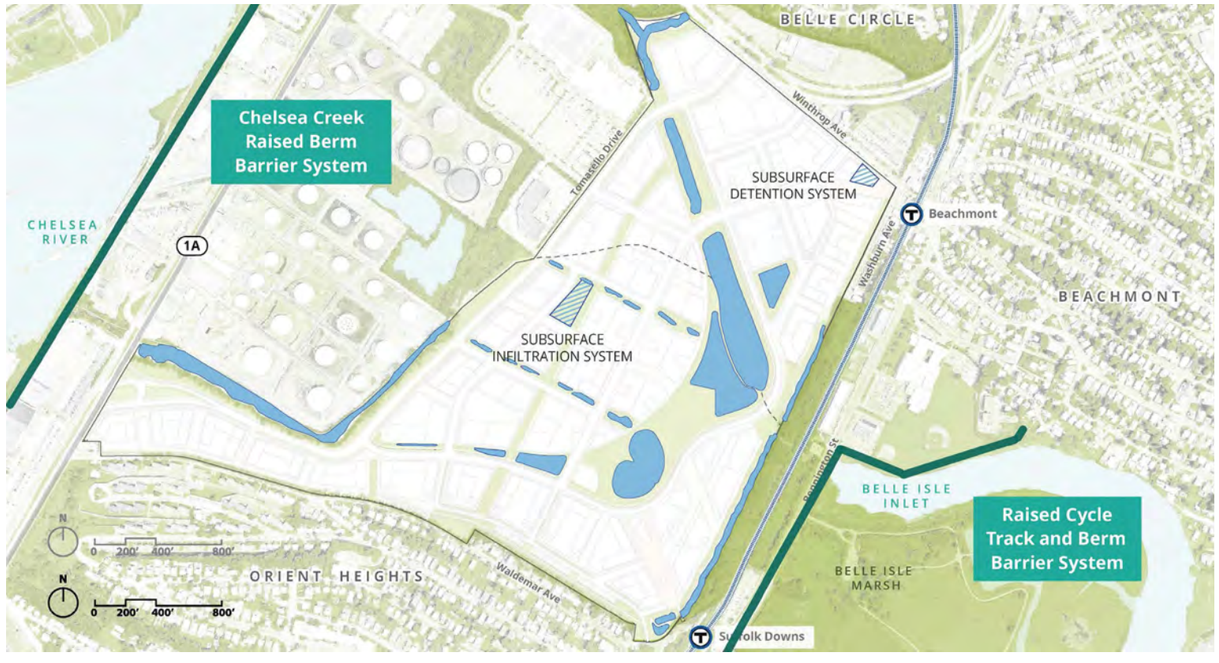


Figure 2–45. Unfunded Proposal for a Raised Berm Barrier System along the State-Owned Rail Corridor (HYM)

2.4.3. Environment, Sustainability, and Resilience Issues and Opportunities

Environmental Issues

- Numerous environmental issues challenge the corridor's potential long term transition
  - Multiple fuel distribution and storage facilities, as well as parcels where Activity Use Limitations have been established, lie adjacent to or along the rail ROW and Route 1A
  - The study corridor primarily lies within tideland areas governed by Chapter 91. As a result, the majority of physical changes to land along the corridor requires authorization from the Massachusetts Department of Environmental Protection, regardless of the extent to which the proposed use is water-dependent. Furthermore, since some of the Chapter 91 areas along the study corridor are also enclosed within the Chelsea Creek DPA (see Chapter 1), petitions for changes to the use of such lands will be subjected to stronger scrutiny by the Office of Coastal Zone Management if the use proposed is not water-dependent.[1]

Environmental Opportunities

- Visions already proposed for the redevelopment of the rail right-of-way by various stakeholders include use as active recreational and/or passive natural space.
  - The rail corridor has been envisioned as open recreational space, a passive linear park, and a multi-use trail location.
  - Community-based proposals have also proposed dedicating the rail ROW for the purposes of ecological restoration, complete with measures designed to improve resiliency in the face of impending climate change.

Resiliency Issues

- Flooding vulnerability along the corridor, notably the low-lying areas immediately north and south of the peninsula that spans from Boardman Street to Tomasello Way
  - With sea level rise and storm surge, flood pathways from Chelsea Creek reflect topography and history
    - North and south of Orient Heights neighborhood (historic "Hog Island")
    - Filled land that was open water in colonial times
  - Low-lying segments of Route 1A are prone to flooding via
    - Infiltration from Chelsea Creek
    - Inland precipitation (exacerbated by lack of permeable cover)
- Lack of public open space along the study corridor

Resiliency Opportunities

- Previous resiliency proposals put forward within Climate Ready Boston and the Suffolk Downs Redevelopment have proposed using the rail right-of-way and/or Route 1A as a flood mitigation component, including the following:
  - Raised road with flood wall (elevated and reinforced Route 1A)
  - Raised berm with ecological restoration (along the rail right-of-way)

1 As noted within the MassDEP guidance, water-dependent uses are defined as those that "require direct access to, or a location in, tidal water or great ponds and therefore, cannot be located away from the water's edge." In contrast, non-water-dependent uses are those that "do not require water for the structure or use to exist." Examples of water-dependent uses include but are not limited to: facilities which promote the public use and enjoyment of the waterfront, such as public parks, boardwalks, esplanades; flood, water level, or tidal control facilities; and industrial uses or infrastructure facilities which cannot reasonably be located at an inland site. In addition to traditional commercial facilities, non-water-dependent uses include "roads, causeways, railways, and other facilities for land-based vehicular movement, other than those found to be water-dependent." More detail on water-dependent uses can be found in 310 CMR 9.12 (2).

3. ALTERNATIVES DEVELOPMENT AND ANALYSIS

The alternatives analysis is the central component of the study's technical analysis. This section describes how the issues, opportunities and challenges identified in the last chapter were employed to develop specific study alternatives. The chapter then provides a thorough technical analysis of each alternative against the study's goals and objectives, as reflected through a broad range of evaluation criteria.

3.1. ALTERNATIVES DEVELOPMENT

Prior to developing the alternatives, it was necessary to define the key infrastructure and operational elements that have the potential to serve as differentiating features amongst a range of alternatives. Identifying distinguishing characteristics enables an assessment of each potential alternative's benefits, costs, and impacts. Since the primary focus of this study is the MassDOT / MBTA-owned rail right-of-way (ROW) lying between Chelsea Creek and Route 1A, the alternatives will center on its reconfiguration.

These key parameters comprise the following components:

- **Corridor Configuration.** The most critical differentiator for the study alternatives is the basic configuration of the MassDOT / MBTA-owned rail corridor:
  - Shared Use Path Only
  - Bypass Road with Shared Use Path

  These are the two main concepts for the reuse of the rail parcels. Although both of these options involve the presence of a shared use path running along the entire right-of-way, one also incorporates the presence of a parallel vehicular roadway, extending from the existing Martin A. Coughlin Bypass Road and reconnecting with Route 1A at a point farther north. The inclusion of the Bypass Road would alter the character of the shared use path compared with the Shared Use Path Only configuration, especially in width-constrained segments of the corridor (i.e., Addison Street to Boardman Street).
- **Corridor Usage.** The type of corridor usage and access is an important factor in determining facility design, facility access points, and how to evaluate the alternatives.
  - **Shared Use Path Only.** The Shared Use Path Only alternative would only be for use by pedestrians, bicyclists, and other small non-motorized vehicles.
  - **Bypass Road with Shared Use Path.** The use of the shared use path would be the same; the Bypass Road would be for use only by authorized vehicles. "Authorized vehicles" is expected to comprise primarily trucks, but it could also potentially include transit vehicles (e.g., MBTA buses, shuttle services), emergency vehicles, and/or taxi/livery/transportation network company (TNC) vehicles.
- **Access Points.** Addison Street, Boardman Street, and Railroad Street are currently the only locations offering at-grade pedestrian access from Route 1A to the rail ROW. Other potential pedestrian access points have been suggested at Curtis Street, Winthrop Avenue, and Tomasello Drive (the new alignment of Tomasello Way). No new pedestrian

access points have been suggested for locations where there is not an existing intersection of an east-west road with Route 1A. Different locations for the Bypass Road's northern terminus were screened, but the location north of Tomasello Drive was ultimately chosen given the presence of existing infrastructure. The jughandle provides roadway infrastructure that is designed for large trucks, and is well-suited to connect to a new Bypass Road along the railroad corridor. The existing traffic signal at the jughandle already serves to facilitate vehicular connections to Route 1A northbound and across Route 1A, connections that meet the needs of the Bypass Road.

- **Route 1A Mainline and Intersection Design.** The Suffolk Downs Redevelopment project has undertaken a comprehensive project impact and mitigation planning process, which entails significant improvements to Route 1A and intersections in the study area. Given the extensive agency coordination and public process related to these improvements, this study generally respects these proposals and does not advance major changes to the highway, especially in the segment closest to the project. However, this study does propose certain refinements and enhancements at specific intersections. These include changes that are related to pedestrian and bicycle access and safety, which are particularly relevant to this study.
- **Access to Waterfront.** A shared use path along the corridor would fulfill a number of the project's goals and objectives. It would provide new open space and opportunities for active and passive use of the waterfront by residents and visitors, as well as walking and bicycling mobility and network connectivity.
- **Climate Resilience Features.** The rail ROW is adjacent to Chelsea Creek at two critical flood pathways for the East Boston and Revere communities, and it represents an important opportunity for integrating flood protection and resilient infrastructure. Berms, waterfront landscaping, and restored floodplain could potentially be accommodated by improvements in the railroad corridor.
- **Corridor Constraints.** These include the following:
  - **Width.** The width of the right-of-way varies across its length. At its widest, it is 85 feet while at its narrowest, between Boardman Street and Addison Street, it is between 25 and 42 feet. Near its southern end, it is approximately 30 feet wide. While such varying ROW widths would be able to accommodate a shared use path, a two-way roadway facility and a shared use path would not be able to be contained within it. Past proposals, which have included a bypass road and shared use path, have noted that at narrow ROW points, a parallel path structure would need to be constructed over Chelsea Creek while a bypass road would use the parcels.
  - **Active Industrial Uses.** Presently, there is limited accessibility to the rail parcels due to the presence of active industrial and commercial uses along Route 1A.
  - **Grade Change.** Portions of the rail ROW are located at lower elevations than Route 1A and its adjacent land uses. Any new infrastructure would need to address grade changes by raising or lowering the grade of the facility, or by providing a vertical connection between grade-separated facilities.

As shown in Figure 3–1 and Figure 3–2 below, the study investigated a range of preliminary alternatives for reactivating use of the rail ROW, ranging from

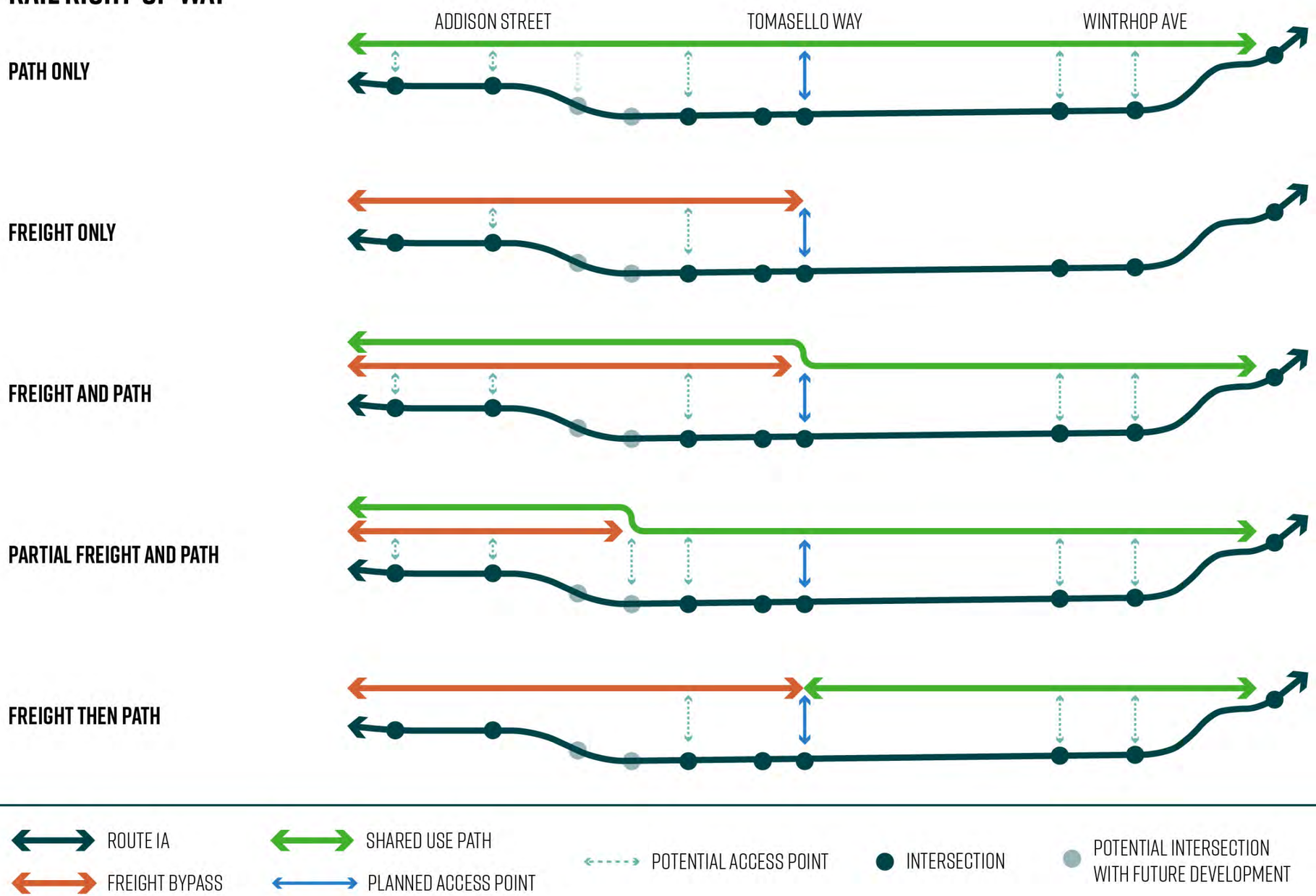
- Exclusive, corridor-wide uses (i.e., Shared Use Path Only)
- Mixed but geographically-distinct uses (i.e., Bypass Road Then Shared Use Path) and
- Variations on combined, overlapping uses (i.e., Partial Bypass Road with Shared Use Path to Tomasello Way, Bypass Road with Shared Use Path, with Bypass Road extending north to Railroad Street)

In developing options for changes to Route 1A, the roadway was assessed using a two-prong framework summarized in Figure 3–3 – Regional Mobility Corridor versus Urban Multimodal Corridor. Aside from the regionally significant role that Route 1A plays as the primary approach to Logan International Airport for those coming to/from the north, the Urban Multimodal Corridor approach was screened out of further consideration for two primary reasons:

1. Challenges related to the transition from expressway facility to more urban multimodal facility, especially in consideration of high proportion of heavy vehicles, steep slopes, and stopping distance
2. Establishment of Section 61 findings for the Suffolk Downs redevelopment

The operational and geometric constraints are most prominent at the southern end of the study corridor where the Bennington – Saratoga overpass, which unites the "interstate" end of the facility further south near the airport with the "highway" end Route 1A near Curtis Street, produces a long and relatively steep slope. The application of traffic calming strategies in such

RAIL RIGHT-OF-WAY



a transitional and geometrically-challenging area where trucks will undoubtedly continue to play a role into the future has the potential to create safety concerns.

Furthermore, the Section 61 mitigation commitments for Suffolk Downs, which were vetted with the MassDOT Highway Division in coordination with the City of Boston, City of Revere, and other stakeholders, represent well-defined consensus design guidance for Route 1A into the near- and mid-term. Therefore, this study primarily focuses on improvements to Route 1A at locations where the proposed Shared Use Path would interface with the public ROW.

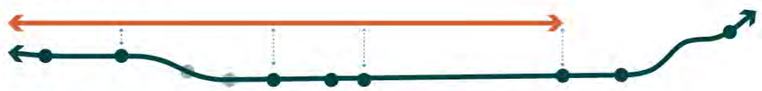
Figure 3–1. Preliminary Mainline Alternatives Showing Two Potential Termini for a Bypass Road (Tomasello Way and Railroad Street)

RAIL RIGHT-OF-WAY

PATH ONLY

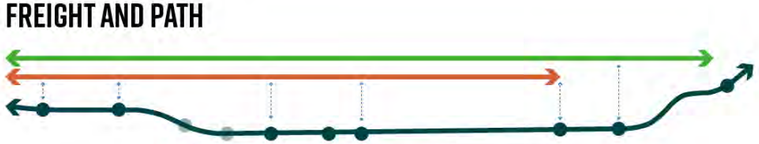
- Can be contained within right-of-way, which will limit environmental impacts
- Can be combined with resiliency features (berm, etc.)
- Limits conflicts at access points
- Provides greater flexibility for community use and active/passive recreation areas

FREIGHT ONLY



- Can be contained within right-of-way, which will limit environmental impacts
- Limited ability to combine with resiliency features
- Limits conflicts at access points
- Emphasizes need for multimodal connections on Route 1A
- Potential connections to existing plaza and Suffolks Downs via Raillroad Street

FREIGHT AND PATH



- Requires cantilever for narrowest section of ROW
- Portion of ROW can be combined with resiliency features
- Complicates and introduces conflicts at access points

PARTIAL FREIGHT AND PATH

- Requires cantilever for narrowest section of ROW
- Portion of ROW can be combined with resiliency features
- Complicates and introduces conflicts at access points

FREIGHT THEN PATH

- Can be contained within right-of-way, which will limit environmental impacts
- Portion of ROW can be combined with resiliency features
- Fewer conflicts at access points to the path

ROUTE 1A
FREIGHT BYPASS
SHARED USE PATH
POTENTIAL ACCESS POINT

ROUTE 1A CORRIDOR STUDY

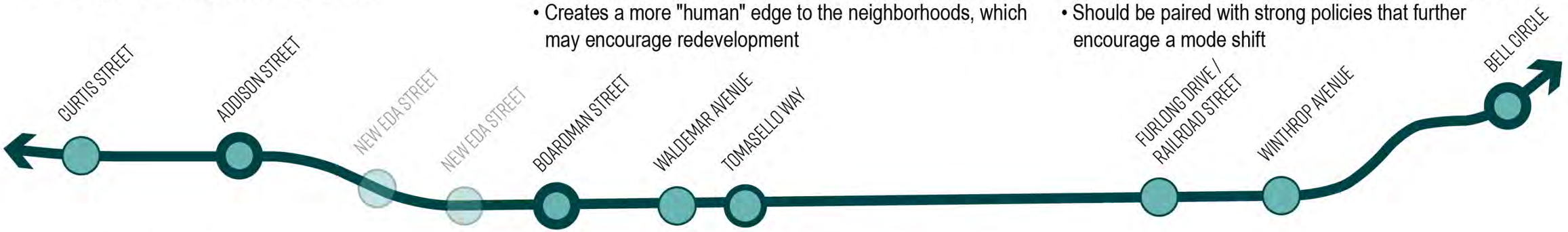
Figure 3–2. Pros and Cons of Preliminary Mainline Alternatives

URBAN MULTIMODAL CORRIDOR

CHARACTERISTICS
- Designed for slower speeds via
  - More porous street network
  - More signals that are more evenly-spaced

PRIMARY BENEFITS
- Expands person capacity and more comfortably accommodates multiple modes
- Offers more frequent natural connection points to rail ROW
- Creates a more "human" edge to the neighborhoods, which may encourage redevelopment

PRIMARY CONSIDERATIONS
- Reduces vehicle capacity, need to assess traffic impacts
- Does not align with Suffolk Downs' mitigation
- May make a stronger case for freight uses in rail ROW
- Should be paired with strong policies that further encourage a mode shift



REGIONAL MOBILITY CORRIDOR

CHARACTERISTICS
- Designed for higher speeds via
  - Limited access points
  - Fewer signals, inconsistent spacing

PRIMARY BENEFITS
- Maximizes vehicle throughput
- Least disruptive to existing operations
- Aligns with Suffolk Downs' mitigation commitments

PRIMARY CONSIDERATIONS
- Focus on vehicle throughput inconsistent with long-term goals
- Maintains barrier between neighborhoods and impacts quality of life
- Limited ability to safely accommodate multiple modes
- May make a stronger case for active (non-freight) uses in rail ROW

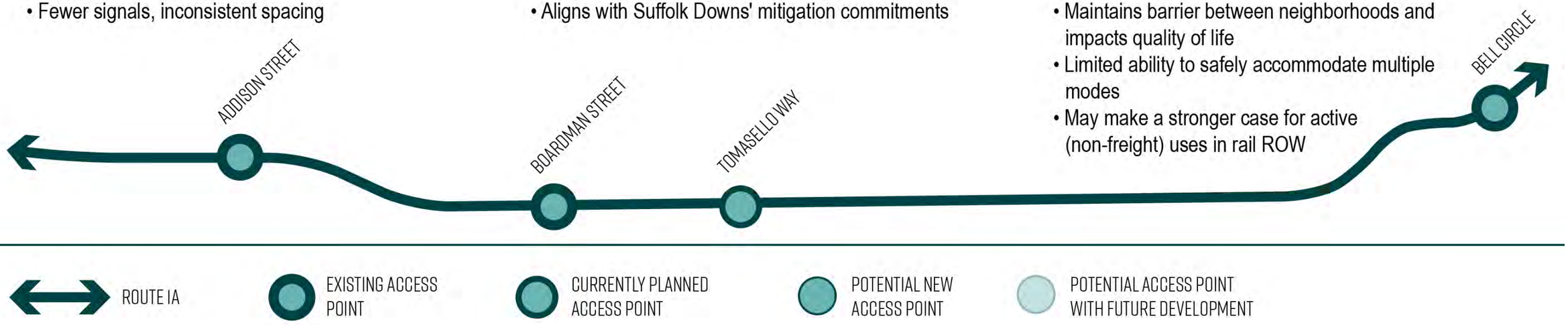


Figure 3–3. Conceptual Approaches to Developing Corridor Alternatives

3.2. DESCRIPTION OF ALTERNATIVES

This section provides a thorough description of each of the study alternatives. The alternatives divide the study corridor into three primary parts. The northern and southern segments each feature two alternative approaches for improving connections. Within the central segment that links the two ends, a single alternative is proposed. From south to north, these segments are:

- Curtis Street – Jughandle/Tomasello Drive
  - Alternative 1 – Shared Use Path Only
  - Alternative 2 – Bypass Road with Shared Use Path
- Jughandle/Tomasello Drive – Winthrop Avenue
  - Single alignment for Shared Use Path
- Winthrop Avenue – Bell Circle
  - Option A – On-Street via Harris Street and Beach Street
  - Option B – Shared Use Path via Revere Beach Parkway Ramp

The different alternatives for the northern and southern segments all have common beginning and ending points, have independent utility, and can be paired with any other options. The choice of alternative for the northern segment does not have any impact on the southern segment, and vice versa.

3.2.1. Curtis Street – Jughandle/Tomasello: Alternative 1 – Shared Use Path Only

The first alternative for the southern segment of the corridor, from Curtis Street to the jughandle/Tomasello Drive intersection, entails the creation of a Shared Use Path.

Curtis Street to Addison Street

Beginning at the southern extent of the study corridor, the Shared Use Path Only Alternative would provide comfortable walking and biking connections between Day Square, the Chelsea Street Bridge, and the rest of the Route 1A study corridor (Figure 3–4).

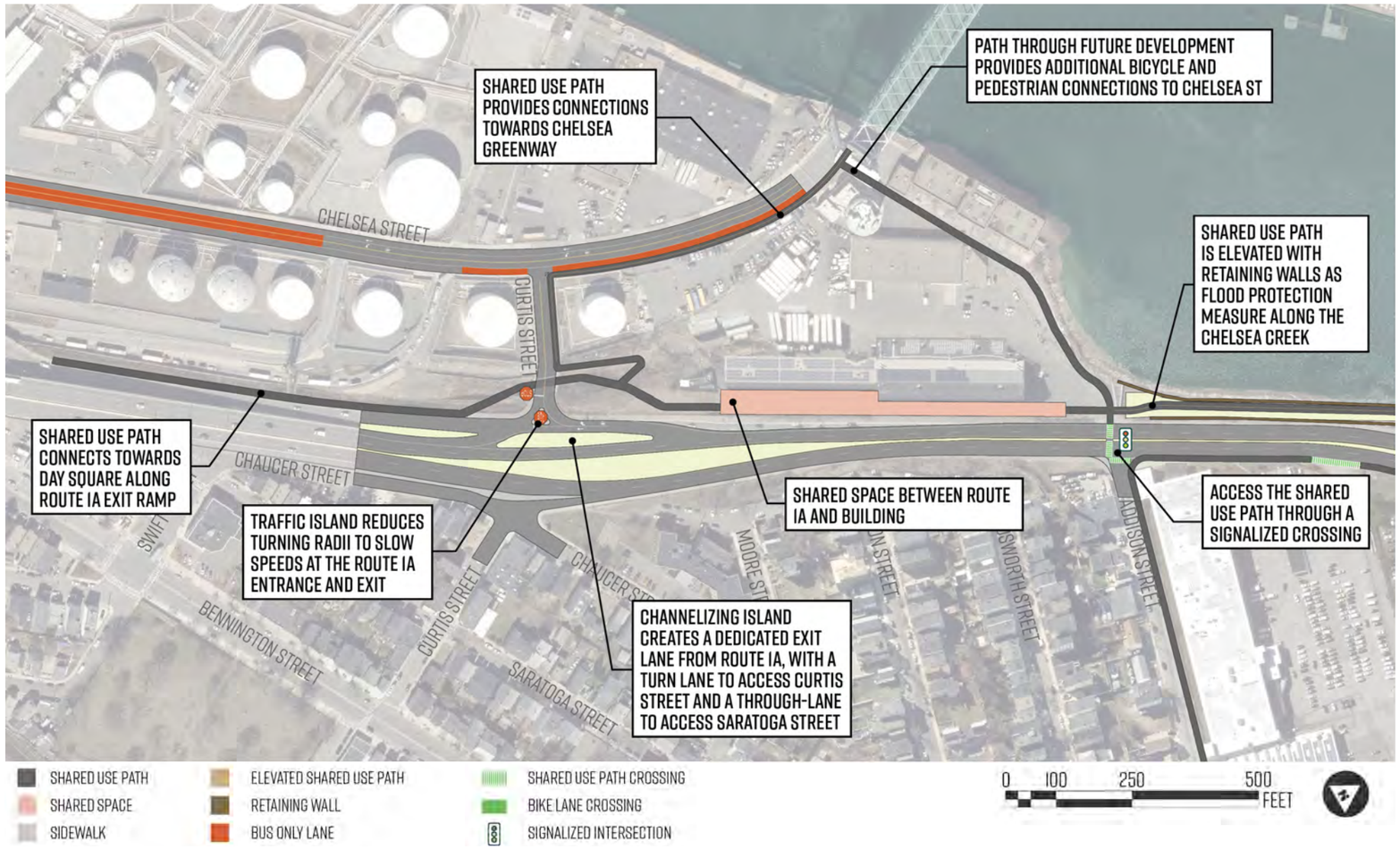


Figure 3–4. Shared Use Path Only – Curtis Street to Addison Street

South of the Curtis Street bridge, this study's proposed Shared Use Path would terminate at PLAN: East Boston's proposed extension of the Mary Ellen Welch Greenway. That planned link would connect southward from the Curtis Street – Route 1A intersection along the southbound Route 1A off-ramp. It would enable those walking and biking to make connections into Day Square, as well as to Swift Street and Saratoga Street.

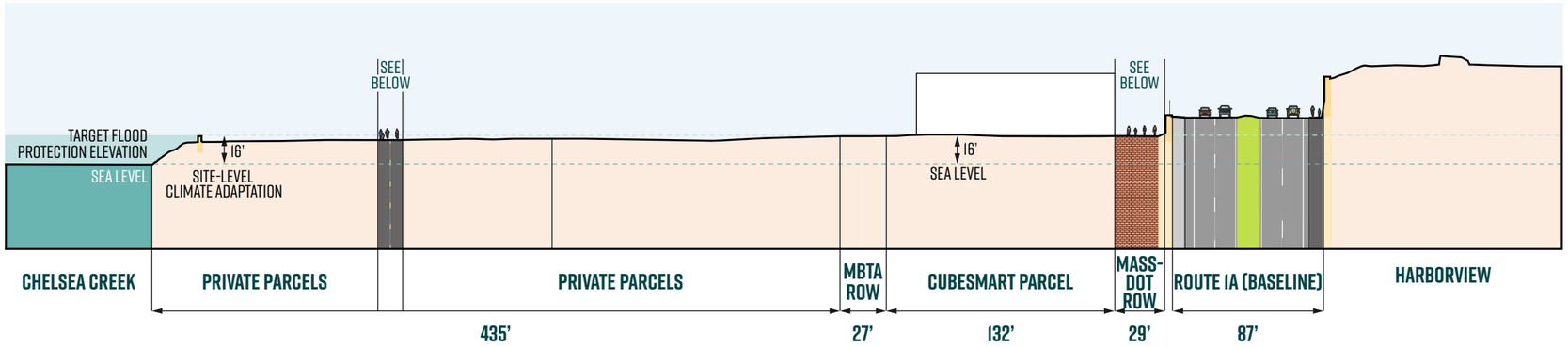
Heading north from the planned Greenway extension, the Shared Use Path would transition away from Route 1A, down into the existing rail right-of-way and beneath the Curtis Street bridge to provide a grade-separated crossing for the new facility. Compared to an at-grade crossing of a new path at Curtis Street, an underpass would reduce conflict points at the intersection

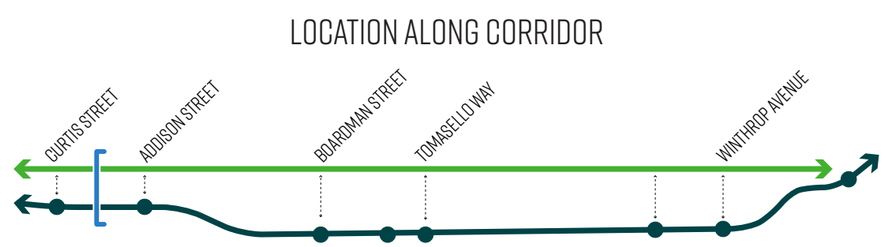
while minimizing impacts to southbound vehicles.

As discussed in Chapter 2, the Curtis Street / Route 1A intersection has a history of severe and fatal crashes, and significant design deficiencies relative to safety. The Suffolk Downs Redevelopment mitigation program includes a general proposal for safety improvements at this intersection. Both alternatives for this study would entail a reconfiguration of this intersection to improve safety. As in the existing condition, Route 1A would have In Alternative 1, those lanes would be realigned into the existing median to allow for the construction of an off-ramp with space for vehicle deceleration and queuing in advance of Curtis Street. The off-ramp would have two lanes: one to proceed to Saratoga Street along the existing ramp and one to turn right on to Curtis Street. In Alternative 1, with the Shared Use Path passing beneath the Curtis Street bridge, this intersection could potentially be unsignalized, with all-way stop control for the Route 1A southbound off-ramp and Curtis Street eastbound approaches, though a signal warrant analysis should be undertaken to determine appropriate signal control.

Just north of Curtis Street, path users would then be able to either connect to the Chelsea Street bridge via a new accessible ramp or continue to the northeast along the study corridor through a landscaped area. The Shared Use Path would extend across the Curtis Street bridge on a reconstructed and widened sidewalk, then to Chelsea Street, where bicyclists and pedestrians could make connections to the Chelsea Street bridge and into Chelsea.

Between Curtis and Addison Streets, the right-of-way briefly narrows from 50 to 30 feet, creating a 300-foot long pinch point where the CubeSmart building protrudes towards the Route 1A retaining wall and the landscaped buffer disappears.





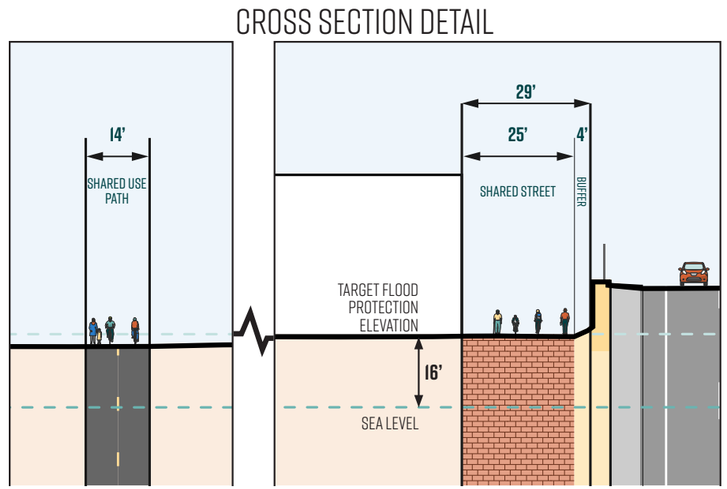


Figure 3–5. Shared Use Path Only – Curtis to Addison Street

In this severely constrained segment from Curtis to Addison Streets, the new facility would take the form of a "shared street" between the CubeSmart building to the west and the Route 1A retaining wall (Figure 3–5), where path users would need to share space with low-speed vehicles accessing CubeSmart storage units. Near Addison Street, Cargo Ventures previously proposed pedestrian and bicycle access improvements that would allow for a more direct, less vertically challenging pathway between Route 1A and the Chelsea Street Bridge. As shown in Figure 4, that proposed connection would run along the edge of Chelsea Creek and through a Cargo Ventures-owned parcel (605 Chelsea Street), and end immediately before the drawbridge gates at Chelsea Street. Given that this study proposes a new Shared Use Path west of the roadway corridor and the Suffolk Downs mitigation includes a shared use path on the east side of Route 1A from Addison Street to Tomasello Drive, additional safety measures would be needed at the intersection opposite Addison Street. To provide safer walking and biking connections across Route 1A at Addison Street, a pedestrian signal would be needed. A signal warrant analysis should be conducted to determine the appropriate type of signal control (e.g., High-Intensity Activated Crosswalk, or HAWK, signal or full traffic signal control).

Addison Street to Boardman Street

Just north of Addison Street, Route 1A bends to the east while the rail corridor continues due north, with Chelsea Creek located immediately to the west and industrial parcels situated to the east (Figure 3–6). This section of the corridor is particularly vulnerable to climate change-induced flooding (as previously shown in Figure 2–39). Climate Ready Boston, the City of Boston's plan to prepare for the impacts of climate change, has identified the rail right-of-way between Addison Street and Boardman Street as a priority location for nature-based solutions and a raised berm (as depicted in Scenario 2 of Figure 2–44). While there are some constrained dimensions for implementing mitigation and resiliency in this alternative, especially just north of Addison Street, Alternative 1 would provide some opportunity for creation of an earthen berm on top of which the raised Shared Use Path could be located.

Along this waterfront segment between Addison Street and Boardman Street, the proposed facility would provide flood protection benefits in the form of a filled seawall section that raises the new facility six feet above present elevations (i.e., to an absolute elevation of 16 feet). Bounded by five-foot wide seawall / retaining wall edges, the new facility would accommodate a relatively wider Shared Use Path with an ample greenspace buffer separating the path from either Route 1A or adjacent industrial uses (Figure 3–7).

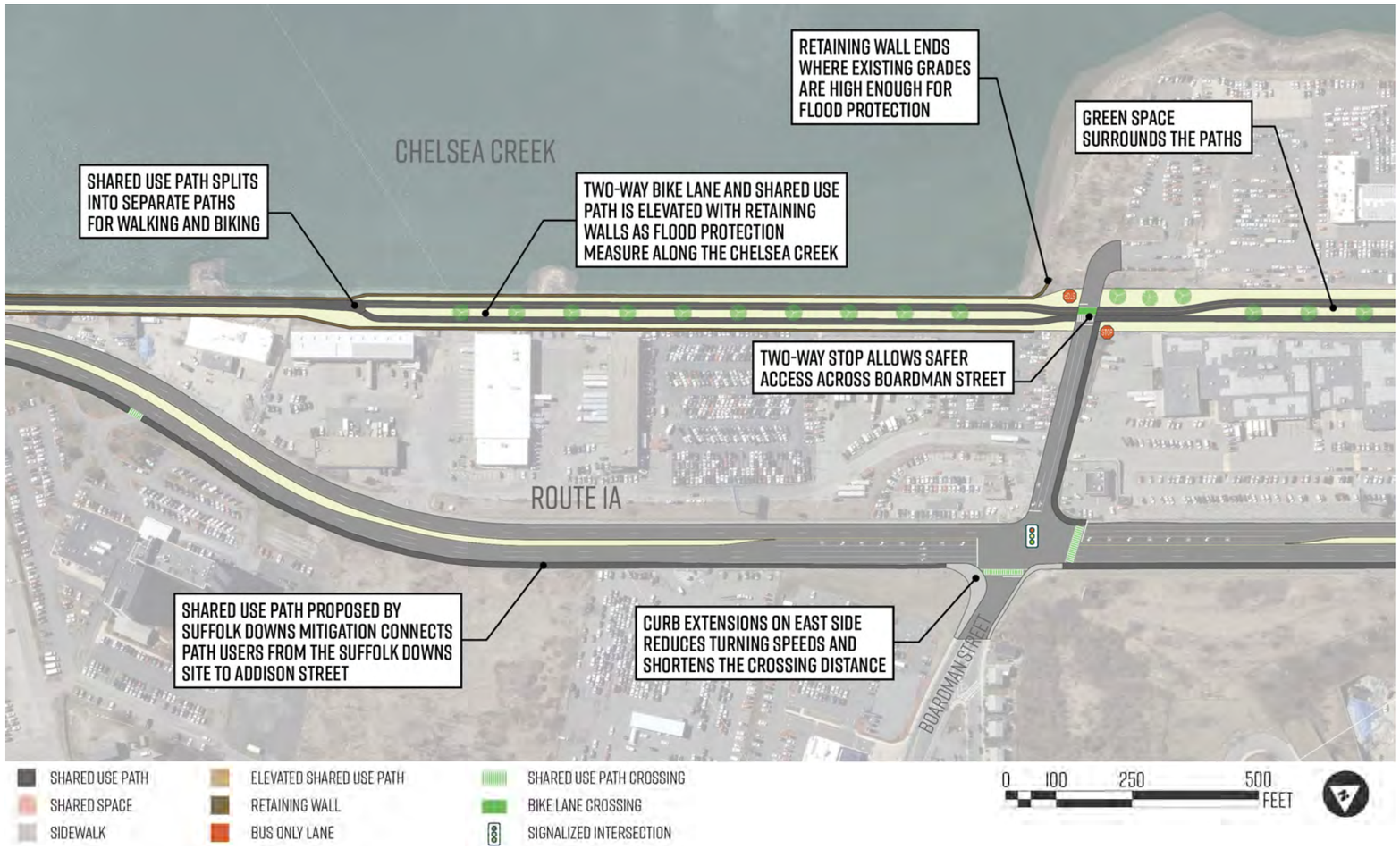
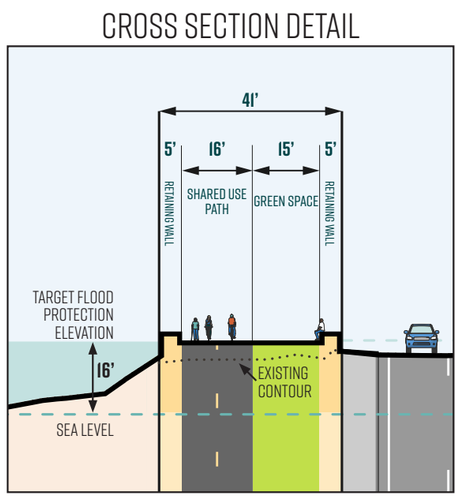
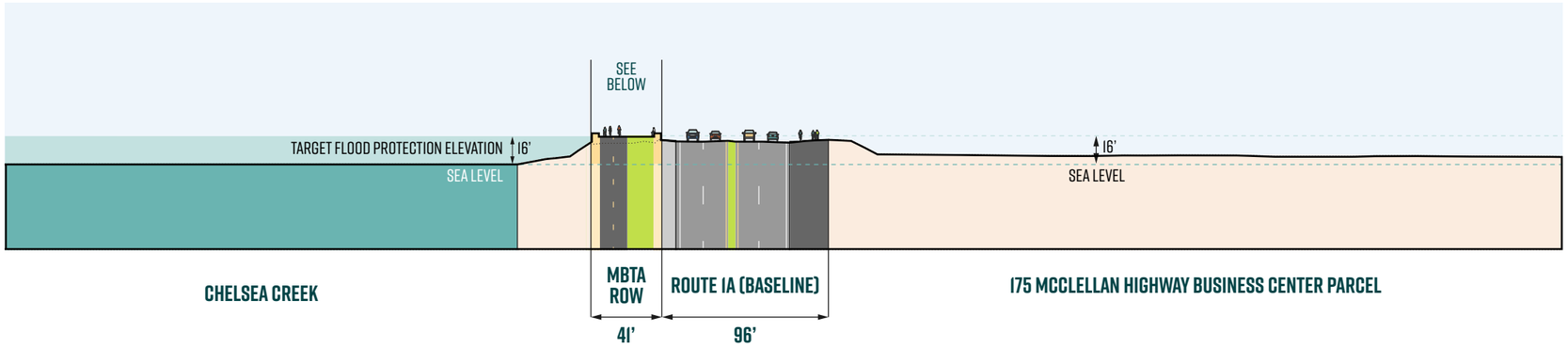


Figure 3–6. Shared Use Path Only – Addison Street to Boardman Street





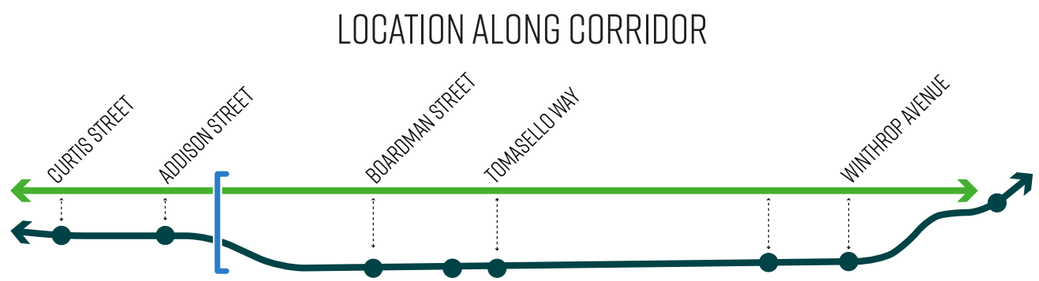


Figure 3–7. Shared Use Path Only – North of Addison Street

Since the railroad corridor is situated between the creek and the rear of the adjacent parcels (where vehicular access ends at or before the parcel lines), and bounded by wall sections, there would be little to no risk of conflicts between path users and Route 1A vehicles in this segment.

At a location near the Route 1A curb cut at 230 McClellan Highway, the available right-of-way widens to the north. Within this more generous segment, this alternative would typically often have sufficient width to separate bicycles and pedestrians into distinct walking and biking paths, with additional area for green space (Figure 3–7). This wider segment could provide adequate width for a gentler sloping berm, with a lower seawall, which would provide a more natural edge along Chelsea Creek; however, this would come at the expense of some of the linear park width.

Boardman Street to Jughandle

The bridge underpass at Boardman Street is a pinch point in both alternatives. There is limited width available between the supports to comfortably accommodate a Shared Use Path beneath the existing structure, especially one that maintains separate streams of walking and biking traffic. Additionally, due to the steep topography of the area, path users would be traveling through a depressed corridor, which has the potential to reduce user comfort and may raise broader personal safety and security concerns relative to the proposed facility.

As a result, both alternatives propose elevating the rail corridor to cross the Boardman Street bridge at grade (Figure 3–8). Aside from allowing for a Shared Use Path that accommodates separated walking and biking paths and green space buffers (Figure 3–9), extending this fill-to-elevate approach from Boardman Street northward would match the flood mitigation elements proposed at a key low-lying portal of entry located between Tomasello Drive and the jughandle.

Absent the proposed change in ground elevation, the bridge at Boardman Street would likely need to be reconstructed in order to widen the underpass and bridge deck to facilitate robust non-motorized connections. A land taking may be necessary to create an ADA-compliant access point between the low-lying Shared Use Path and the elevated Boardman Street.

To address potential conflicts between Boardman Street vehicles and users of the proposed path, new two-way vehicular stop control would be introduced at their interface.

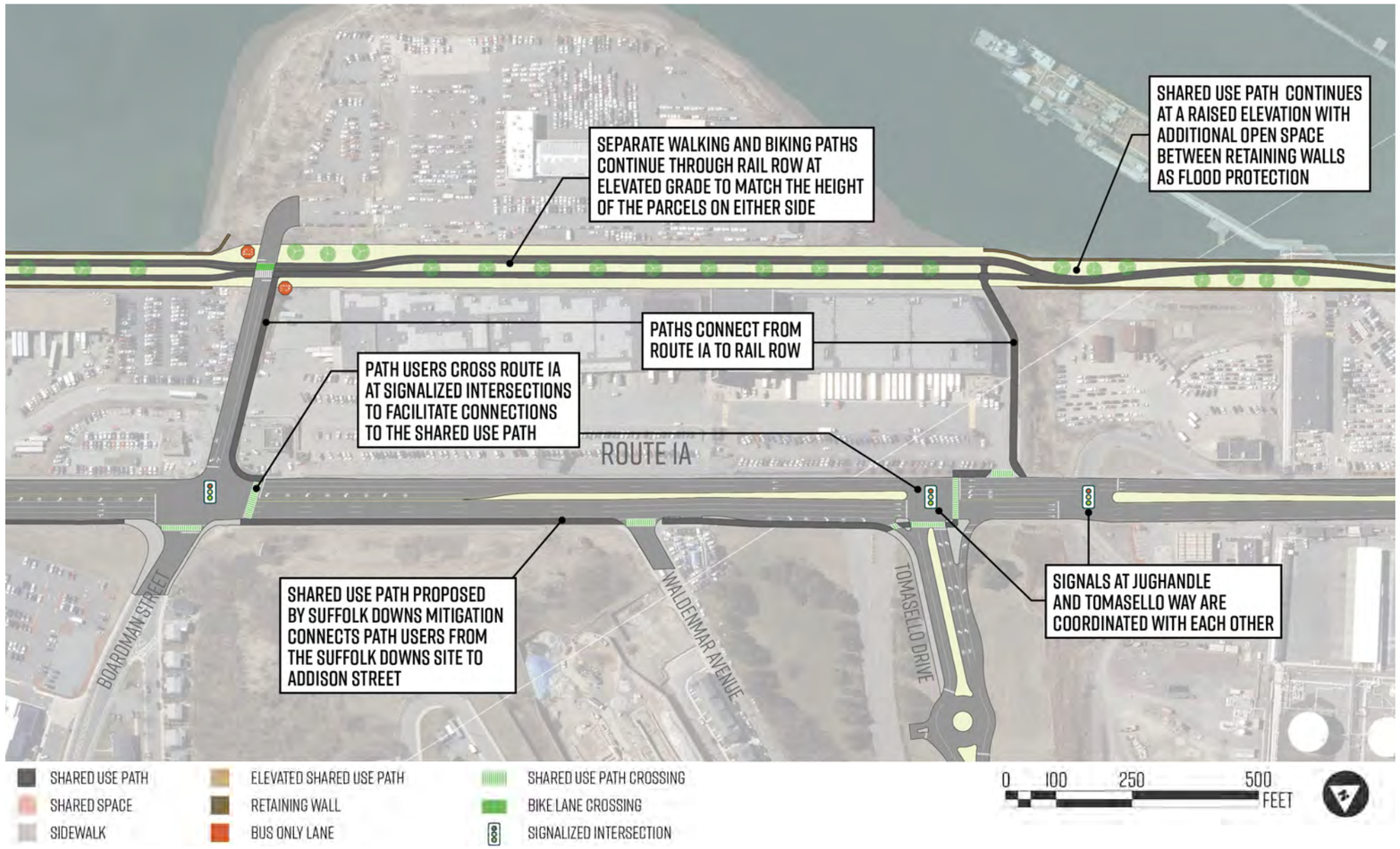
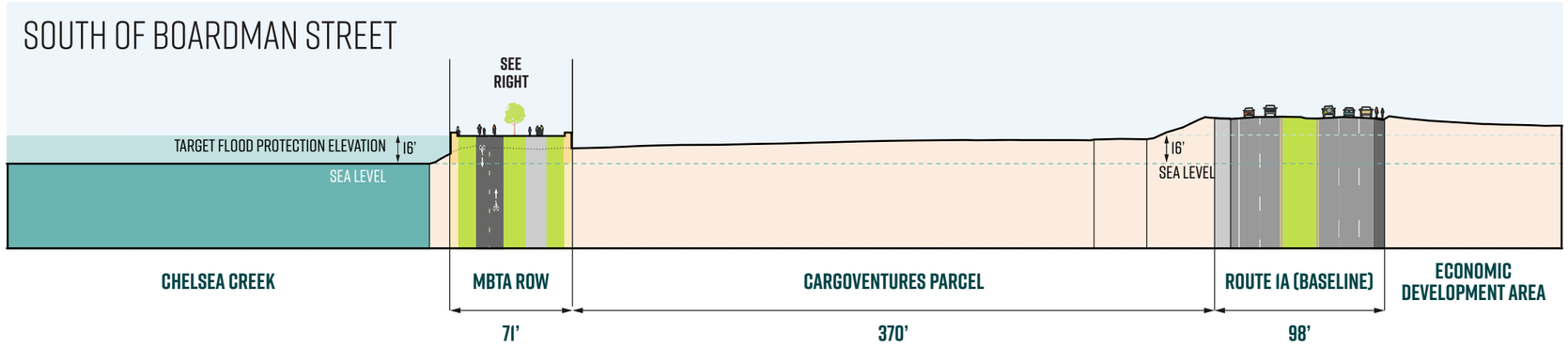
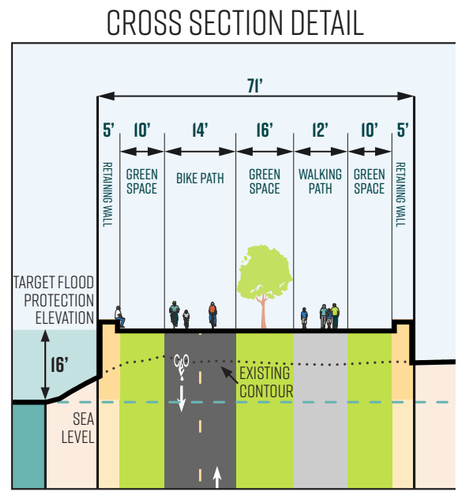


Figure 3–8. Shared Use Path Only – Boardman Street to Jughandle



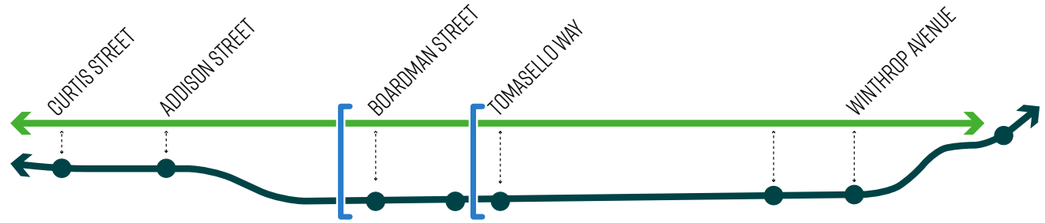


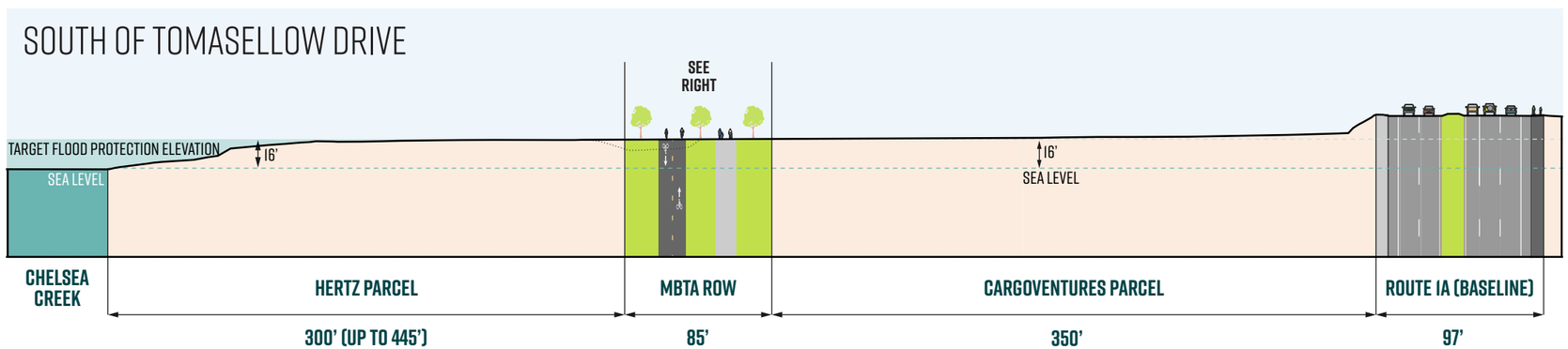
A new path segment leading east from the proposed path along the north side of Boardman Street to the signalized intersection at Route 1A would create an access point to serve pedestrians and cyclists connecting between the new facility and the planned shared use path on the east side of Route 1A (Suffolk Downs mitigation).

Anticipating Suffolk Downs' adjustments to Tomasello Way to create the new Tomasello Drive, the new Shared Use Path facility would connect to the public right-of-way just south of the jughandle via a new path segment along the northern edge of 480 McClellan Highway that leads to the northern leg of the reconfigured Route 1A intersection.

Responding to the long-term demand for comfortable connections between the planned and proposed facilities, high-visibility bike crossing pavement markings (elephant's feet) would be installed along the northern legs of the intersections of Route 1A at Boardman Street and Tomasello Drive.

LOCATION ALONG CORRIDOR





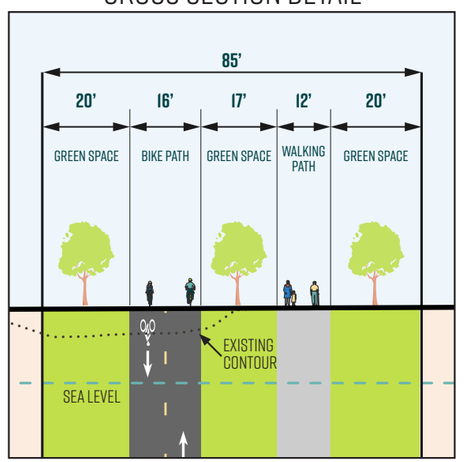


Figure 3–9. Shared Use Path Only – South of Boardman Street & South of Tomasello Drive

3.2.2. Curtis Street – Jughandle/Tomasello: Alternative 2 – Bypass Road with Shared Use Path

The second alternative for the southern segment of the corridor, from Curtis Street to the jughandle/Tomasello Drive intersection, entails the creation of a Bypass Road with a Shared Use Path. The Bypass Road would be available for the use of trucks and other authorized vehicles (e.g., transit vehicles and emergency vehicles). It would provide a separated roadway connection between the existing Martin A. Coughlin Bypass Road, which provides access to Logan International Airport's internal roadway network, and Route 1A in the vicinity of the existing jughandle connection and the proposed Tomasello Drive intersection.

The study evaluated three different options for the northern terminus of the Bypass Road: Boardman Street, Jughandle/Tomasello Drive, and Railroad Street. It was determined that the connection to the Jughandle/Tomasello Drive has the following benefits:

- The existing jughandle connection provides space and appropriate roadway geometry for truck connections (better than Boardman Street, which is a relatively tight 90-degree intersection).
- The existing jughandle intersection provides access both from the north and to the north on Route 1A; this is not true of Railroad Street, which has connections only from the Route 1A southbound on-ramp from Winthrop Avenue.

Curtis Street to Addison Street

In addition to a Shared Use Path, Alternative 2 would introduce a Bypass Road in the rail ROW to facilitate freight movement to and from parcels adjacent to Route 1A (Figure 3–10).

At the southern end of the corridor, the proposed Bypass Road would interface with the Coughlin Bypass Road. The proposed Shared Use Path would connect to a planned extension of the

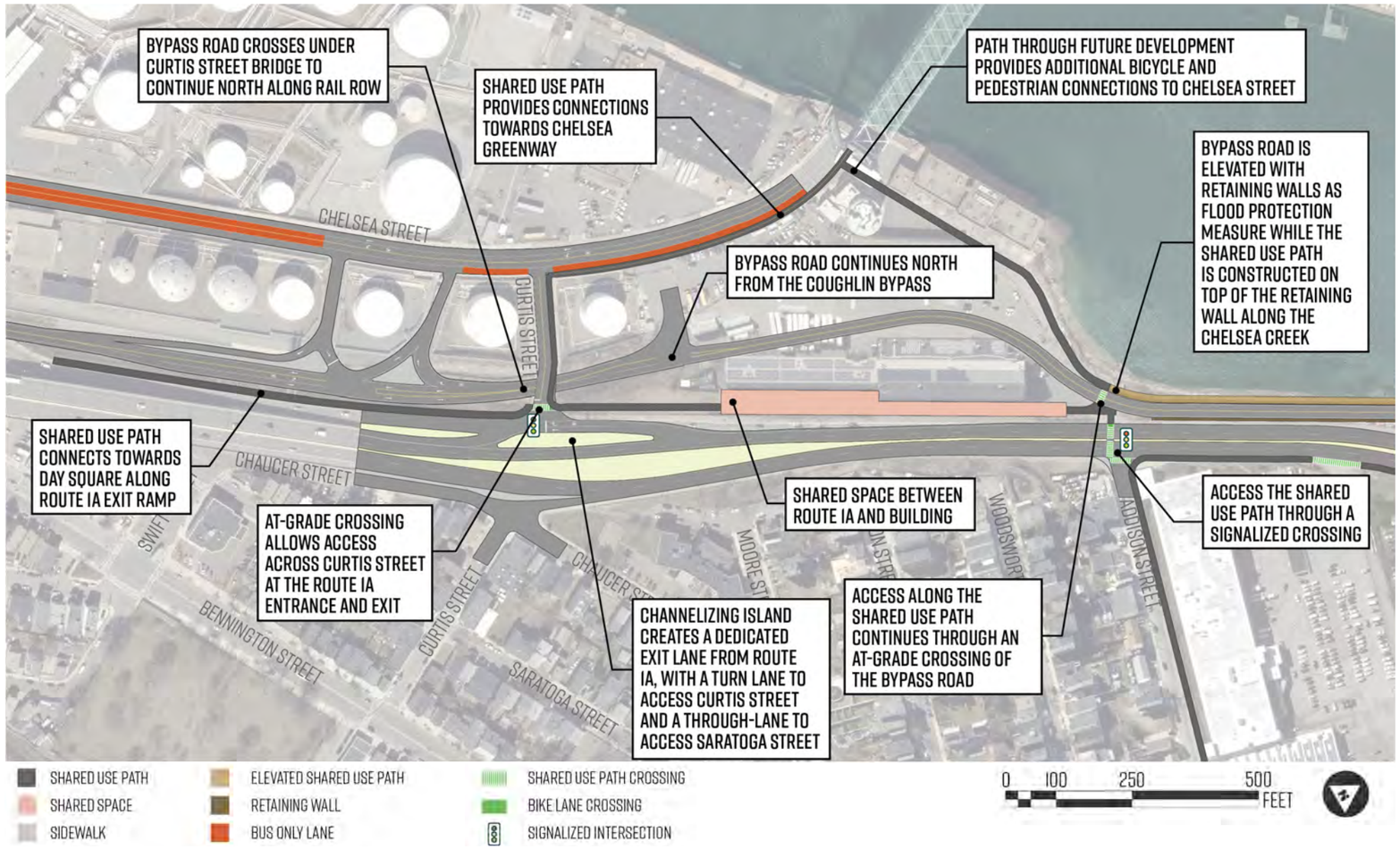


Figure 3–10. Bypass Road with Shared Use Path (SUP) – Curtis Street to Addison Street

Mary Ellen Welch Greenway, utilizing the existing Saratoga Street Route 1A off-ramp, which will have sufficient dimension to safely accommodate both a buffered Shared Use Path and vehicular traffic exiting Route 1A. This key connection would allow pedestrians and cyclists a direct link from the proposed shared use path to Day Square.

Given the limited width available between the existing abutments of the Curtis Street Bridge, the underpass in Alternative 2 could only be used by vehicles operating along the proposed Bypass Road, and it would not provide adequate width for the Shared Use Path as well. In this alternative, the Shared Use Path would need to run on a separate alignment and would cross Curtis Street at grade. This would entail a reconfiguration of the intersection of Curtis Street and Route 1A, similar to the safety improvement proposed in Alternative 1 – the two-lane southbound Route 1A mainline would be realigned into the existing

median to allow for the construction of a southbound off-ramp with two lanes (one through lane towards the Saratoga Street off-ramp and a right-turn lane towards Curtis Street).

However, introducing an at-grade Shared Use Path crossing at Curtis Street would introduce higher volumes of pedestrians, bicyclists, and other vulnerable road users at this intersection with significant heavy vehicle traffic. In this condition, a traffic signal would enable signal-protected crossings for path users. Shared Use Path travelers would be able to make an at-grade connection to the Curtis Street Bridge, unlike in Alternative 1 where they would have to use a ramp connecting the bridge and the Shared Use Path.

As in Alternative 1, the Shared Use Path would have a spur consisting of a reconstructed and widened sidewalk on the Curtis Street Bridge connecting to Chelsea Street from which bicyclists and pedestrians would be able to access the Chelsea Street bridge and Chelsea.

North of the Curtis Street intersection, the Shared Use Path would continue along the same alignment as in Alternative 1 (Figure 3–11), including the shared street. On the opposite (west) side of the CubeSmart building from the path, the proposed Bypass Road would use a curved MassDOT-owned parcel to move between the Curtis Street underpass and the path-bypass junction near Addison Street. The Bypass Road would also feature access to and from the CubeSmart parking lot.

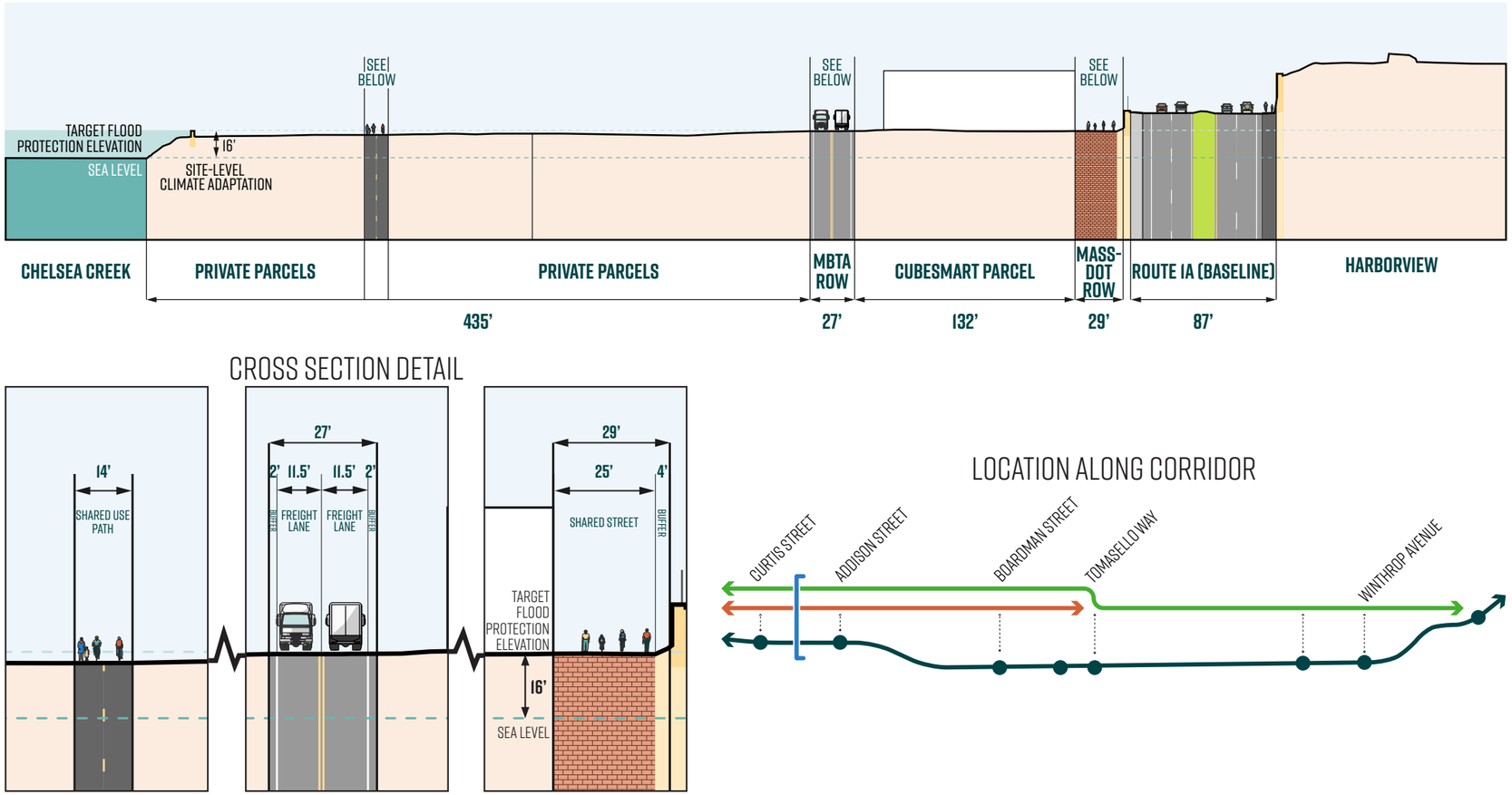


Figure 3–11. Bypass Road with Shared Use Path (SUP) – Curtis Street to Addison Street

Under Alternative 2, the intersection opposite Addison Street has the potential to become a conflict point given that the Shared Use Path, which runs on the east side of the Bypass Road south of this point, would need cross the Bypass Road to connect to the northern portion of the shared used path. To help mitigate potential conflicts, a new HAWK signal is proposed to cross the Bypass Road (Figure 3–10). From this point, path users could connect to the Chelsea Street Bridge (via the potential connection proposed by Cargo Ventures at 605 Chelsea Street described in Alternative 1) or continue along the proposed path northward toward Boardman Street, the jughandle, Railroad Street, and, ultimately, Bell Circle. It is worth noting that the potential Cargo Ventures waterfront link between Chelsea Street and Addison Street would provide an alternative to Shared Use Path users seeking to avoid such a conflict.

Addison Street to Boardman Street

North of the intersection at Addison Street, the rail ROW becomes more constrained (Figure 3–13). To accommodate both a Shared Use Path and a Bypass Road through this section, the Shared Use Path would need to be constructed cantilevered extending from a seawall. A limited horizontal buffer and a slight change in elevation would serve to separate the Shared Use Path from the Bypass Road.

The Bypass Road would have direct access to the parcels at 230, 240, 290 and 310 McClellan Highway, all of which are slated for possible redevelopment. In the northbound direction, a slip lane would allow traffic to exit the Bypass Road to the parcels, while in the southbound direction, a left-turn lane would be included on the Bypass Road to provide parcel access (Figure 3–12). The left-turn lane would end near the northern edge of the 310 McClellan Highway parcel.

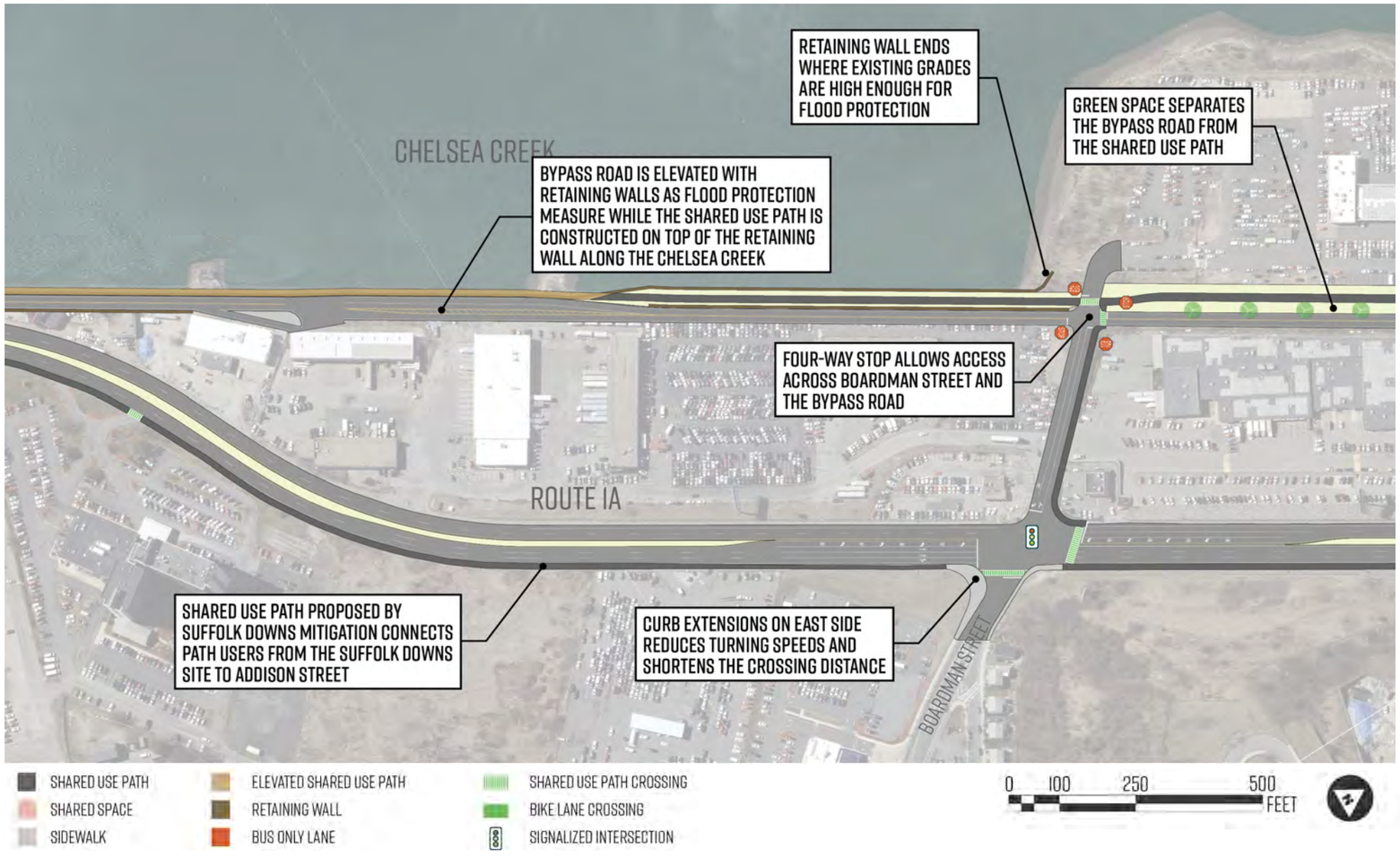
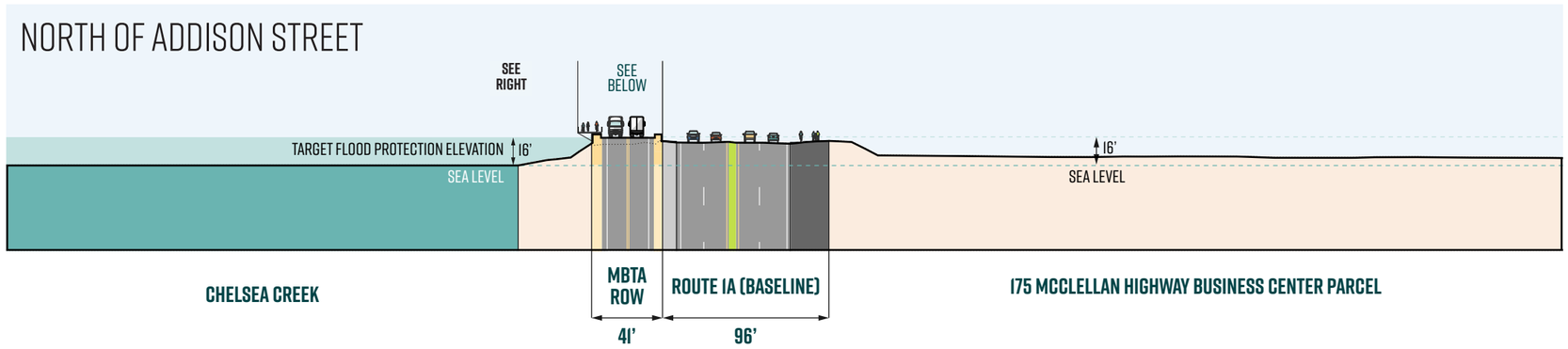
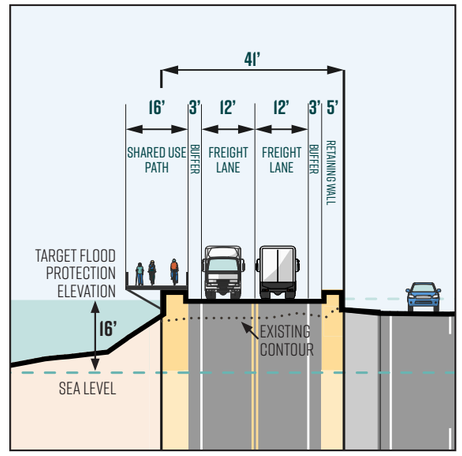


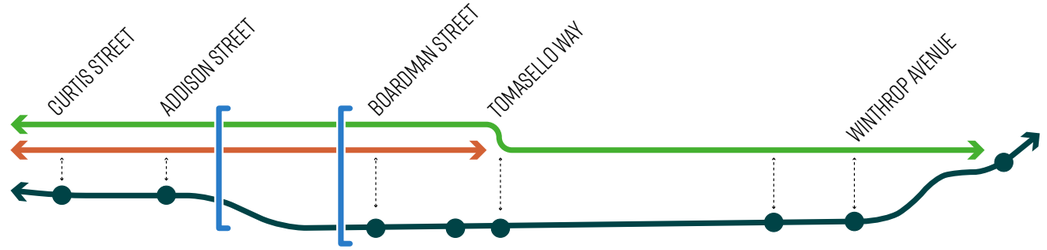
Figure 3–12.Bypass Road with Shared Use Path (SUP) – Addison Street to Boardman Street

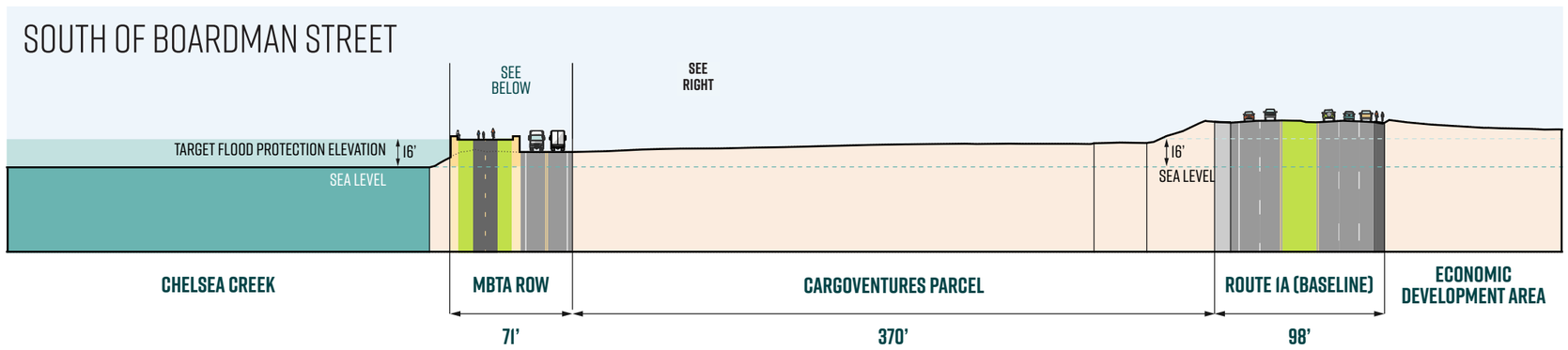




Beyond this point, and in the absence of a turn lane, additional width exists within the rail ROW to separate the Shared Use Path and seawall (Figure 3–13). As in Alternative 1, both the Shared Use Path and the Bypass Road would be brought up to grade with Boardman Street. Stop controls would be needed for both directions of the Bypass Road and both directions of Boardman Street to ensure the intersection operates safely. Users of the proposed Shared Use Path would also be able to make a connection along Boardman Street to access the Shared Use Path planned for the east side of Route 1A as part of the Suffolk Downs mitigation efforts.

LOCATION ALONG CORRIDOR





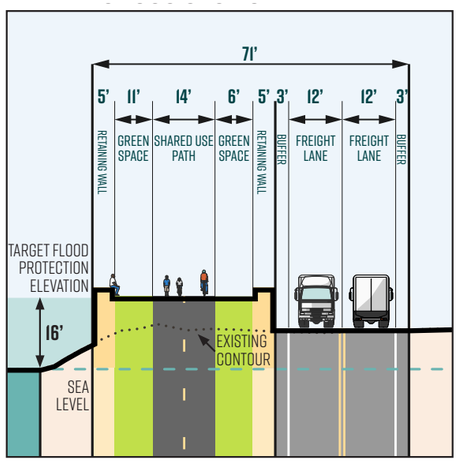
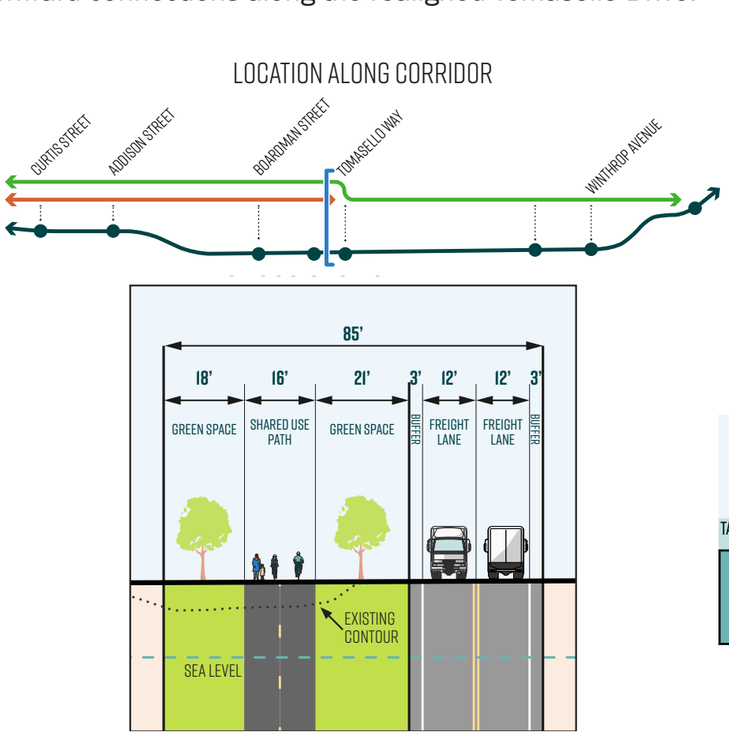


Figure 3–13. Bypass Road with Shared Use Path – North of Addison Street & South of Boardman Street

Boardman Street to the Jughandle

Between Boardman Street and the jughandle, the Shared Use Path and Bypass Road would continue to run in parallel. To accommodate traffic from the Bypass Road, the jughandle would need to be redesigned in order to preserve the ability for Route 1A southbound vehicles to turn toward the fuel tanks located on the east side while also allowing access from the Bypass Road to the fuel tanks, and to and from 480 McClellan Highway, which is proposed to be redeveloped.

The transition of the Bypass Road into the jughandle marks the end of the Bypass Road. The path would travel adjacent to the jughandle, crossing both the Bypass Road and the access to 480 McClellan Highway, so that path users could make onward connections along the realigned Tomasello Drive.



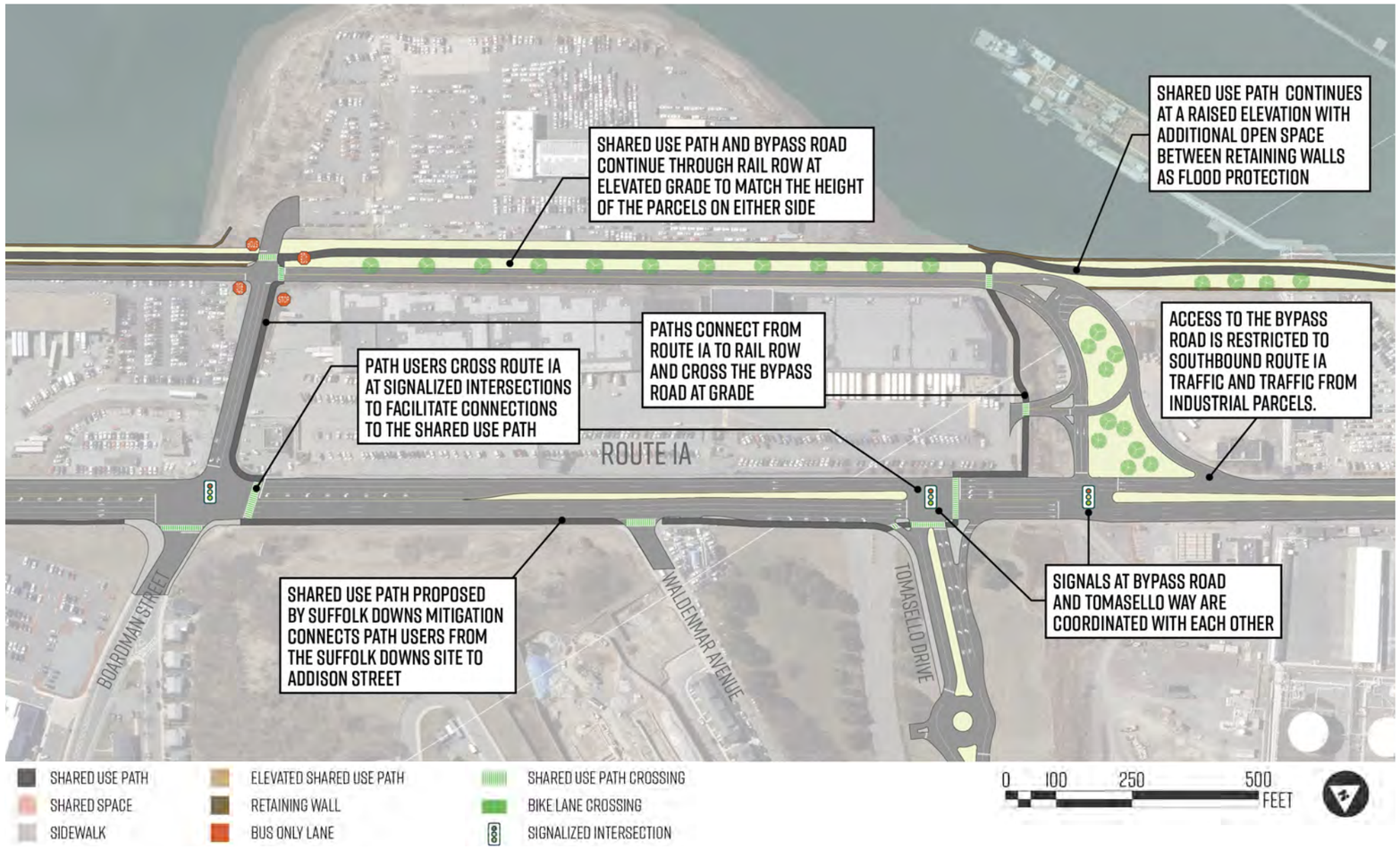


Figure 3–14. Bypass Road with Shared Use Path (SUP) – Boardman Street to Tomasello Drive

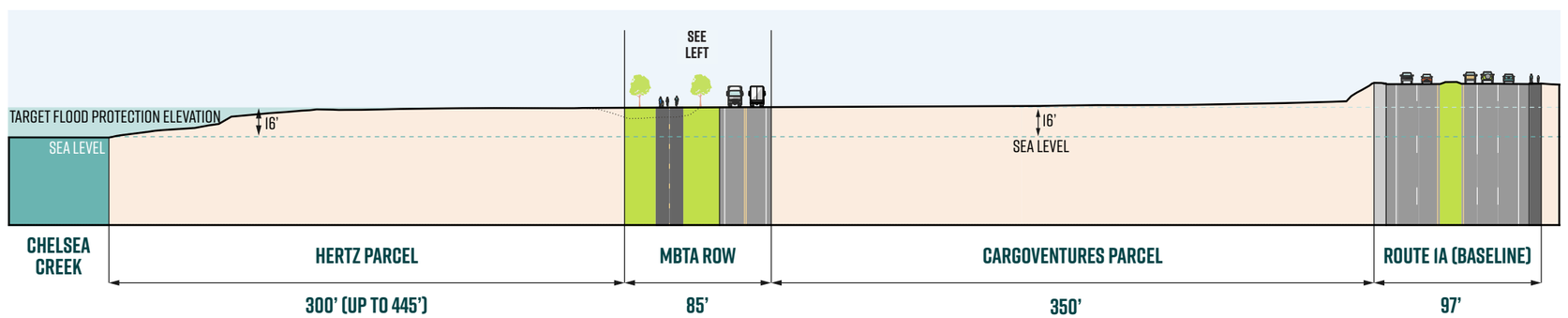


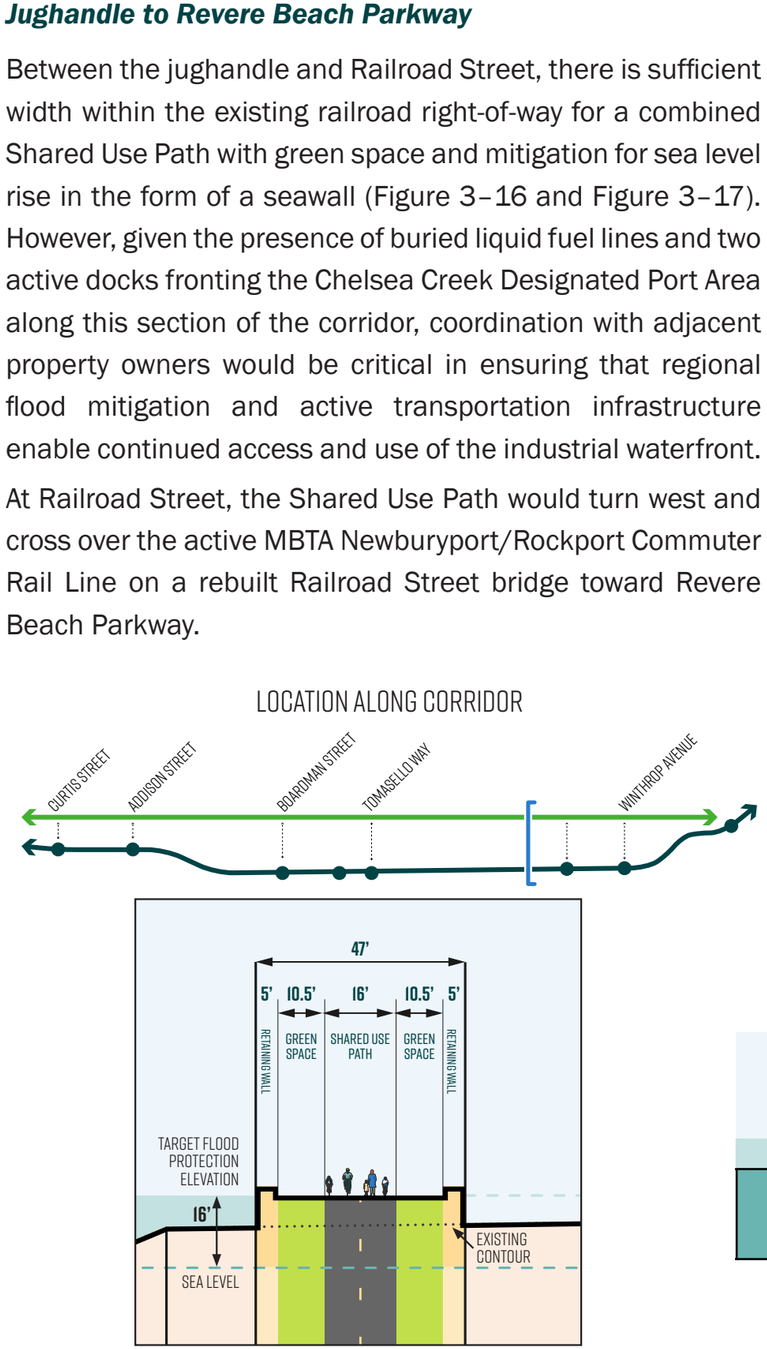
Figure 3–15. Bypass Road with Shared Use Path (SUP) – South of Tomasello Drive

3.2.3. Jughandle/Tomasello Drive – Winthrop Avenue

Jughandle to Revere Beach Parkway

Between the jughandle and Railroad Street, there is sufficient width within the existing railroad right-of-way for a combined Shared Use Path with green space and mitigation for sea level rise in the form of a seawall (Figure 3–16 and Figure 3–17). However, given the presence of buried liquid fuel lines and two active docks fronting the Chelsea Creek Designated Port Area along this section of the corridor, coordination with adjacent property owners would be critical in ensuring that regional flood mitigation and active transportation infrastructure enable continued access and use of the industrial waterfront.

At Railroad Street, the Shared Use Path would turn west and cross over the active MBTA Newburyport/Rockport Commuter Rail Line on a rebuilt Railroad Street bridge toward Revere Beach Parkway.



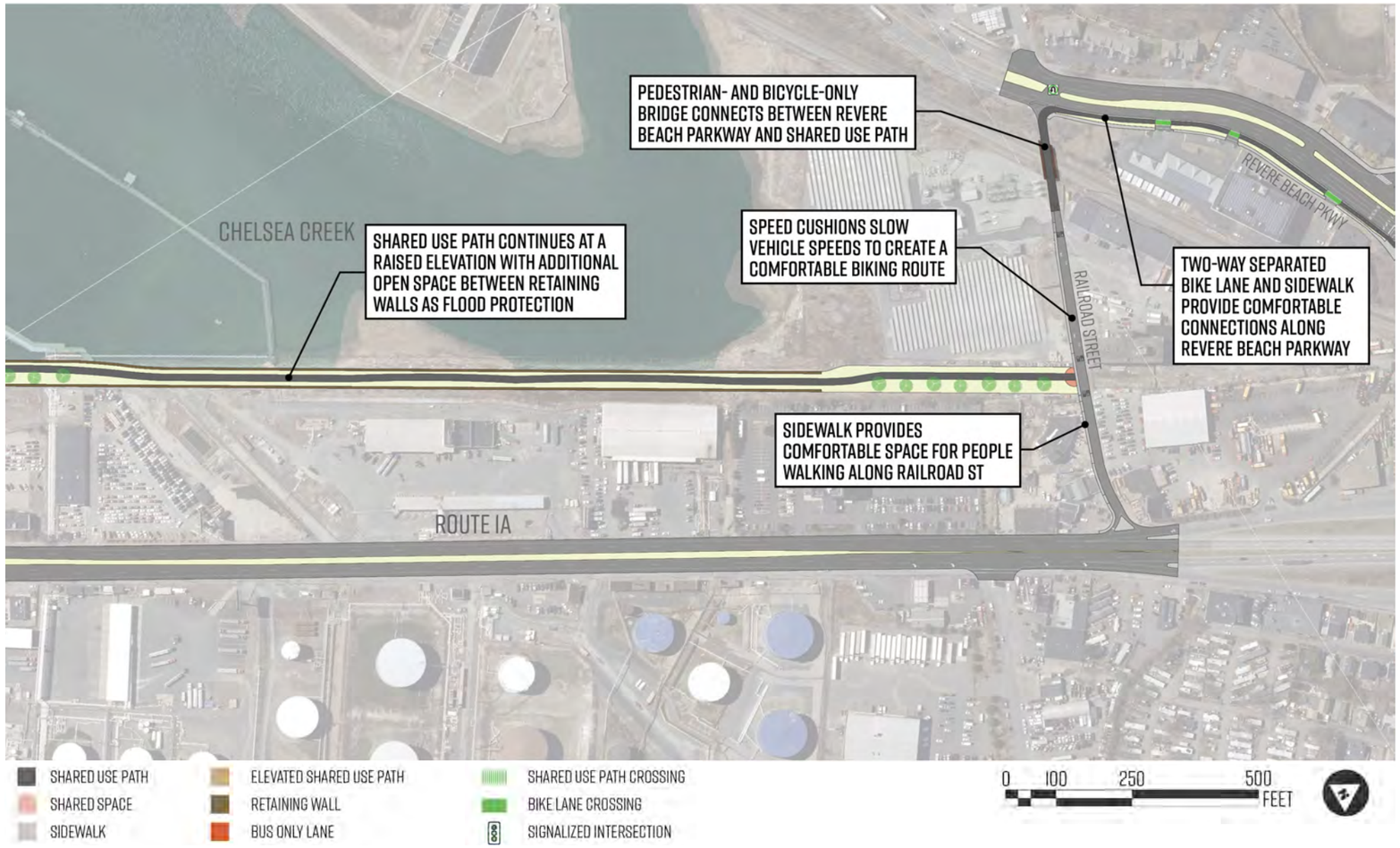


Figure 3–16. Shared Use Path (Both Alternatives) – North of Jughandle to Railroad Street

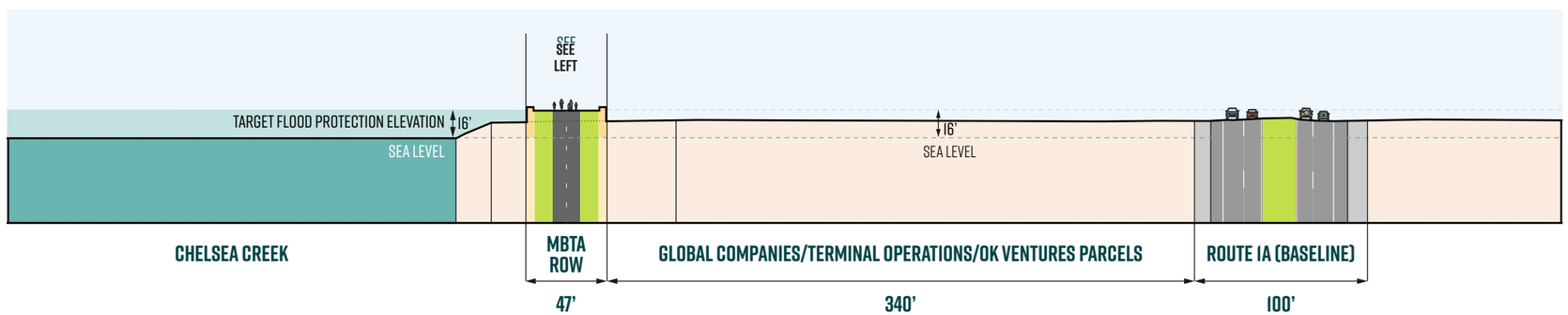


Figure 3–17. Shared Use Path (Both Alternatives) – North of Jughandle to Railroad Street

This new bridge would enable pedestrians and cyclists to safely cross the active Commuter Rail right-of-way. In replacing the bridge, additional considerations would need to be made relative to the needed vertical clearance for MBTA commuter rail trains, whether or not to retain the existing abutments and a structural assessment of those abutments, and an evaluation of the relatively steep slopes approaching the bridge for ADA compliance.

It is assumed that the Railroad Street bridge over the Commuter Rail tracks would be for Shared Use Path users only, with no motor vehicle access. Motor vehicle access would be maintained along Railroad Street east of the bridge for the adjacent parcels.

After transitioning over the active Commuter Rail line, the shared used path would intersect with Revere Beach Parkway near Vinal Street and continue to the intersection at Winthrop Avenue and Harris Street. To accommodate a two-way separated bike lane and additional buffer alongside the existing sidewalk in the northbound direction of Revere Beach Parkway, one of the three general purpose lanes would need to be eliminated beginning further south near Bay View Street. Along this southern Revere Beach Parkway segment, the proposed facility would use both vertical and horizontal separation to provide robust separation from motor vehicles. Access to adjacent parcels and parking lots would be maintained through well-defined gaps in the buffer, with high-visibility pedestrian and cyclist crossings applied at driveways.

Revere Beach Parkway/Winthrop Avenue/Harris Street

Implementing a shared use path that safely allows pedestrians and cyclists to cross the complex Revere Beach Parkway at Winthrop Avenue at Harris Street intersection and continue towards Bell Circle would require a reconfiguration. Both of the proposed routings, which are described in greater detail below, would rely on adjustments to the Suffolk Downs mitigation concept for the intersection of Revere Beach Parkway at Winthrop Avenue at Harris Street.[1]

Approaching the intersection from the south, the existing slip lane onto Winthrop Avenue eastbound (towards Suffolk Downs), which would remain under the mitigation, would be replaced by a queuing area for the proposed Shared Use Path. The new path facility would be accommodated by altering the median and shifting the Revere Beach Parkway northbound lanes to the west on both sides of the intersection.

Based on an analysis of projected traffic volumes from Suffolk Downs, the proposed northbound realignment would preserve the mitigation's four-lane northbound approach towards Bell Circle by reducing the median on the south side of the intersection.[2] However, on the north side, one of the mitigation proposal's two dedicated left-turn lanes for those headed southbound from Bell Circle towards Winthrop Avenue eastbound would need to be eliminated in order to minimize potential offset of the realigned northbound lanes while integrating the new path landing at the southeast corner.[3] The proposed three-lane southbound approach would include a dedicated left-turn lane, one through lane, and a through / right-turn lane towards Harris Street. In the opposite direction, left turns from Revere Beach Parkway northbound onto Winthrop Avenue westbound would remain prohibited.

1 The Suffolk Downs mitigation presents a four-lane northbound approach along Revere Beach Parkway (one additional lane, with two through lanes and two right-turn lanes onto Winthrop Avenue eastbound) while those headed south from Bell Circle would be able to use a four-lane approach (two additional lanes, with two dedicated left-turn lanes onto Winthrop Avenue eastbound and two through lanes). Harris Street would be limited to one-way operation in the northbound direction.

2 Suffolk Downs traffic projections assume that, in the future, more drivers would utilize the two dedicated right-turns from Revere Beach Parkway northbound towards Winthrop Avenue eastbound (towards Suffolk Downs) than would use the two dedicated left-turn lanes coming from Revere Beach Parkway southbound.

3 Instead of removing the majority of the median on the north side, as identified in the mitigation's four-lane southbound approach, the proposed three-lane southbound approach would allow for the western portion of the north side median to be preserved while still allowing for the northbound lanes to be realigned.

3.2.4. Winthrop Avenue – Bell Circle Options

North of the intersection of Revere Beach Parkway/Winthrop Avenue/Harris Street, two options are proposed to connect the Shared Use Path northward into Bell Circle. Both of these options would rely on the intersection reconfiguration described in the previous section.

The first route, Option A, would develop a traffic-calmed neighborway along Harris Street and leverage lower volume residential streets to reach the west side of Bell Circle via Beach Street (Figure 3–18). The other route, Option B, would extend the previous treatment (e.g., two-way separated bike lane, existing sidewalks) north past Winthrop Avenue and along the low-lying, higher volume northbound mainline of Revere Beach Parkway to carry users directly to the east side of Bell Circle near Veterans of Foreign Wars Parkway (Figure 3–19).

Harris Street Alignment (Option A)

To shorten crossing distances and increase comfort for those traversing this complex five-way junction on foot or bike, Option A would leverage the additional channelization identified within the mitigation while also proposing a curb extension on the northwest corner near Harris Street to complement the proposed path landing at the southeast corner (Figure 3–18). Users would cross Revere Beach Parkway via the southern leg of the intersection, then cross a shortened Winthrop Avenue via the western leg, before continuing onto a one-way northbound Harris Street (consistent with mitigation).

Along the initial block of Harris Street between Winthrop Avenue and Sewall Street, a brief segment of raised bike lane would tie-in with the proposed curb extension on the northwest corner to narrow the width of the residential street and offer separation for cyclists headed southbound against the one-way northbound flow (Figure 3–18).

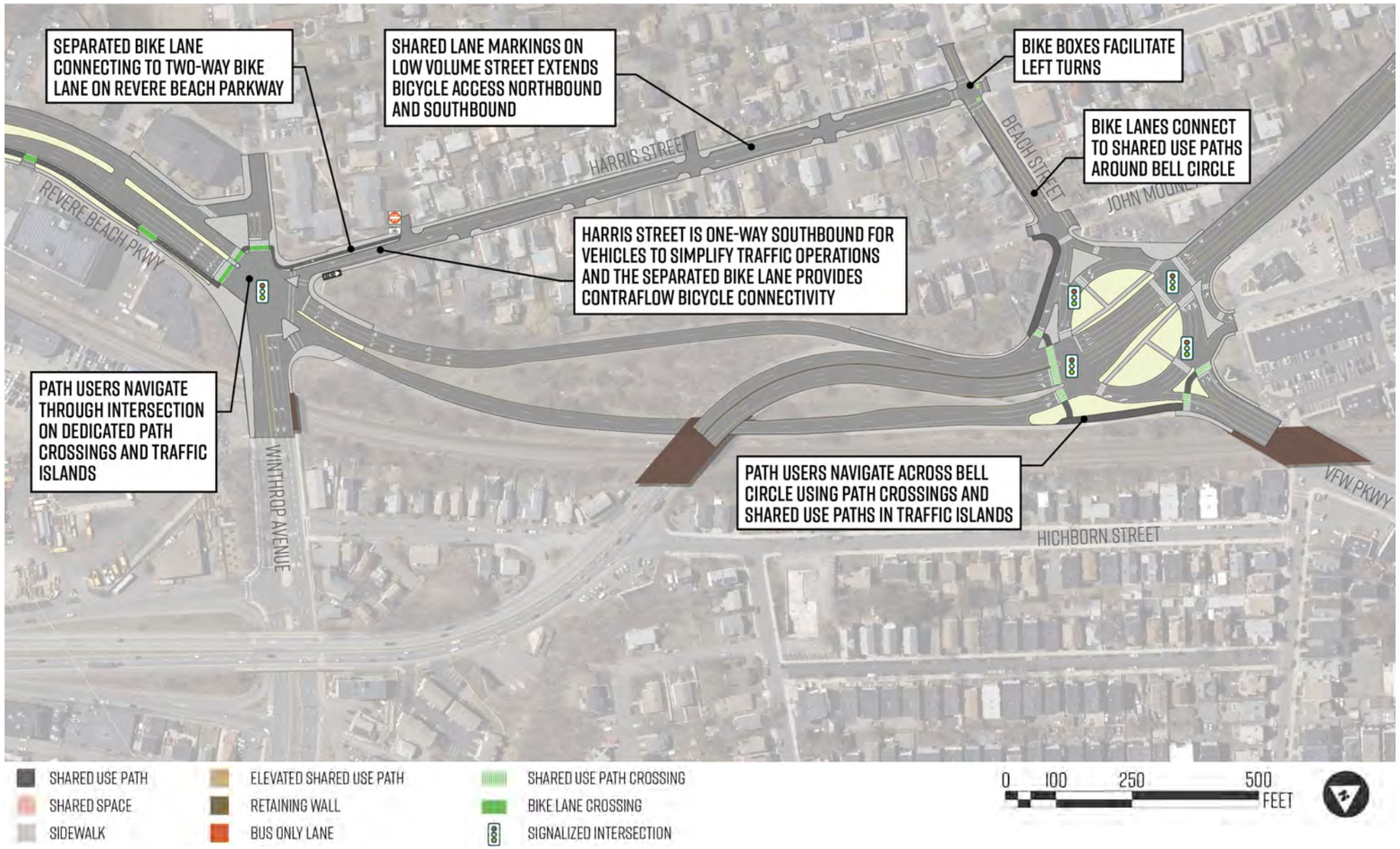


Figure 3–18. Railroad Street to Bell Circle – Option A (Harris Street) – Railroad Street to Winthrop Avenue

By removing a brief stretch of southbound vehicle flow and diverting drivers onto Sewall Street, this proposed gateway element would serve to lower motor vehicle volumes and speeds. Within this one-block segment, northbound cyclists would use a sharrow and pedestrians would use existing sidewalks. Existing ADA parking located in the southbound direction, which would be converted to a sidewalk-level protected bike lane approach to the five-way junction under Option A, could be replaced by redesignating the adjacent curb space (e.g., north of Sewall Street along Harris Street southbound, west of Harris Street along Sewall Street eastbound).

From Sewall Street to Beach Street, new neighborway treatments (i.e., curb bump-outs and sharrows) would be added in both directions to narrow the visual profile of Harris Street and supplement the existing sidewalks.

At the intersection of Harris Street and Beach Street, two-stage left-turn boxes would be added to provide a visual cue to cyclists moving between the two major intersections. Along Beach Street between Harris Street and Bell Circle, cyclists would use painted bike lanes in both directions and pedestrians would use existing sidewalks. Option A would connect to the reconfigured Bell Circle as proposed in the Suffolk Downs mitigation.

Revere Beach Parkway Alignment (Option B)

Option B would connect path users across the east side of the intersection at Winthrop Avenue with high-visibility pedestrian and bicycle crossing pavement markings to form a new eastern leg capable of accommodating a large volume of people walking and biking in both directions (Figure 3–19). The signal plan would be adjusted so as to provide separation between through-moving path users and right-turning vehicles coming to / from the east side of the intersection.[1] At the northeast corner, a proposed curb extension would create additional area for protected cycling facilities upstream while also serving to shorten crossing distances for those walking and reduce driver turning speeds.[2]

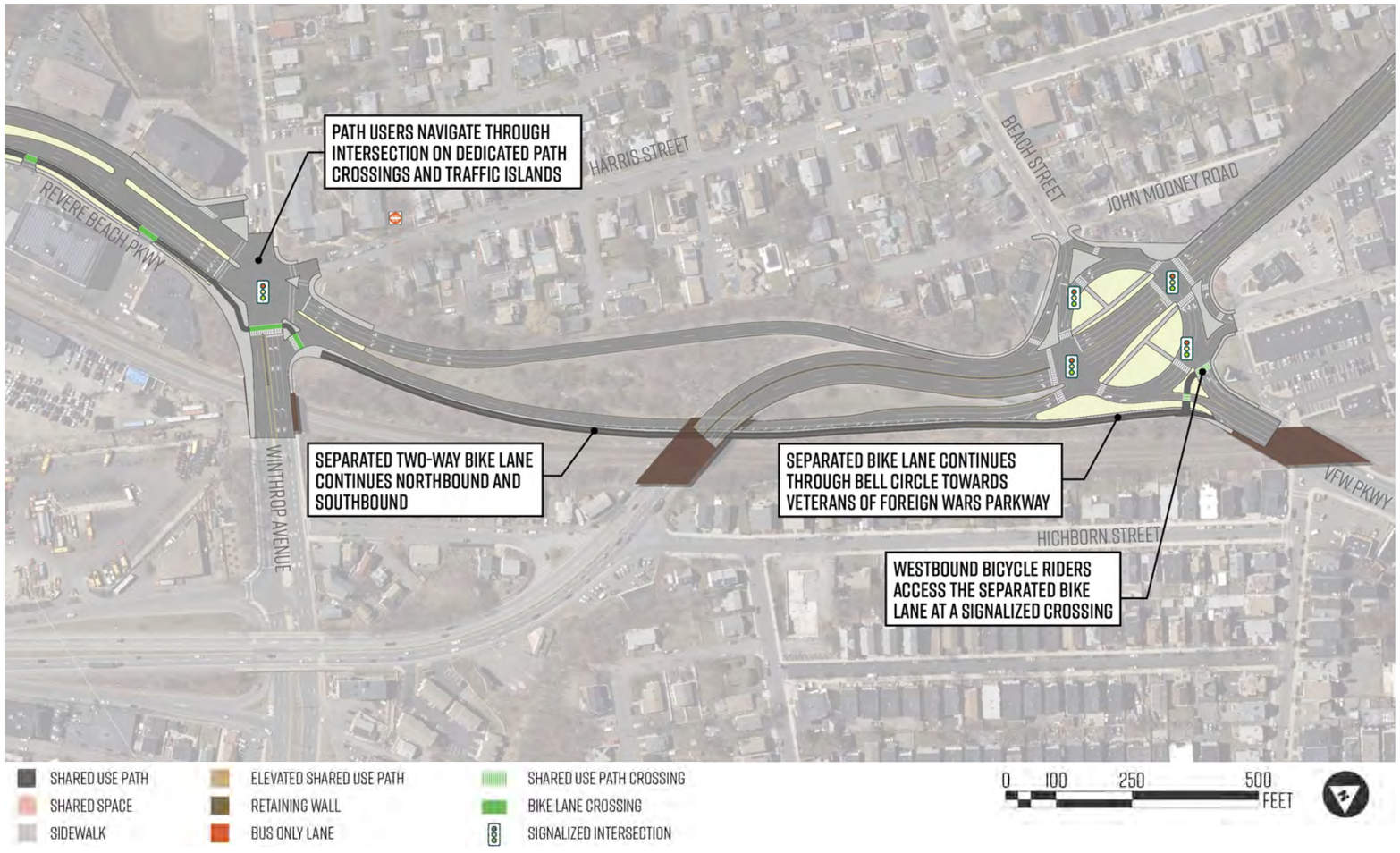


Figure 3–19. Railroad Street to Bell Circle – Option B (Revere Beach Parkway) – Railroad Street to Winthrop Avenue

From the intersection of Winthrop Avenue at Harris Street to Bell Circle, users would transition to a proposed two-way separated bike lane or existing sidewalks along Revere Beach Parkway northbound. To retain the necessary width for the new two-way bike facility while respecting the existing bridge supports, curbing, and sidewalk, Revere Beach Parkway would narrow briefly to a single lane on either side of the Route 1A overpass, before returning to two lanes just south of Bell Circle (Figure 3–19). In order to accommodate two vehicle lanes and a two-way bike facility, a portion of the mitigation's planned south side median would need to be removed. The proposed facility would connect to the reconfigured Bell Circle as proposed in the Suffolk Downs mitigation

1 Based on Suffolk Downs projected traffic volumes, the potential for multimodal conflicts would be relatively higher at the southeast corner given that the right-turn movement from Revere Beach Parkway northbound onto Winthrop Avenue eastbound would serves as the primary pathway to Suffolk Downs from areas west of Chelsea Creek.

2 This concept does not propose any adjustments to the location of the refuge island at the northeast corner of the intersection, which is planned to be relocated based on the committed mitigation.

3.3. EVALUATION CRITERIA

A set of quantifiable metrics was developed to enable the comparative evaluation of the alternatives. These evaluation criteria are based upon the project's purpose and need, study goals, and objectives of the alternatives. The following evaluation criteria capture the key benefits, costs, and impacts of the alternatives. Table 3–1 maps the study goals to different types of analyses that provide evaluation criteria.

3.3.1. Safety

A key overarching goal of the study is the improvement of safety for all corridor users, regardless of mode; a specific objective associated with this goal is the reduction of crashes in the corridor, measured by the opportunity to implement proven safety countermeasures. Each alternative is evaluated for its use of particular proposed design, signal, roadway, and intersection treatments that have been empirically shown to decrease the number of incidents. Since conflict points at intersections and along the corridor, including between the Shared Use Path and the Bypass Road, are known to indicate potential safety issues, quantifying them by alternative allows for a comparison point.

Furthermore, the reduction and minimization of conflict points at intersections and along the corridor is another enumerated study safety objective. Each alternative is measured for its ability to increase the level of comfort and reduce the level of stress for vulnerable users (here assumed to be non-motorized users), another stated study objective. This is accomplished by conducting Bicycle Level of Traffic Stress (BLTS) and Pedestrian Level of Crossing Stress (PLCS) analyses along Route 1A between Curtis Street and Bell Circle for the alternatives and comparing them.

3.3.2. Connectivity

A key connectivity-related goal is to improve freight reliability while balancing local and transportation needs. Travel times along the corridor will be calculated by mode for each alternative and compared against each other; truck volumes in each alternative will also be compared. Temporal delays at specific intersections will be calculated for each of the alternatives to measure how well or poorly they have improved traffic conditions.

Another goal of the study is to expand and enhance connectivity for users of all modes along the corridor. Using the Conveyal tool, the number of accessible employment opportunities is measured for each alternative against a baseline condition to see how implementation of Alternative 1 and Alternative 2 increase the number of jobs within reach of area residents.

The alternatives are assessed to see how many gaps in the regional bicycle and pedestrian networks they respectively eliminate; such reduction is a specific enumerated study objective. Benefits resulting from new or enhanced access to the regional shared use path network are evaluated for residents living adjacent to the study corridor based on the type of benefit that would be realized (i.e., improved access to existing or planned facilities versus entirely new connections into the regional network).

3.3.3. Environment, Sustainability and Climate Change Resilience

The goal of enhancing the resilience of the corridor and its infrastructure is measured by quantifying the area of impermeable surface along the railroad ROW in each alternative. Since impervious surfaces are known to facilitate flooding via runoff and detract from proper drainage, as well as contribute to the creation of heat islands, impermeable surface are inversely correlated to resiliency (i.e., less impermeable surface helps reduce impacts from flooding). Each alternative is evaluated for the extent to which it affords new flood protection components within key flood entry pathways, including the segments located on either side of the peninsula that spans from Boardman Street to Tomasello Way.

A desktop-level review of potential environmental impacts evaluates each alternative's potential to affect or influence noise levels along the Route 1A roadway corridor and proposed Bypass Road; impact adjacent wetland areas, Areas of Critical Environmental Concern, Massachusetts Chapter 91 tidelands; and potentially result in the release of oil and/or hazardous materials as a result of future construction activities.

In addition to the amount of new accessible greenspace created within the rail ROW, the study gauges the potential of each alternative to restore or improve access to and use of natural resources via a combination of qualitative (e.g., ease of access to the Chelsea Creek shoreline and other natural resources) and quantitative (e.g., number of new access points provided to such accessible open spaces).

3.3.4. Equity

The specific goal of reducing corridor burdens and enhancing corridor benefits on Environmental Justice communities is measured by calculating the impacts of freight traffic on noise and air quality for each alternative, with truck volumes along Route 1A and/or the proposed Bypass Road to serve as proxies for these results, as they are the primary producers of such detriment. Prior analyses (e.g., walking and biking ease of access, acreage of new green space created) are combined with demographic data for corridor communities to serve as a proxy for the extent to which project implementation would contribute to increased activity, thereby improving public health for the study area's vulnerable communities.

3.3.5. Feasibility

Projected capital and construction costs are critical metrics for evaluating the likelihood of each alternative's implementation. The alternatives are also assessed based on the anticipated permits required, and the likelihood of obtaining the permits, as well as official and formal planning processes needed prior to implementation.

Table 3–1. Goals, Types of Analysis & Evaluation Criteria

STUDY GOAL ADDRESSED	*TYPE OF ANALYSIS*	*EVALUATION CRITERIA*	*AREAS INVESTIGATED*
Safety	Crash Modification Factors	Change in Crash Predictive Metrics	1A at Curtis, Boardman, Tomasello
Safety	Pedestrian Comfort	Pedestrian Level of Crossing Stress (# of Lanes, Traffic Control, Speeds)	Intersections
Safety	Bicyclist Comfort	Length of High Comfort Bikeways (Bicyclist Level of Traffic Stress ≤2)	Throughout
Connectivity	Intersection Analysis	Synchro Delay / LOS / Queue	Boardman, Tomasello, Curtis, Frankfort
Connectivity	Truck Routing (1A / Bypass Road)	Traffic Volume Δ / Comparison	1A and Bypass traffic comparisons
Connectivity	Travel Time Savings (Auto + Freight)	Travel Time Δ / Comparison	1A / Rail ROW
Connectivity	Employment Access	Access within a 45-minute Walk/Bike + Transit (# of Jobs)	Throughout
Connectivity	Non-Motorized Access	Travel Time + Safe Crossings + Gaps	Key Chelsea, Revere, East Boston points
Connectivity	Residential Access to Regional Shared Use Path Network	Access within a ¼ Mile (# of Residents)	Throughout
Environment, Sustainability and Resilience	Flood Mitigation / Heat Island	Size of Impermeable Surface Retained	Rail ROW
Environment, Sustainability and Resilience	Flood Protection	Extent of Flood Protection Provided at Key Entry Points	Rail ROW
Environment, Sustainability and Resilience	Environmental Impact	Noise + Wetlands + Areas of Critical Environmental Concern + Tidelands + Hazardous Materials	1A and Bypass
Environment, Sustainability and Resilience	Restore or Improve Access to and Use of Natural Resources	Acres of New Greenspace + New Access Points + Ease of Access	Rail ROW
Equity	Noise & Emissions	Truck Volumes and Proximity as Proxy	1A / Rail ROW
Equity	Public Health	SUP Facility Length	Throughout
Equity	Public Health	Improved Access to Recreation and Natural Resources for Environmental Justice Communities	Throughout
Feasibility	Estimated Cost	Projected Cost	Throughout
Feasibility	Permitting / General Feasibility	Qualitative Rating	Throughout

3.4. EVALUATION OF ALTERNATIVES

3.4.1. Safety

Crash Modification Factors

To compare multimodal safety between the two alternatives, the study evaluated Crash Modification Factors (CMFs) that were proposed as part of the alternatives, and reviewed them in the context of corridor conditions, safety risks, and research on mitigating safety risks. These comparisons were performed on an intersection-by-intersection basis at the intersections with a record of high crash incidence, identified safety risks, and/or potential safety risks:

- Route 1A/ Curtis Street
- Route 1A/Addison Street
- Revere Beach Parkway/Winthrop Avenue/Harris Street intersection
- Conflict points between the proposed Bypass Road and proposed Shared Use Path

The CMFs, empirical data, and other findings are presented below by location.

Curtis Street

In Alternative 1, the Shared Use Path would be carried underneath the Curtis Street bridge to connect with Day Square via the Saratoga Street off-ramp. This alignment avoids vehicular conflicts at Curtis Street and more directly connects Shared Use Path users with Day Square. Bicycle and pedestrian connections to Chelsea Street would be aligned near the waterfront to the Chelsea Street bridge, as shown in Figure 3–4.

In Alternative 2, the Shared Use Path would connect with the Curtis Street bridge. The Shared Use Path would then have connections across the Curtis Street intersection to the Saratoga Street off-ramp towards Day Square and turn right across the Curtis Street bridge toward Chelsea Street. To maintain safety for cyclists and pedestrians, a signal to protect cyclists and pedestrians from vehicles, and in particular trucks, would be installed to supplement the Suffolk Downs mitigation concept. The proposed signal phasing would include protection for cyclists and pedestrians by separating the southbound right-turn movement onto the Curtis Street bridge from the adjacent crosswalk and bicycle crossing, which would proceed concurrently with the green signal indication for the southbound off-ramp through movement towards Day Square. Right-turn-on-red movements would be precluded during the cyclist phase through the use of static or dynamic (blank-out) signage.

Research available on the federally-funded Crash Modification Clearinghouse supports separating vehicular right-turns from cyclist through movements.[1] This guidance is also supported in the National Association of City Transportation Officials (NACTO)'s Urban Bikeway Design Guide.[2]

Addison Street

There is currently a Rectangular Rapid Flashing Beacon (RRFB) located at the Route 1A at Addison Street intersection. Due to high speeds, high volumes, upstream northbound geometry, and number of lanes, low vehicular compliance with this signal has been observed.

Both alternatives propose to upgrade the location to a High-Intensity Activated Crosswalk (HAWK) signal, which would enhance signal visibility. **Empirical research from 2018 identified that vehicle yielding compliance rates ranged from 33 to 63 percent at crossings with RRFBs while compliance was 78 to 82 percent at crossings with HAWKs.**[3] Based on the location, upstream northbound curvature, and traffic volumes, the overhead beacons and indications would also improve visibility.

As part of this upgrade, it is proposed to relocate the crosswalk to the south side of the intersection to mitigate conflicts with vehicles turning right from Addison Street.

Revere Beach Parkway / Winthrop Parkway / Harris Street

Both alternatives propose to improve bicycle connectivity and safety in this area of Revere – Chelsea – East Boston, by providing protected bike facilities along Revere Beach Parkway and then through the intersection. These improvements vary across two options, one that continues north along the Revere Beach Parkway ramp to Bell Circle, and the other that utilizes Harris Street. The proposed intersection geometry and signal phasing has been modified in the included analysis to reflect these added safety benefits.

A 2011 study included in the Crash Modification Clearinghouse indicates that **installing a cycle track 2 to 5 meters from the side of a main road with protected cyclist signal phasing –** similar to the proposed design along Revere Beach Parkway approaching Winthrop Parkway – **can reduce vehicle and bicycle crashes by 45 percent.**[4]

1 https://www.cmfclearinghouse.org/detail.cfm?facid=3257
2 https://nacto.org/publication/urban-bikeway-design-guide/bicycle-signals/bicycle-signal-heads/#:~:text=Bicycle%20Signals.,yellow%2C%20and%20green%20arrow%20displays
3 https://trid.trb.org/view/1497062
4 https://www.cmfclearinghouse.org/detail.cfm?facid=4034

Bypass Road / Shared Use Path Interfaces

In Alternative 2, the Shared Use Path would cross the Bypass Road several times – in the southern part of the corridor near Addison Street, a potential interface near Boardman Street, and at two locations near Tomasello Drive / the jughandle. These crossings represent four additional conflicts that would not take place under Alternative 1.

In Alternative 2, each of these crossings would be controlled via a well-lit, highly visible crosswalk with an overhead-mounted RRFB or HAWK signal. Empirical research shows that RRFB and HAWK treatments improve yield compliance and improve safety at pedestrian crossings. While these treatments do mitigate conflicts between Shared Use Path users and vehicles in Alternative 2, these crossings are still inherently more dangerous than the lack of potential conflicts that would be present within Alternative 1.

Pedestrian Safety and Level of Crossing Stress

While the alternatives for this project are primarily focused on the rail right-of-way, safe pedestrian access across Route 1A to the natural resource (Chelsea Creek) and recreational facility (the Shared Use Path) is a critical consideration for both alternatives. As a high-speed, high-volume road, Route 1A is currently a barrier for pedestrians, with a wide alignment, high-speed traffic, and a shortage of safe and comfortable crossings with long distances between them. Neither of the alternatives presented introduce new crossings of Route 1A itself, however design interventions including signalization would be introduced at Addison Street to address challenges at that crossing.

To help quantify the impact of changes to the pedestrian environment, a Pedestrian Level of Crossing Stress (PLCS) analysis was completed. This analysis compares crossing stress scores along the Route 1A corridor between Curtis Street and Bell Circle. The score for each intersection considers the traffic control type, the number of lanes a person walking must cross, and vehicle speeds for each crossing within an intersection, and then uses a "weakest link" method to apply intersection scores.

The total number of intersections that are comfortable for people to cross are compared to the baseline condition and across alternatives, as quantified in Table 3–2 through Table 3–4 and illustrated within Figure 3–20 through Figure 3–22. Higher scores indicate more stressful conditions.

Table 3–2. Pedestrian Level of Crossing Stress – Route 1A Intersections

PEDESTRIAN CROSSING LOCATION	ID	BASELINE	ALTERNATIVE 1 SHARED USE PATH	ALTERNATIVE 2 BYPASS ROAD & SHARED USE PATH
Curtis St at Route 1A	1	4	1 (crosses under bridge)	3
Addison St at Route 1A	2	4	2	2
Boardman St at Route 1A	3	3	3	3
Tomasello Dr at Route 1A	4	3	3	3
Percentage of Route 1A Intersections that are Low-Stress	--	**0%**	**50%**	**25%**

Table 3–3. Pedestrian Level of Crossing Stress – Route 1A Intersections

PEDESTRIAN CROSSING LOCATION	ID	BASELINE	ALTERNATIVE 1 SHARED USE PATH	ALTERNATIVE 2 BYPASS ROAD & SHARED USE PATH
Bypass Road at Addison Street	F1	--	--	2
Bypass Road at Boardman Street	F2	--	--	2
Bypass Road at Tomasello Drive	F3	--	--	2
Driveway at Tomasello Drive	F4	--	--	2
Percentage of Bypass Intersections that are Low-Stress	--	**N/A**	**N/A**	**100%**

Table 3–4. Pedestrian Level of Crossing Stress – Route 1A Intersections

PEDESTRIAN CROSSING LOCATION	ID	BASELINE	ALTERNATIVE 1A/2A HARRIS STREET	ALTERNATIVE 1A/2A REVERE BEACH PARKWAY
Revere Beach Pkwy at Winthrop Ave	5	3	3	*3*
Bell Circle	6	3	3	3
Percentage of Northern Intersections that are Low-Stress		**0%**	**0%**	**0%**

Figure 3–20. Pedestrian Level of Crossing Stress – Baseline Conditions

Figure 3–21. Pedestrian Level of Crossing Stress – Shared Use Path Only Alternative

Figure 3–22. Pedestrian Level of Crossing Stress – Bypass Road with Shared Use Path

Bicycle Safety and Level of Traffic Stress

All of the alternatives would provide new shared use path facilities that would support biking in a high-comfort, fully-separated environment. To help quantify the impact of the proposed alternatives, a Bicycle Level of Traffic Stress (BLTS) analysis was completed. This analysis compares the scores along the Route 1A corridor between Curtis Street and Bell Circle. The score considers bicycle facility type, number of travel lanes, speed limits, and on-street parking. The length of low-stress (i.e., LTS scores 1 or 2) facilities between each alternative and the baseline were compared. Connectivity to low-stress bicycle segments at either end, and along the corridor were also considered.

Baseline

The baseline condition includes a total of approximately 4,300 feet of high-comfort bikeways along Route 1A between Addison Street and Tomasello Drive, all of which is contained within a shared use path along the east side of Route 1A in the northbound direction (Figure 3–23), which is proposed as part of the Suffolk Downs mitigation package. This path provides a connection between low-stress streets in the Suffolk Downs development and Addison Street, though connections further into East Boston are limited by Saratoga Street.

Alternative 1

The Shared Use Path Only alternative would add approximately 13,600 feet of high-comfort bikeways along the study corridor, spanning between Curtis Street and the Revere Beach Parkway/Winthrop Avenue/Harris Street intersection. The bikeways include about 12,000 feet of shared use path, 1,200 feet of bike path, and 400 feet of shared on-street segments. From Curtis Street, the route connects to the south via a path to Bennington Street which would provide access to much of East Boston on separated bike lanes, including Day Square and the Mary Ellen Welch Greenway. The route also provides connections to Chelsea via a proposed path along Chelsea Street and into East Boston via connections to Addison and Boardman Streets.

Alternative 2

The Bypass Road with Shared Use Path alternative would add approximately 13,600 feet of high-comfort bikeways along Route 1A, spanning between Curtis Street and the Revere Beach Parkway at Winthrop Avenue at Harris Street intersection. The

bikeways include roughly 12,000 feet of shared use path and 400 feet of shared on-street segments. From Curtis Street, the route connects further south via a path to Bennington Street which would provide access to much of East Boston on separated bike lanes, including Day Square and the Mary Ellen Welch Greenway. The route also provides connections to Chelsea via a proposed path along Chelsea Street and into East Boston via connections to Addison and Boardman Streets.

Option A – Harris Street

The Harris Street option continues from the Revere Beach Parkway at Winthrop Avenue intersection north via approximately 2,400 feet of high-comfort bikeways on Harris and Beach Streets. Neighborway treatments on Harris Street, including curb bump-outs and vehicle access control that limits southbound through-traffic at Sewall Street, manage vehicle volumes to ensure this segment is low-stress, while generous bike lanes without curbside conflicts are included on Beach Street. This option provides more direct connections to Revere neighborhoods located on the west side of Bell Circle (Figure 3–24). However, path users would still need to complete multiple vehicular crossings to reach the more desirable, east side of Bell Circle – where retail, transit, residential and recreational uses are already present or proximate.

Option B – Revere Beach Parkway

The Revere Beach Parkway option continues from the Revere Beach Parkway at Winthrop Avenue intersection north via approximately 2,000 feet of shared use path in the northbound direction of Revere Beach Parkway leading to Bell Circle (Figure 3–25). This approach provides direct connection to the east side of Bell Circle, which allows for lower stress connections between the study corridor and notable destinations, including East Revere neighborhoods, major retail along the Veterans of Foreign Wars Parkway corridor, MBTA Blue Line at Wonderland, and America's first public beach (Revere Beach).

Figure 3–23. Bicyclist Level of Traffic Stress – Baseline Condition

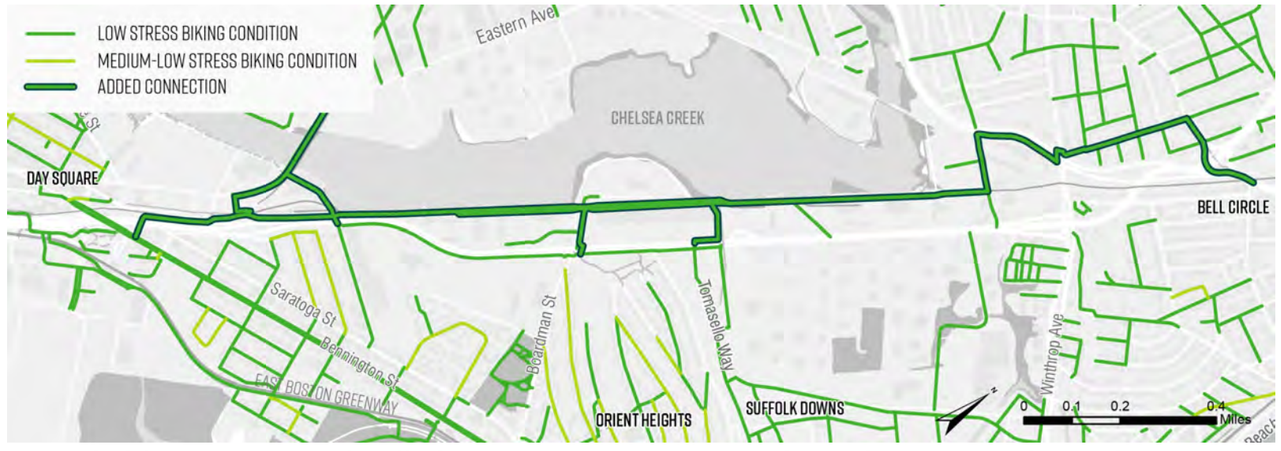


Figure 3–24. Bicyclist Level of Traffic Stress (Low and Medium-Low Stress Only) – Harris Street (Option A)

Figure 3–25. Bicyclist Level of Traffic Stress (Low and Medium-Low Stress Only) – Revere Beach Parkway (Option B)

3.4.2. Connectivity

Both Alternative 1 and 2 seek to improve connectivity for a wide range of users. Both alternatives include the Shared Use Path from Addison Street to Bell Circle, serving pedestrians, cyclists, and other non-motorized users, while Alternative 2 also includes the proposed Bypass Road, which would run from the existing Martin A. Coughlin Bypass Road north to the proposed Route 1A at Jughandle / Tomasello Drive intersection (modified through Suffolk Downs mitigation).

The Shared Use Path and the Bypass Road offer the potential to connectivity for a variety of modes, reduce travel delays and travel times, improve employment access, and lower stress for non-motorized users.

Truck Use of the Bypass Road

The following are key considerations in evaluating the performance of Alternative 2 and its proposed Bypass Road:

- What are the travel time and reliability benefits of using the Bypass Road?
- How many trucks would likely use the facility?
- How would trucks using the rail ROW affect traffic operations along Route 1A?
- How would a shift in truck volumes from Route 1A to Alternative 2's Bypass Road affect different user groups (i.e., corridor residents and path users) in terms of potential noise and air quality impacts?

Vehicle Travel Time Analysis – Bypass Road vs. Route 1A

To help understand the utility of the proposed Bypass Road (Alternative 2), travel times to and from Route 1A to the Logan Airport South Cargo area with and without the Bypass Road were compared. This route was used for comparison because it is one of the most likely destinations / origins for trucks traveling along the Bypass Road to the Martin A. Coughlin Bypass Road.

Travel times were estimated using Google Maps, which provides ranges of travel times at different times of day and different days of the week, in the existing conditions. Travel times were estimated on a typical Tuesday during typical AM peak hour, midday peak hour, and PM peak hours traveling both to and from the Logan Airport South cargo area to / from Route 1A. Existing conditions were used to analyze travel for the following reasons:

- The proposed Bypass Road is likely to be most beneficial for vehicles traveling to / from the South Cargo area; however, as this facility had yet to be proposed when the Suffolk Downs redevelopment filings were submitted, the proposed Bypass Road was not included in the 2040 Suffolk Downs model
- The range of travel times provided by Google Maps is helpful to understand travel time variability, including not only the minimum travel time but also the average and potential maximum typical travel times as well

For southbound vehicles in particular, it was determined that drivers have a few options when traveling to the South Cargo area: they can either remain on Route 1A and exit at Transportation Way and then proceed on surface streets to the cargo facilities ("Existing Highway"), or they can route to the Coughlin Bypass Road and then use exclusively surface streets to access the cargo facilities ("Existing Coughlin + Surface Street"). Detailed data and routing for each travel time is included in the Appendix.

Figure 3–28 and Figure 3–29 display comparisons of estimated southbound and northbound travel times via the Existing Highway network, the Coughlin + Surface Street route, and the proposed Bypass Road included within Alternative 2 ("Proposed Alt. 2 Bypass" route).

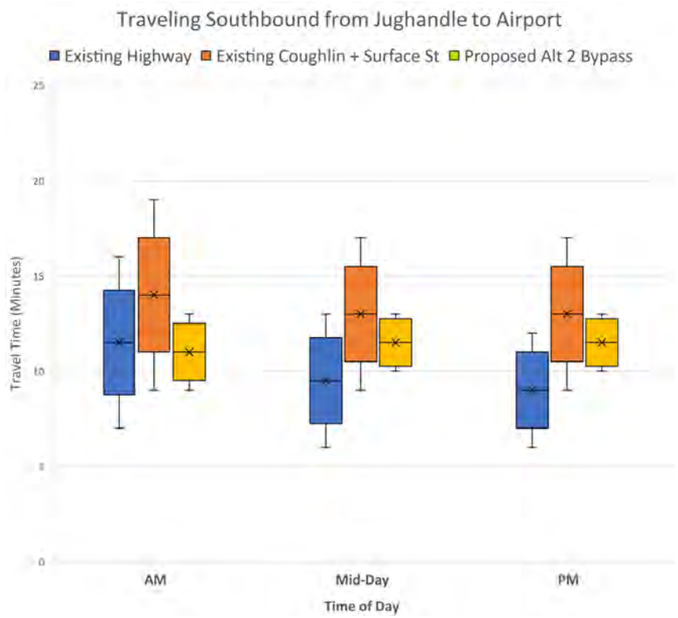


Figure 3–26. Travel Times by Time of Day – Southbound Direction

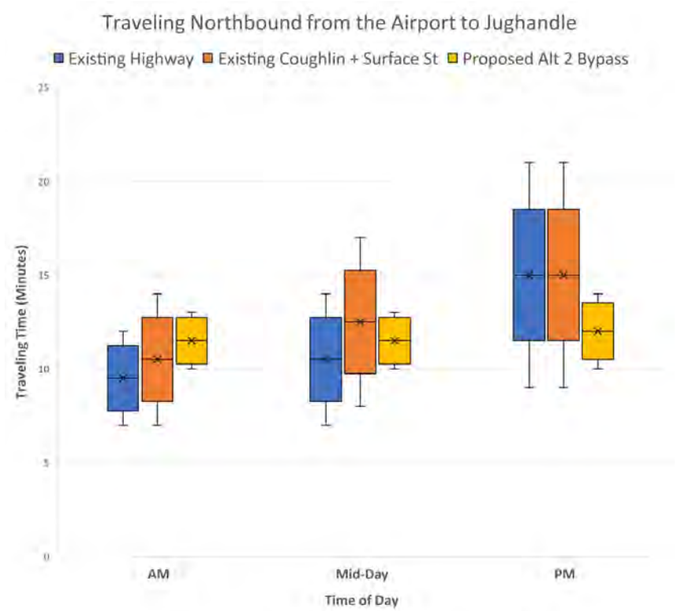


Figure 3–27. Travel Times by Time of Day – Northbound Direction

The proposed condition travel time was estimated by dividing the length of the proposed Bypass Road by an average speed of 15 miles per hour and adding this time to the Google Maps estimates from the Coughlin Bypass Road to the South Cargo area. The box-and-whisker plots seen in Figure 3–26 and Figure 3–27 illustrate the range of travel times (including average travel time and range of likely travel time) provided by Google Maps.

The following key takeaways can be gleaned from the figures:

Southbound

- In each of the peak periods analyzed, the Existing Highway network has a lower average and minimum travel time than the Existing Coughlin + Surface Street route
- The Existing Highway network has a lower average travel time than the Proposed Alt. 2 Bypass route in the midday and PM peak hour conditions and a low minimum travel time in each of the conditions
- The southbound connection for the proposed Alt. 2 Bypass Road is projected to perform best relative to the Existing Highway network and Existing Coughlin + Surface Street route options during the AM peak period, which corresponds with the peak direction orientation (i.e., heavier inbound flows towards downtown during the morning commute)

Northbound

- Each of the three options has similar estimated travel times in the AM and midday peak hours, although the Existing Highway network performs slightly better

The northbound connection for the Proposed Alt. 2 Bypass route is projected to perform best relative to the Existing Highway network and Existing Coughlin + Surface Street route options during the PM peak hour, which corresponds with the peak direction orientation (i.e., heavier outbound flows away from downtown during the evening).

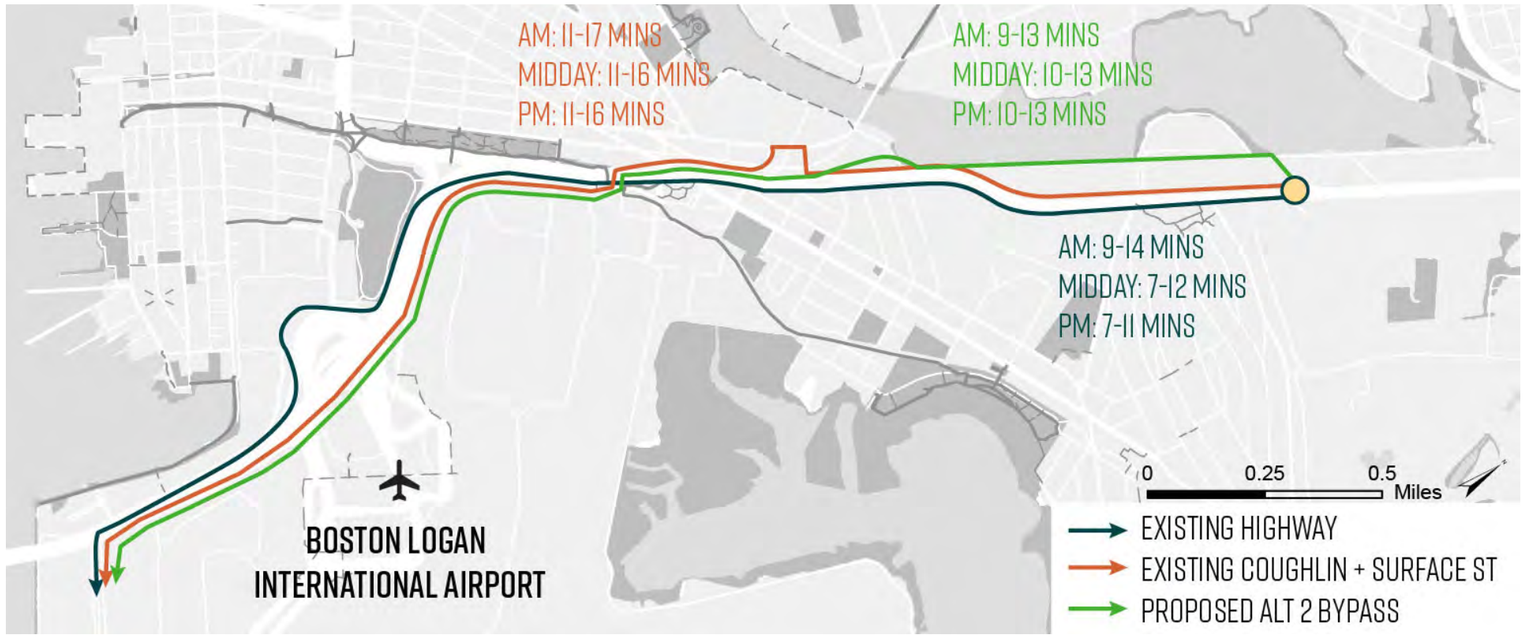


Figure 3–28. Travel Times by Route by Time of Day – Southbound Direction

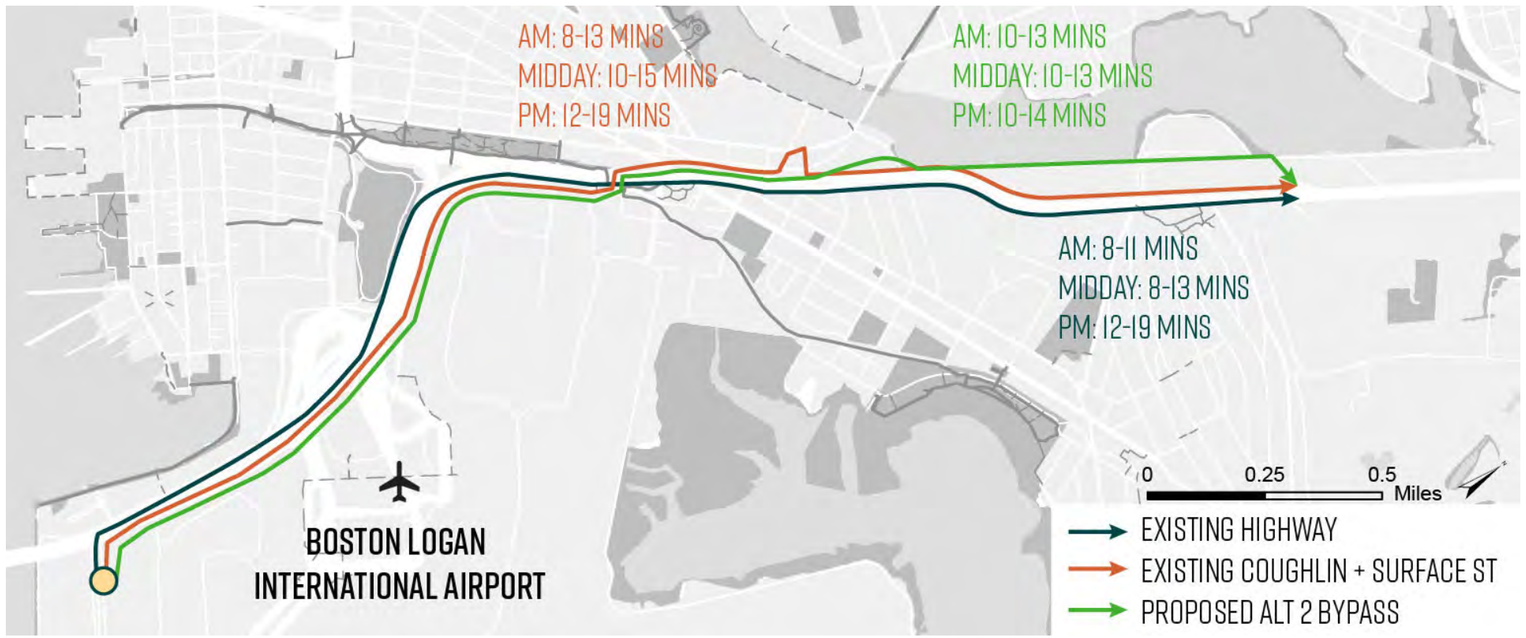


Figure 3–29. Travel Times by Route by Time of Day – Northbound Direction

Truck Volumes on the Bypass Road

To estimate future truck volumes, the following data sources were used:

- 2017 Suffolk Downs count data, which include truck volumes and percentages
- 2022 count data from a proposed development along Route 1A within the study area
- 2019 count data along the Martin Coughlin Bypass Road
- Preliminary trip generation data from developments along Route 1A, including at the Global Oil site and Cargo Ventures
- Streetlight Data, a "Big Data for Mobility" platform that allows users to understand a variety of travel behavior and origin-destination metrics and trends along roadways or within zones or areas. Specifically, data from Streetlight was used to understand where trucks traveling along Route 1A are currently travel to or arriving from as well as the routes that trucks take between Route 1A and Logan Airport, the location that would most benefit from the proposed Bypass Road.
- Travel time comparisons using existing Google Maps travel times at various times of day as well as estimated travel speeds along the proposed Bypass Road

Together, these data sources were used to evaluate the following key issues:

- How many trucks projected to be traveling along Route 1A in 2040 would divert to the proposed Bypass Road included in Alternative 2 during the course of the day and peak hour (assumes the completion of the Suffolk Downs development)?
- How many trucks arriving and departing from the proposed development would potentially use the Bypass Road during different times of day

A thorough description of the methodology used to develop the estimated future truck volumes, as well as figures that illustrate the proposed vehicle volumes in each of the conditions and peak hours analyzed, is included in the Appendix.

With a future 2040 baseline estimated at approximately 5,000 daily trucks

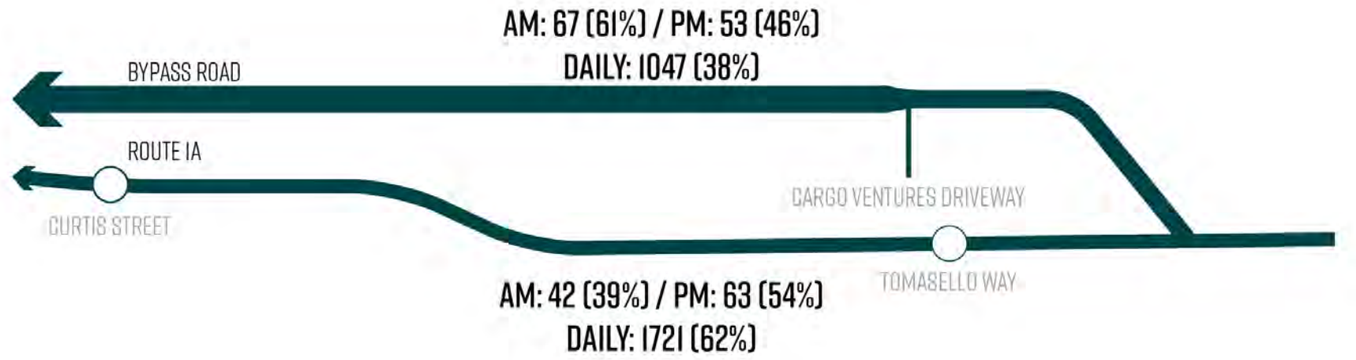


Figure 3–30. Southbound Truck Volume Projection

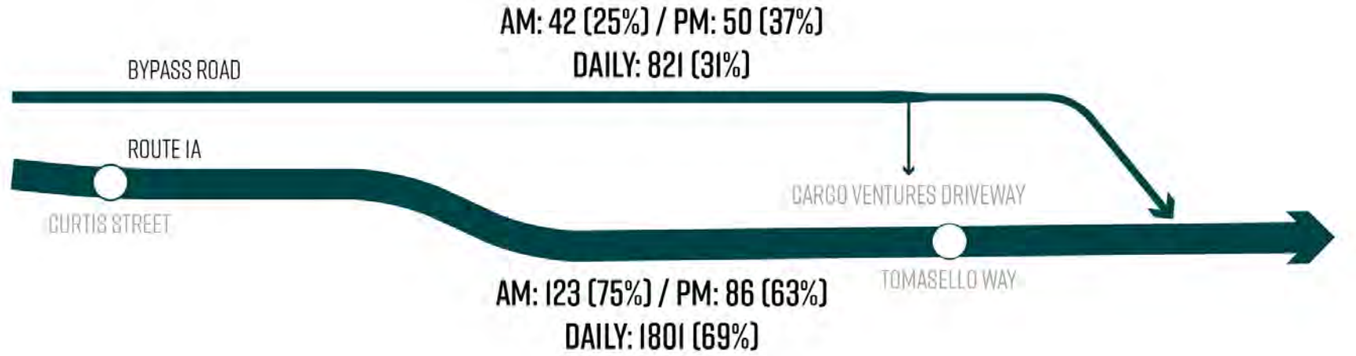


Figure 3–31. Northbound Truck Volume Projection

along Route 1A, anticipated developments related to Cargo Ventures and Global Oil, which were not modeled within the Suffolk Downs traffic analysis, would be expected to generate an additional 400 daily truck trips along Route 1A. Taking these two potential land use changes into account, this study's truck volume analysis resulted in the following estimates of truck diversions from Route 1A and onto Alternative 2's Bypass Road:

- Approximately 35 percent of daily trucks are expected to divert from Route 1A onto Alternative 2's Bypass Road
- 1,868 daily truck trips (821 NB, 1,047 SB)
- 109 AM peak hour trucks (42 NB, 67 SB)
- 103 PM peak hour trucks (50 NB, 53 SB)

These results are summarized in Figure 3–30 (southbound) and Figure 3–31 (northbound).

Intersection Congestion

The effects of these changes on traffic operations were analyzed by modifying the "2040 with Mitigation" Synchro model developed for the Suffolk Downs redevelopment traffic analysis. These analyses assume the 2040 Suffolk Downs with Mitigation scenario in a No-Build baseline condition and then include the following adjustments:

- The Coughlin Bypass Road at Frankfort Street intersection assumes the addition of the transitway proposed as part of PLAN: East Boston that would connect to the Wood Island MBTA Station and enhance East Boston – Chelsea rapid transit connectivity.
- The Route 1A at Curtis Street intersection includes signalization to improve cyclist and pedestrian safety (Alternative 2)
- The Route 1A at Addison Street intersection assumes the existing RRFB has been upgraded to a PHB / HAWK
- The Route 1A at Tomasello Drive / Jughandle intersection assumes that both intersections are operating on a single controller and that the signal equipment and infrastructure provide for safe pedestrian crossings.
- The Revere Beach Parkway at Winthrop Parkway / Harris Street intersection assumes lane configuration and signal phasing changes to accommodate the proposed bicycle and pedestrian improvements.
- The Bell Circle intersection includes lane configuration changes to accommodate proposed bicycle and pedestrian improvements in the Revere Beach Parkway sub alternatives.

The operations analysis results for the Route 1A and Coughlin Bypass Road intersections impacted by the changes in truck volumes are detailed and discussed in the paragraphs below.

The analyses were performed using Synchro 11 at the following intersections:

- Route 1A at the Jughandle turnaround
- Route 1A at Tomasello Drive
  - These two intersections were modeled on the same intersection controller in the build conditions
- Route 1A at Boardman Street
- Route 1A at Curtis Street
- Revere Beach Parkway at Winthrop Avenue / Harris Street
- Coughlin Bypass Road at Frankfort Street / Lovell Street
- Bell Circle at Revere Beach Parkway / Route 1A

The results of the following conditions were reported:

- Existing Conditions
- 2040 Suffolk Downs with Mitigation, which is equivalent to this project's No Build Conditions, as this project assumes that the Suffolk Downs mitigation projects will be implemented
- 2040 Build Conditions: Assumes Cargo Ventures and Global Oil Developments with Alternative 1 implemented
  - The Revere Beach Parkway / Winthrop Avenue and Bell Circle intersections include sub-alternatives 1A and 1B corresponding to the Harris Street and Revere Beach Parkway alignments, respectively
- 2040 Build Conditions: Assumes Cargo Ventures and Global Oil Developments with Alternative 2 implemented
  - The Revere Beach Parkway / Winthrop Avenue and Bell Circle intersections includes sub-alternatives 2A and 2B corresponding to the Harris Street and Revere Beach Parkway alignments, respectively

A summary of the intersection analyses by intersection are included in the tables below. The metrics analyzed include volume to capacity (v/c) ratio, vehicular delay (seconds per vehicle), and level of service (LOS). More detailed analysis metrics are included in Appendix TRAFFIC.

Route 1A at Jughandle

Table 3–5. Route 1A at Jughandle Intersection Analysis AM (PM)

CONDITION	V/C RATIO	DELAY (SEC/VEH)	LOS
Existing Conditions	0.89 (0.81)	16 (12)	B (B)
2040 No Build / SD Mitigation	0.93 (0.95)	38 (36)	D (D)
2040 Alt 1 – No Bypass Road	1.08 (1.05)	49 (42)	D (D)
2040 Alt 2 – With Bypass Road	1.05 (1.03)	44 (38)	D (D)

Table 3–5 indicates that the 2040 No Build and Build conditions are proposed to have relatively similar traffic operations, and that Alternative 1 and Alternative 2 are projected to operate with similar delays. The two 2040 Build Conditions scenarios are projected to operate with slightly higher delays than the 2040 No Build scenario due to the additional volumes generated by the Cargo Ventures and Global Oil developments.

Route 1A at Tomasello Drive

Table 3–6. Route 1A at Tomasello Drive Intersection Analysis AM (PM)

CONDITION	V/C RATIO	DELAY (SEC/VEH)	LOS
Existing Conditions	3.12 (0.86)	826 (53)	F (A)
2040 No Build / SD Mitigation	1.07 (0.96)	53 (49)	D (D)
2040 Alt 1 – No Bypass Road	1.08 (1.05)	35 (35)	C (C)
2040 Alt 2 - With Bypass Road	1.05 (1.03)	31 (32)	C (C)

Table 3–6 reveals that the 2040 No Build and Build conditions are proposed to have relatively similar traffic operations, and that Alternative 1 and Alternative 2 are projected to operate with similar delays. The differences between the 2040 Build Conditions scenarios and the 2040 No Build scenario are due to both the additional volumes generated by the proposed Cargo Ventures and Global Oil developments, along with slight signal modifications to the Route 1A and Tomasello Drive intersections, which propose to operate both intersections on the same signal controller, due to their close spacing.

Route 1A at Boardman Street

Table 3–7. Route 1A at Boardman St Intersection Analysis AM (PM)

CONDITION	V/C RATIO	DELAY (SEC/VEH)	LOS
Existing Conditions	2.91 (5.5)	185 (150)	F (F)
2040 No Build / SD Mitigation	8.15 (4.26)	517 (275)	F (F)
2040 Alt 1 - No Bypass Road	8.15 (4.26)	588 (311)	F (F)
2040 Alt 2 – With Bypass Road	8.15 (4.26)	586 (295)	F (F)

Table 3–7 shows that the Boardman Street intersection is projected to operate with very high delays in each of the conditions analyzed. The results align with the Synchro outputs included in Appendix B of the Suffolk Downs Final Environmental Impact Report (FEIR).

While the table indicates that the analysis projects poor operations in each of the conditions, the 2040 Build Conditions delays are slightly higher than the 2040 No Build Conditions delays, due to the added volumes from the proposed Cargo Ventures and Global Oil developments. In addition, Alternative 2 is proposed to operate slightly better than Alternative 1, due to the 1A and Cargo Ventures development truck trips that would be diverted to the Bypass Road instead of Route 1A.

Route 1A at Curtis Street

Table 3–8. Route 1A at Curtis St Intersection Analysis AM (PM)

CONDITION	V/C RATIO	DELAY (SEC/VEH)	LOS
Existing Conditions	5.68 (1.63)	1,456 (70)	F (F)
2040 No Build / SD Mitigation	1.25 (0.9)	73 (23)	F (C)
2040 Alt 1 – No Bypass Road (All-Way Stop Control)	0.93 (0.65)	35 (16)	D (C)
2040 Alt 2 – With Bypass Road (Signalized)	0.80 (0.71)	29 (20)	C (C)

Table 3–8 suggests that the proposed Suffolk Downs mitigation improvements would significantly improve operations (and safety) at the Route 1A at Curtis Street intersection, an area which has seen several fatalities in recent years. Because Alternative 2 proposes to signalize the off-ramp, the analysis projects intersection operations to further improve under this condition, as the signal provides protected crossing for Curtis Street vehicles and also protects cyclists.

Coughlin Bypass Road / Lovell Street at Service Road / Frankfort Street

Table 3–9. Service Road at Coughlin Bypass / Lovell St Intersection Analysis AM (PM)

CONDITION	V/C RATIO	DELAY (SEC/VEH)	LOS
Existing Conditions	0.43 (0.83)	13 (33)	B (D)
2040 No Build / SD Mitigation	0.76 (0.80)	23 (27)	C (C)
2040 Alt 1 – No Bypass Road	0.55 (0.75)	22 (25)	C (C)
2040 Alt 2 – With Bypass Road	0.55 (0.78)	24 (32)	C (C)

Table 3–9 indicates that the proposed traffic volume increases to 2040 and the proposed alternatives, including the Bypass Road proposed in Alternative 2, would have minimal traffic operations impact on the Martin A Coughlin Bypass Road at Frankfort Street intersection. This limited impact is due in large part to the relatively low number of peak hour trucks the proposed Bypass Road is projected to receive from Route 1A.

Winthrop Avenue (Route 145) at Revere Beach Parkway

Table 3–10. Winthrop Avenue at Revere Beach Parkway Intersection Analysis AM (PM)

CONDITION	V/C RATIO	DELAY (SEC/VEH)	LOS
Existing Conditions	1.21 (1.47)	88 (93)	F (F)
2040 No Build / SD Mitigation	2.52 (1.93)	160 (92)	F (F)
2040 Alt 1A/2A – Harris St Alignment	1.60 (1.40)	162 (106)	F (F)
2040 Alt 1B/2B – Revere Beach Parkway Alignment	1.56 (1.76)	172 (196)	F (F)

Table 3–10 shows that the Winthrop Avenue at Revere Beach Parkway Intersection is projected to operate with similar delays throughout through each of the 2040 conditions, despite the proposed changes to the intersection in terms of signal phasing and southbound lanes. The proposed changes include reducing the number of southbound lanes from two to one (as compared to Suffolk Downs Mitigation Conditions) and changing phasing overlaps to better accommodate and protect cyclists and pedestrians.

Bell Circle at Revere Beach Parkway / Route 1A

Table 3–11. Bell Circle at Revere Beach Parkway / Route 1A

CONDITION	V/C RATIO	DELAY (SEC/VEH)	LOS
Existing Conditions	1.10 (1.41)	30 (58)	C (E)
2040 No Build / SD Mitigation	2.73 (2.83)	257 (262)	F (F)
2040 Alt 1A/2A – Harris St Alignment	2.73 (2.83)	257 (262)	F (F)
2040 Alt 1B/2B – Revere Beach Parkway Alignment	2.73 (2.83)	284 (346)	F (F)

Table 3–11 suggests the Bell Circle at Revere Beach Parkway / Route 1A intersection is expected to operate with high delays through each of the 2040 conditions. This is a marginal increase in delay in sub-alternatives 1B and 2B (Revere Beach Parkway Alignment) due to proposed lane configuration changes on the Revere Beach Parkway approach to accommodate the Shared Use Path.

Employment Access

With or without the Bypass Road, the proposed Shared Use Path would significantly expand access to opportunities located north of the corridor (where transit service is limited) and, depending on the point of origin, along the northern half of the corridor itself.

This analysis discusses the extent to which the alternatives would result in expanded access to existing job opportunities within a 45-minute travel time threshold using a combination of biking, public transportation, and walking.[1] Taking the intersection of Route 1A and Curtis Street as the starting point for a potential commute journey, results from the Conveyal accessibility tool are shown in Table 3–12 based on 2018 work locations.

Table 3–12. Number of Jobs Accessible within 45 Minutes (Source: Conveyal, US Census Bureau's 2018 Longitudinal-Employer Household Dynamics (LEHD) Dataset, OpenStreetMap, MBTA)

INDUSTRY CATEGORY	BASELINE	ALTERNATIVE 1 OR 2	INCREASE IN EMPLOYMENT ACCESS
Retail Trade	17,175	18,087	5%
Light or Heavy Industry	25,473	29,847	17%
Professional or Managerial Services	176,373	178,348	1%
Government or Institutional	143,831	146,616	2%
Other Industries	11,958	12,318	3%
Total Jobs	**374,810**	**385,216**	**3%**

For those beginning from Curtis Street, development of the proposed Shared Use Path along the rail right-of-way between Day Square and Bell Circle would boost multimodal employment access by an average of three percent overall, with marked increases of 17 percent and five percent within the Light or Heavy Industry and Retail Trade categories. Within the Light or Heavy Industry category, Manufacturing has the highest increase of 79 percent.

For residents, such expansions of job access would cluster primarily within the neighboring areas of Revere and Chelsea, but also touch portions of Everett (Figure 3–32). The incremental job connectivity benefits offered by the combination of the Shared Use Path and the MBTA's Newburyport / Rockport Commuter Rail Line service can be seen in the red area stretching northward up the Salem Turnpike towards Lynn.

1 Specifically, this analysis assumes a 45-minute travel time threshold, with cycling as ingress mode and walking as egress mode. The maximum time for both walking and biking was 10 minutes, with the maximum bicyclist Level of Traffic Stress limited to Level 2. This analysis was run for a typical Thursday morning, with a departure time between 7:00 AM to 9:00 AM using a validated MBTA GTFS feed from November 2021.

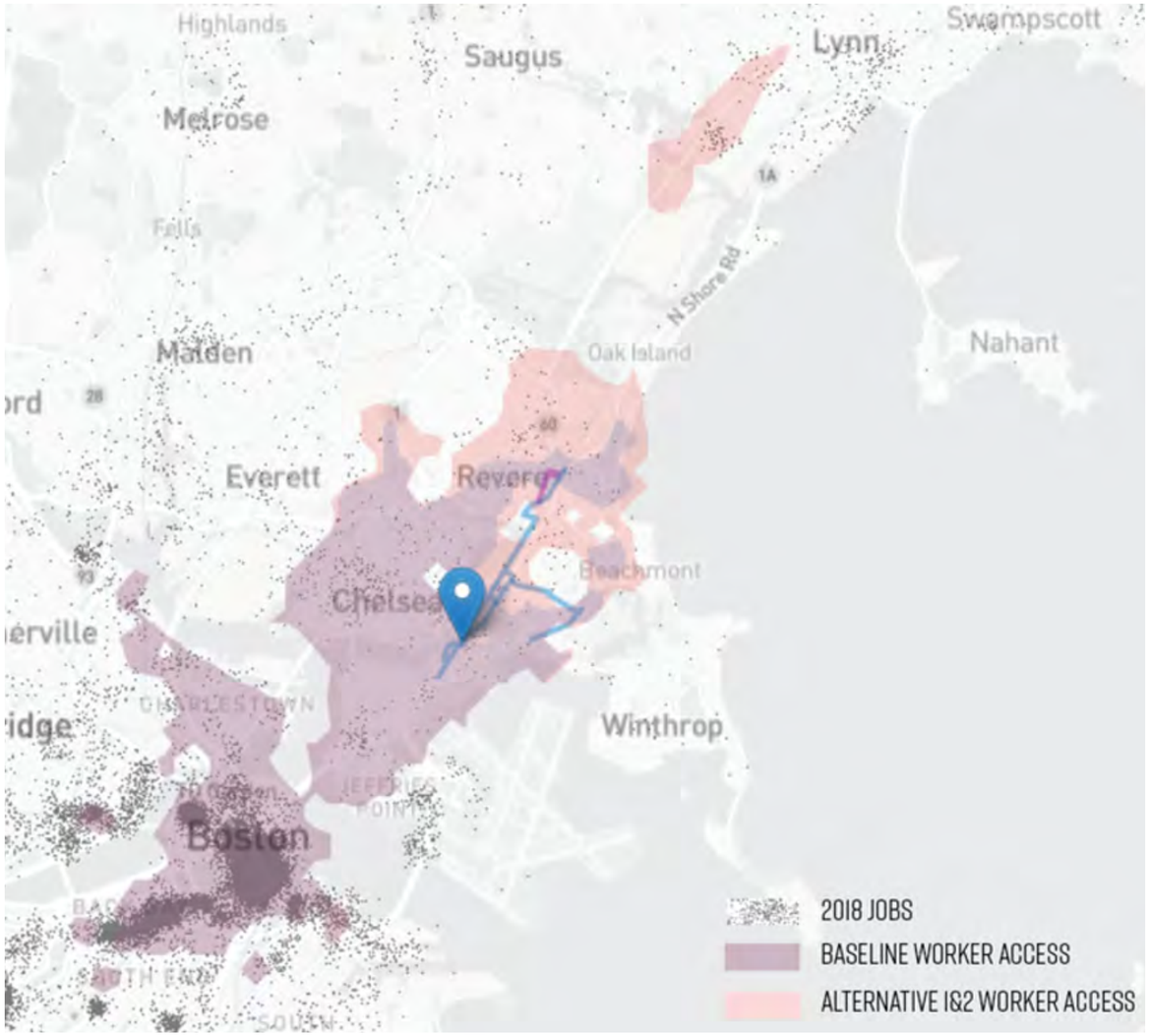


Figure 3–32. Change in Access to Job Locations for Morning Workers Commuting from Curtis Street at Route 1A (Source: Conveyal, US Census 2018 LEHD Dataset, OpenStreetMap, MBTA)

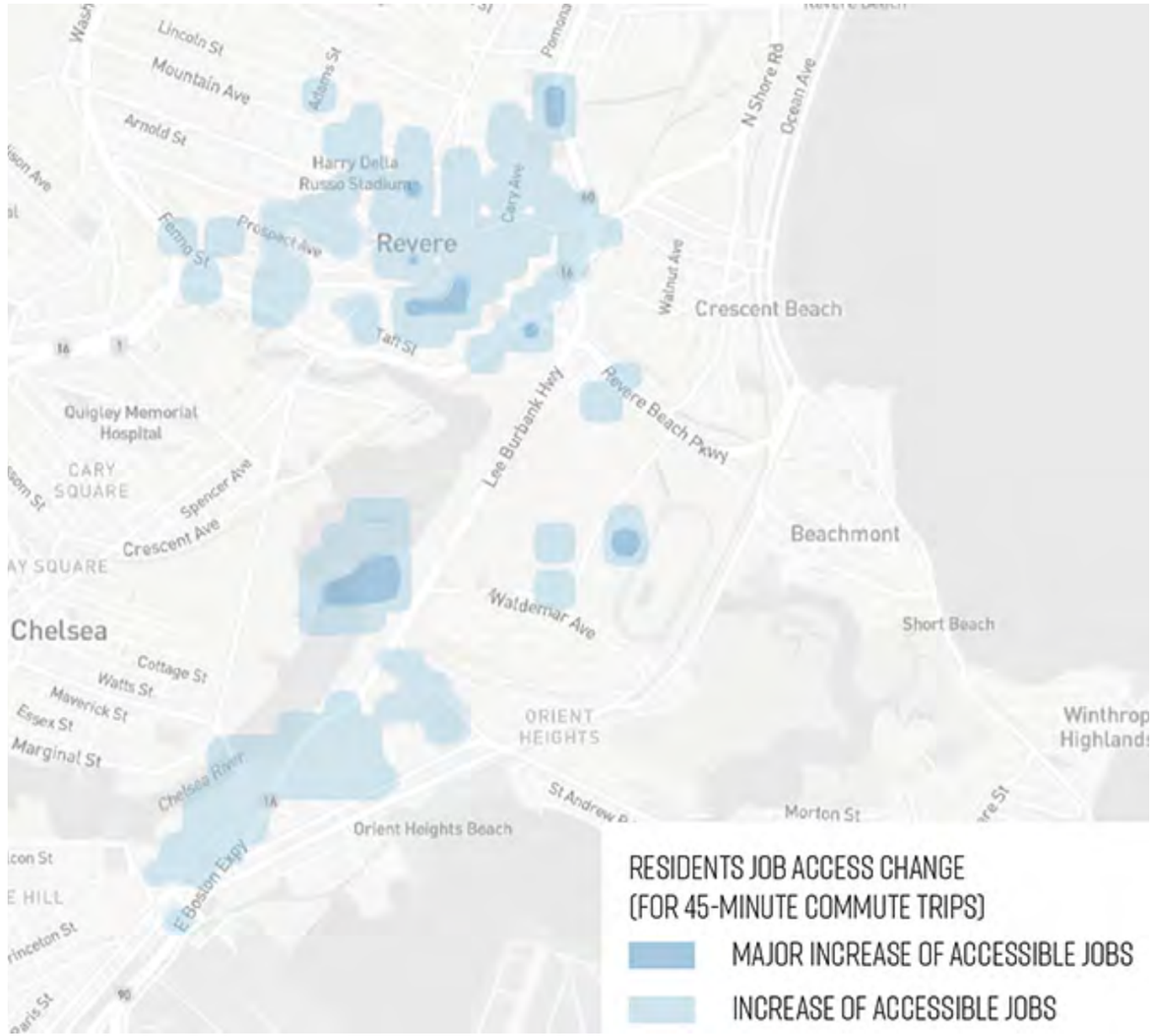


Figure 3–33. Change in Access to Potential Work Sites within the Vicinity of the Study Corridor for Workers with Morning Commutes under 45 Minutes (Source: Conveyal, US Census 2018 LEHD Dataset, OpenStreetMap, MBTA)

From an economic development perspective, the Shared Use Path would allow more regional workers to reach local job sites faster than they otherwise would; however, the change in accessibility necessarily depends on the specific location being analyzed. The net change in multimodal accessibility to a given work site within the vicinity of the study corridor is shown in Figure 3–33, with blue reflecting an access benefit for jobs sited in the colored area. In addition to the areas shown in East Boston near the McClellan Highway and Suffolk Downs EDAs and on the peninsula, worker access to potential employment opportunities located in the town center of Revere would be greatly enhanced, regardless of their home location.

Residential Access to Regional Shared Use Path Network

This analysis discusses how many current residents near the study corridor would benefit from implementing the Shared Use Path included in each alternative. Based on an assessment of 2020 Decennial Census block group data and a ¼-mile distance, Table 3–13 and Figure 3–34 show changes in access to the regional trail network for three scenarios.

1. Baseline (solid, light green lines)
2. With Suffolk Downs mitigation (dashed, light green lines)
3. With the proposed Shared Use Path along the rail ROW, which is included in both alternatives (solid, dark green lines)

Both alternatives would provide access to a new shared use path facility. Residents located near the northern end of the study corridor would benefit in the form of new access to the existing regional trail network, which is currently anchored by the East Boston Greenway located to the south. For those living at the southern end of the study corridor, the proposed Shared Use Path would primarily serve to enhance access to the existing regional trail network.

While both groups would benefit in the near-term from the proposed path's tie-ins with existing facilities in Chelsea and East Boston, the path's long-term potential lies in its ability to extend access to the existing and planned facilities located in East Boston near Day Square to the communities of Revere and Chelsea.

Approximately 47,200 residents live within a ¼-mile distance of the existing East Boston Greenway Connector, Chelsea Greenway or Revere Beach. With Suffolk Downs mitigation, the Shared Use Path proposed along the east side of Route 1A from Addison Street to Tomasello Drive would grant new access to approximately 9,400 people, with a relatively even share of benefits for both Boston and Revere.

If implemented, the Shared Use Path proposed in both alternatives would generate new access to the regional trail network for over 6,700 residents, all of whom would reside in Revere.

Although no "new access" benefits would accrue for those living in Boston, the proposed Shared Use Path would function as a robust extension of the existing and planned network that will be anchored in Day Square near the southern end of the study corridor.

Table 3–13. Number of Residents with Access to a Shared Use Path within a ¼-Mile Distance (Source: US Census Bureau's 2020 Decennial Census Block Groups)

2020 POPULATION	*EXISTING NETWORK*	*WITH SD MITIGATION*	*WITH SHARED USE PATH (BOTH ALTS.)*
BOSTON	25,624	4,860	--
CHELSEA	11,935	--	--
REVERE	9,648	4,553	6,733
Total	**47,207**	**9,413**	**6,733**

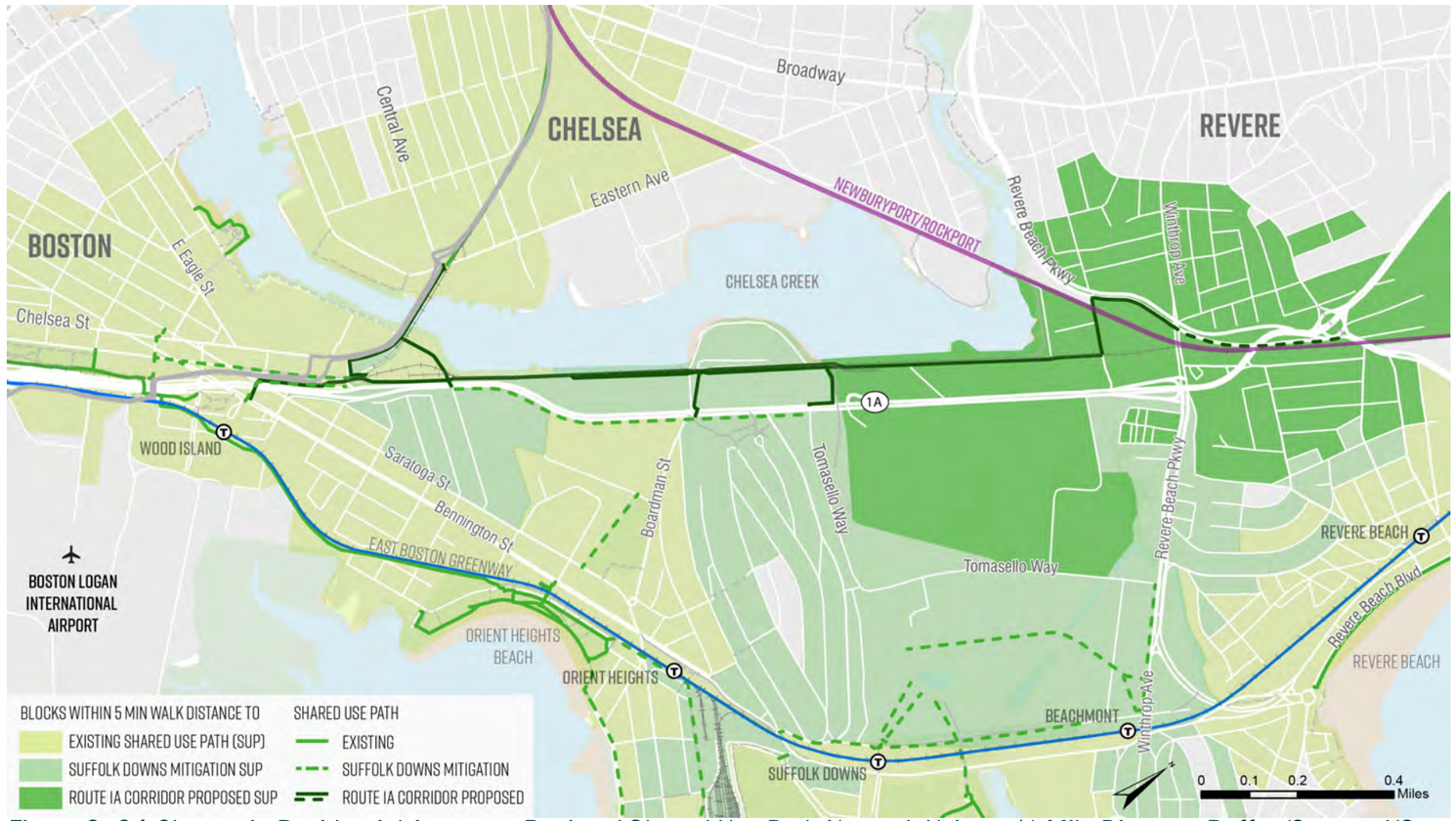


Figure 3–34. Change in Residential Access to Regional Shared Use Path Network Using a ¼-Mile Distance Buffer (Source: US Census 2020 Decennial Census Block Groups)

3.4.3. Environment, Sustainability and Climate Change Resilience

Flood Mitigation / Heat Island

Permeable surfaces allow water to percolate into the soil to filter out pollutants and recharge the water table. Large areas of impermeable surfaces can contribute to flooding, as well as the urban heat island effect. As shown in Figure 3–35, the rail parcel features a total area of 12.10 acres, of which approximately nine percent (1.09 acres) is currently used as paved parking area.

As shown in Table 3–14, the Bypass Road with Shared Use Path Alternative would result in a greater proportion of the rail parcel occupied by impermeable materials, with a nearly even split between areas devoted to impermeable roadway pavement (3.24 acres or 26.8 percent) and those incorporating green spaces (3.50 acres or 28.9 percent). With the Shared Use Path Only Alternative, just under half of the rail corridor (5.49 acres or 45.4 percent) would be occupied by permeable green space.

It should be noted that permeable pavement materials could potentially be used for the Shared Use Path to help preserve water infiltration opportunities in this flood-prone corridor. If permeable pavement was used along the Shared Use Path element, Alternative 1 would feature a permeable surface for nearly all of its area (90.6 percent of total area), while about two-thirds (64.7 percent) of the corridor would be permeable for Alternative 2.

Table 3–14. Number of Residents with Access to a Shared Use Path within a ¼-Mile Distance (Source: US Census Bureau's 2020 Decennial Census Block Groups)

ELEMENT / SURFACE TYPE	BASELINE	ALTERNATIVE 1 SHARED USE PATH	ALTERNATIVE 2 BYPASS ROAD & SHARED USE PATH
Sea Wall	-	1.14	1.04
SUP Area	-	8.85	5.45
Path	-	3.35	1.94
Green Space	-	5.49	3.50
Path (structure)	-	-	0.56
Road Surface	-	-	3.24
Other Impermeable	1.09	-	-
Total Impermeable Surface (If Path Pavement Is Impermeable)	1.09 (9.0%)	4.49 (37.1%)	6.22 (51.4%)
Total Impermeable Surface (If Path Pavement Is Permeable)	1.09 (9.0%)	1.14 (9.4%)	4.27 (35.3%)
Total Rail Parcel Area	**12.10**	**12.10**	**12.10**

Figure 3–35.MBTA Rail Parcels and Permeable Surfaces in the Study Area

Flood Protection

As shown in Figure 3–36 and Figure 3–37, both alternatives provide shoreline flood protection to mitigate anticipated impacts of future flood events given 2070 projections of sea level rise.

In both alternatives, the northern half from Tomasello Drive to Railroad Street would be protected by a raised Shared Use Path (elevated to an absolute height of 16 feet above sea level) that also includes an extra two-foot vertical lip / sea wall along the waterfront edge.

For the southern part from Addison Street to Boardman Street, in Shared Use Path Only alternative, the whole alignment would be a combination of seawall and raised shared-use path / berm. The flood barrier alignment in the Bypass Road with Shared Use Path Alternative would be raised road with sea wall at Addison Street. On north side of Addison Street, the raised Bypass Road would need to be lowered to allow truck access to freight companies in adjacent parcels. Given the limited width, the seawall would be the only protection for about 1,800 feet north of Addison Street. The rest of the segment to Boardman Street would be protected via a raised road with sea wall.

Figure 3–36. Proposed Flood Barriers – Shared Use Path Only Alternative

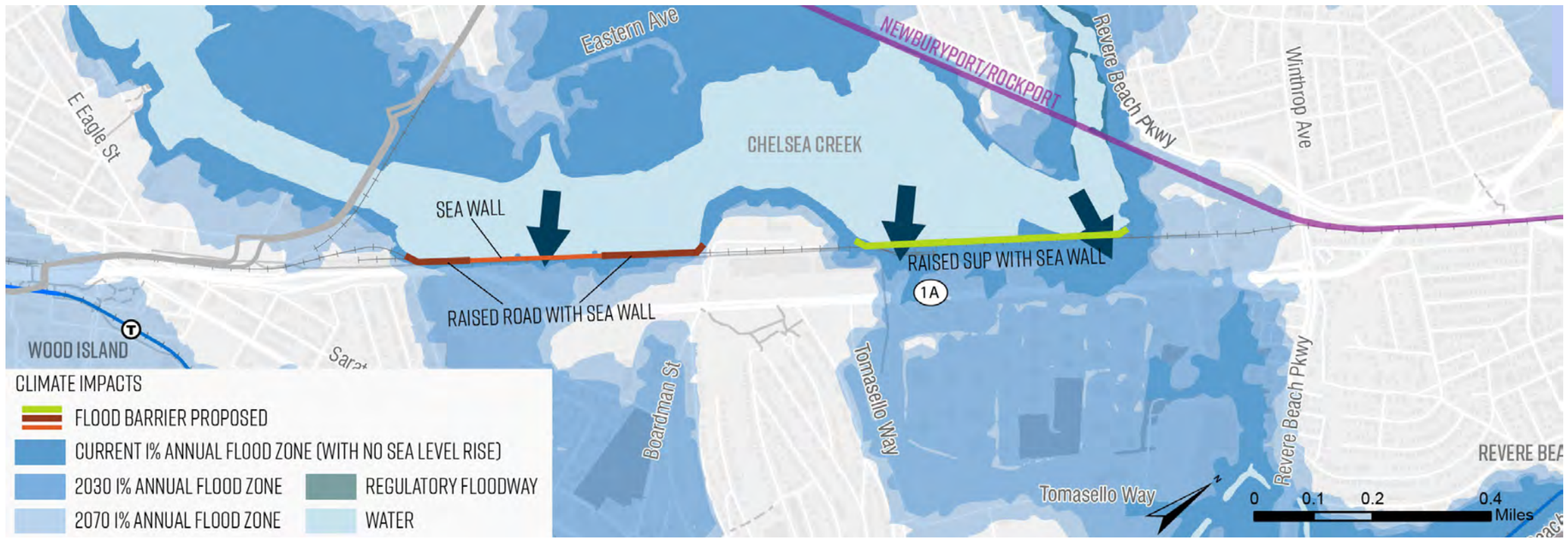


Figure 3–37. Proposed Flood Barriers – Shared Use Path Only Alternative

Environmental Impact

Noise

The FHWA and FTA publish technical guidance to evaluate the impacts of noise and vibration in highway and transit operating environments.[1,2] It is unusual for vibration from sources such as buses and trucks to be perceptible, even in locations close to major roads. Residential disturbance from vibration typically occurs at 70 vibration decibels (VdB) for frequent events such as trucks passing. However, if the roadway is fairly smooth, the vibration from rubber-tired traffic like buses and trucks is rarely perceptible because the typical vibration level realized (65 VdB) reflects the lower limit / threshold for auditory perception in humans.[3] Therefore, this section will focus on noise impacts.

Traffic noise is evaluated for its impact on specific land uses classified as “sensitive receptors,” which includes residences, schools, hospitals, and places of worship. Large trucks are a major source of noise along Route 1A. Beyond a standard reference distance of 50 feet from the noise source, the FTA manual indicates that an additional 1,000 feet of separation allows for a reduction in noise levels from

1 https://www.fhwa.dot.gov/environMent/noise/regulations_and_guidance/polguide/polguide04.cfm
2 https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/research-innovation/118131/transit-noise-and-vibration-impact-assessment-manual-fta-report-no-0123_0.pdf
3 Ibid

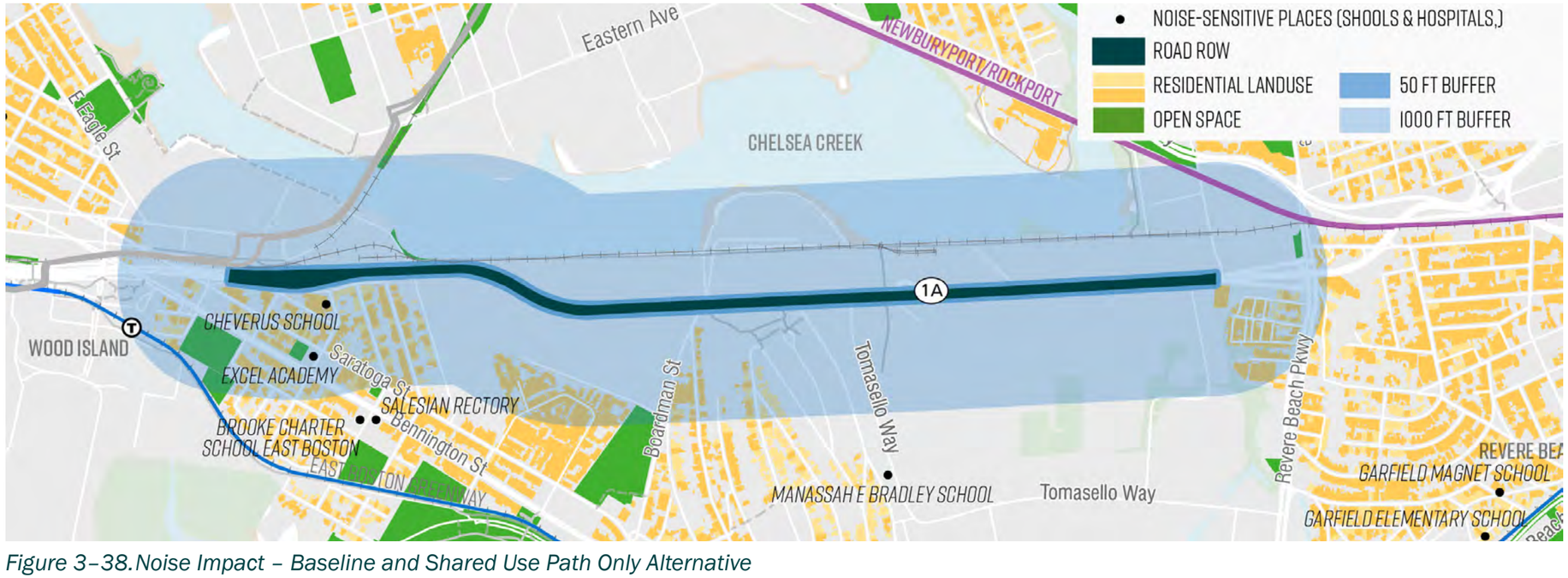


Figure 3–38. Noise Impact – Baseline and Shared Use Path Only Alternative

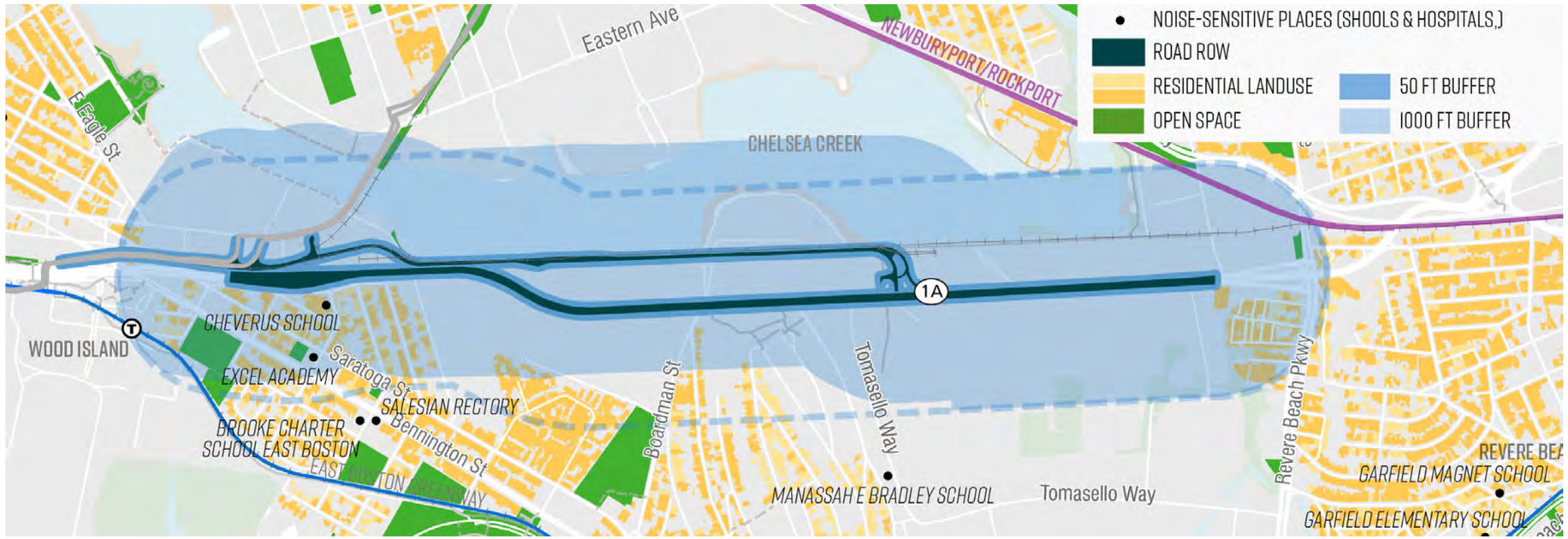


Figure 3–39. Noise Impact – Bypass Road with Shared Use Path Alternative

90 to 70 dB. According to one study, the four-fold reduction in noise levels felt when moving from 90 to 70 dB is similar to swapping a diesel-based truck for a standard passenger car.[4] Therefore, this study uses a 1,000-foot distance around the roadway corridor to determine the extent to which a shift in truck volumes influences noise impacts.

For the Shared Use Path Only Alternative, truck-related noise would continue to result from trips that take place along the Route 1A roadway corridor itself. As shown in Figure 3–38 and Figure 3–39, noise sensitive receptors within the 1,000-foot distance of the roadway corridor, include residences and two schools, the Cheverus School on Moore Street, which is located less than 200 feet east of the roadway corridor, as well as Excel Academy, which is located further to the east.

The Bypass Road with Shared Use Path Alternative would result in the diversion of 35 percent of truck-related traffic from Route 1A to the Bypass Road further to the west, which could result in modest reductions in truck noise at the two schools, as well as the residential areas located on the east side of Route 1A towards the southern end of the corridor. However, with 65 percent of truck trips still remaining along Route 1A, it is expected that truck-related noise would continue to occur adjacent to the existing roadway corridor.

For potential path users, the Shared Use Path Only Alternative would provide a path experience that is relatively shielded from truck-related noise. However, in the Bypass Road with Shared Use Path Alternative, the transfer of 35 percent of Route 1A truck trips to a new roadway adjacent to the path would introduce a considerable degree of truck-related noise to path users that would otherwise not occur with Alternative 1.

Areas of Critical Environmental Concern

Neither of the alternatives would present impacts to the Areas of Critical Environmental Concern that are located east of the Route 1A roadway corridor.

Wetlands

Wetlands are instrumental in combating climate change as they can provide flood protection and offer other benefits, including habitat, water quality improvement, and shoreline erosion control. As shown in Table 3–15, both alternatives would impact wetlands features along Chelsea Creek, including areas classified as tidal flat, coastal beach, rocky intertidal shore and sea cliff.

The Shared Use Path Alternative would affect a total of 0.4 acres of wetlands, for the sea wall feature, new green spaces, the Shared Use Path surface. The Bypass Road with Shared Use Path Alternative would affect an additional approximately 0.6 acres of wetlands for a total of 1.0 acre, and would include an area in the southern half of the rail ROW where the path would need to be supported on a structure over the water to accommodate the proposed Bypass Road.

Under the Bypass Road with Shared Use Path Alternative, the Shared Use Path structure would terminate approximately 1,000 feet south of Boardman Street. Between the end of the structures and Boardman Street, the need for the Shared Use Path to transition to the same level as the raised roadway would result in greater encroachment into wetland areas, adding to the impact from the sea wall and Shared Use Path.

Table 3–15. Estimated Comparison of Affected Wetland Areas by Project Element (Acres)

ELEMENT / SURFACE TYPE	*BASELINE*	*ALTERNATIVE 1 SHARED USE PATH*	*ALTERNATIVE 2 BYPASS ROAD & SHARED USE PATH*
Sea Wall	-	0.18	0.31
SUP Area	-	0.21	0.40
Path	-	0.07	0.13
Green Space	-	0.14	0.27
Path (structure)	-	-	0.30
Road Surface	-	-	0.02
Total	**0**	**0.39**	**1.03**

4 https://www.sandiegocounty.gov/dplu/docs/081024/TM5499-NOISE-T.pdf

Tidelands

The Chapter 91 Waterways Regulations govern activities along Massachusetts waterways, including tidelands, great ponds, and certain rivers and streams. The primary intent of the program is to preserve pedestrian access along the waterfront for the purposes of fishing, fowling, strolling, and navigation. It also protects and promotes the use of tidelands for water-dependent uses like commercial fishing, shipping, marinas and passenger transportation. Chapter 91 requires non-water dependent uses to provide greater benefits than detriment to the public's rights in tidelands. Beyond simply preserving the right to fish, fowl, and navigate, the Chapter 91 licensing process has been used to obtain public benefits from non-water dependent projects, including pedestrian and waterfront walkways, new parkland, and interpretive signage.

Since the majority of the Chelsea Creek shoreline is currently inaccessible from the existing public ROW, a waterfront Shared Use Path in either alternative would constitute a net public benefit despite representing a fundamental change in the use of Chapter 91 tideland areas.

As shown in Figure 3–40 and Figure 3–41, approximately 55 percent of the existing rail ROW's length occupies a Chapter 91 tideland area. At the northern end of the rail ROW, both alternatives would utilize Chapter 91 resources to afford new flood protection and grant the public new access to the waterfront via a raised Shared Use Path supported by a seawall. While flood protection and public access benefits would also be realized in the southern half of the rail ROW under either alternative, Alternative 2's introduction of vehicular traffic (adjacent to the proposed Shared Use Path) would not constitute a water-dependent use and would serve to comparatively diminish the net public benefit derived from the new Shared Use Path facility.

Since implementation of the Shared Use Path and sea wall elements of each alternative would entail work within tideland areas, including the placement of new structures, filling, and/or dredging, both alternatives would have impacts to tidelands areas regulated under Chapter 91. In either case, the project proponent would need to obtain authorization from MassDEP in the form of a Waterways License to implement the project.

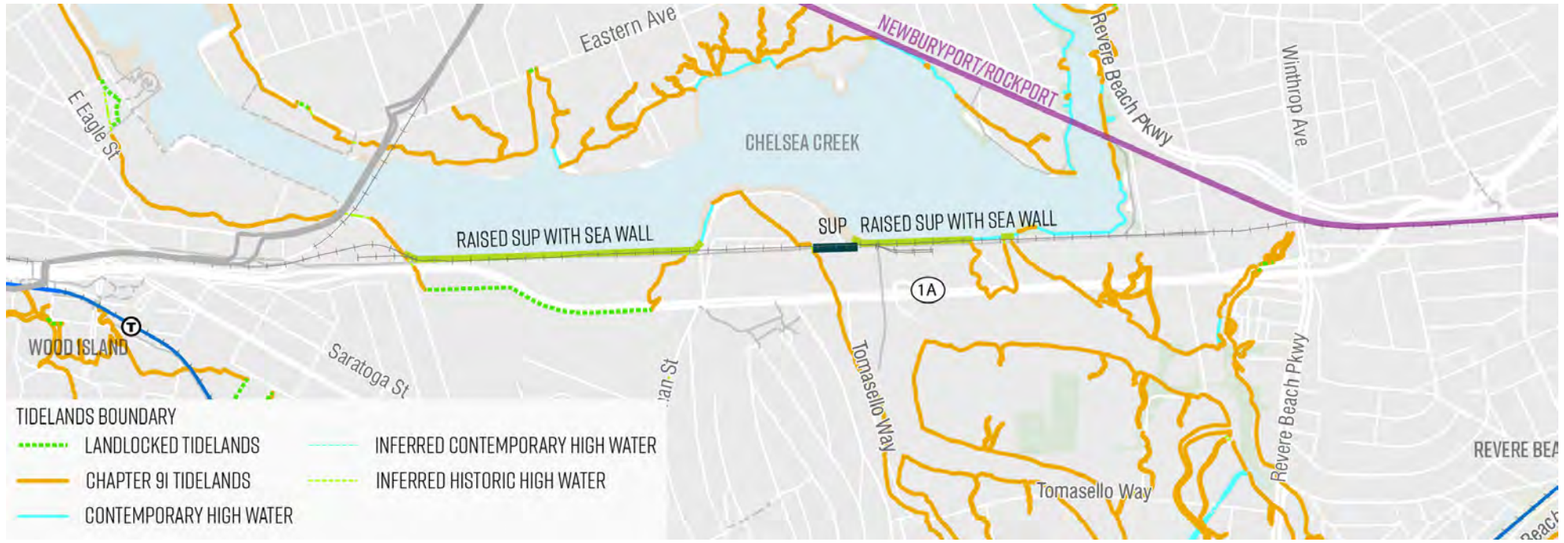


Figure 3–40. Tidelands Water-Dependent Uses – Shared Use Path Only Alternative

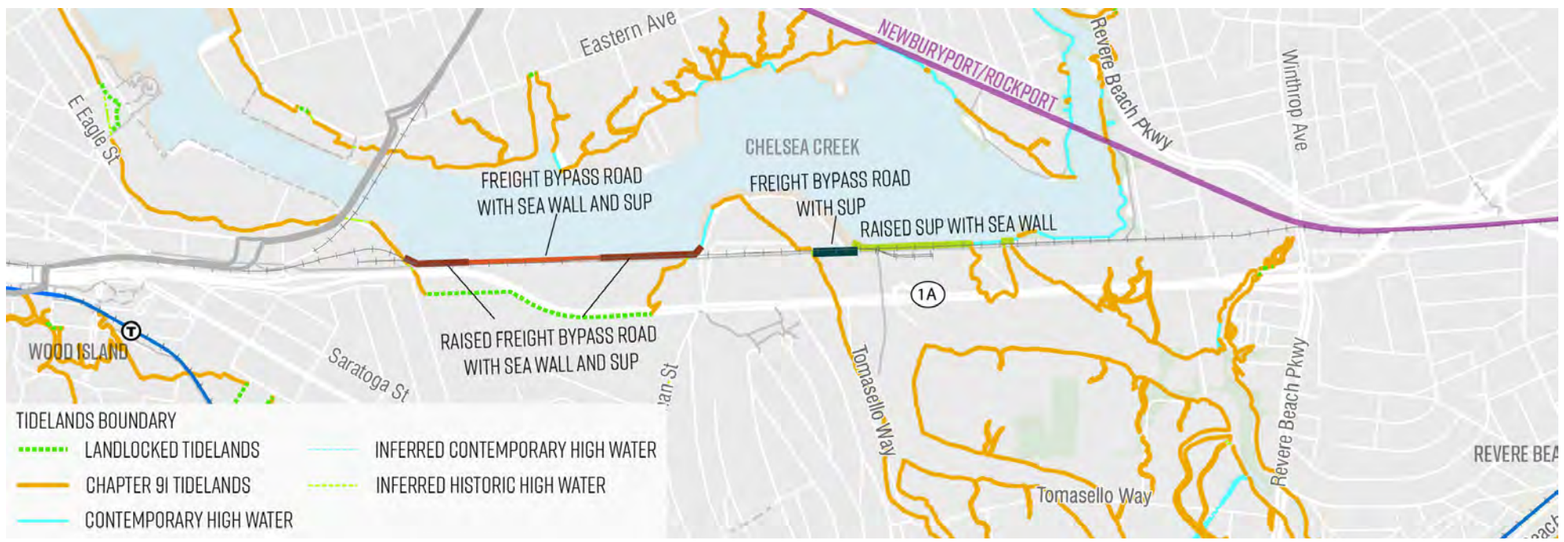


Figure 3–41. Tidelands Water-Dependent Uses – Bypass Road with Shared Use Path Alternative

Hazardous Materials

In accordance with M.G.L Chapter 21E and the procedures established within the Massachusetts Contingency Plan (MCP) (310 CMR 40.0000), any releases of oil and/or hazardous material into the Commonwealth's environment must be reported to the MassDEP's Bureau of Waste Site Cleanup (BSWC) and subsequently managed under the supervision of a Licensed Site Professional (LSP).

Using data from MassGIS, Table 3–16 and Figure 3–42 show locations adjacent to the rail ROW where an Activity Use Limitation (AUL) has been filed. This legal document serves as formal notice to the public that some degree of oil and/or hazardous materials (OHM) contamination persists at the site, even after cleanup measures were implemented. An AUL outlines which activities and uses of the site are permitted, as well as the owner's obligation and maintenance conditions that will allow for continued safe use of the property. It should be noted that sites with an AUL represent only a subset of the total reported release sites tracked by MassDEP BWSC.

Given the abandoned railbed's history as transportation corridor that supported industrial activities at adjacent sites, ground disturbances within or adjacent to the rail ROW entail the potential to encounter OHM and solid waste. Potential impacts include encountering contaminated soils or groundwater; disposing of contaminated materials; and disposing of solid waste containing lead-based paint, asbestos, or other regulated materials.

Although such a (non-zero) potential to encounter OHM and solid waste would exist in each alternative, the likelihood of encountering OHM and solid waste en route to implementing Alternative 2 would be greater than in Alternative 1 as a result of the more extensive and intensive physical work required to functionally support the proposed Bypass Road (e.g., comparatively wider area disturbed in general, greater depths of excavation required in some areas to incorporate Bypass Road's drainage fixtures). This is particularly true where ground disturbances would occur within, through or near land parcels where AULs have already been defined (e.g., area just south of Addison Street near 150 McClellan Highway, private parcels south of Boardman Street at 290, 310 and 370 McClellan Highway).

Table 3–16. Oil and/or Hazardous Materials Release or Disposal Sites with an Activity Use Limitation

RTN	ADDRESS	STATUS	CLASS	RAO DESCRIPTION	CURRENT USE
3-0003837	150 MCCLELLAN HWY	RAO	B2	No Significant Risk Contingent on AUL	CubeSmart (South of Curtis)
3-0021897	290 MCCLELLAN HWY	RAO	B2	No Significant Risk Contingent on AUL	Bradford Airport Logistics (South of Boardman Street)
3-0000526	310 & 370 MCCLELLAN HWY	RAO	B1	No Significant Risk	Skema Courier (South of Boardman Street)
3-0024813	480 MCCLELLAN HWY	RAO	A3	Permanent AUL Implemented	Logan Cargo Park (Tomasello Way)
3-0018331	96 LEE BURBANK HWY	RAO	–	–	Intermodal Fuel Supply Lines (North of Jughandle)
3-0013585	96 LEE BURBANK HWY	RAO	A3	Permanent AUL Implemented	Intermodal Fuel Supply Lines (North of Jughandle)
3-0014835	140 LEE BURBANK HWY	TMPS	TN	–	Intermodal Fuel Supply Lines (North of Jughandle)
3-0018008	222 LEE BURBANK HWY	RAO	–	–	Hampton Inn (South of Railroad Street)
3-0017863	20 RAILROAD ST	RAO	A3	Permanent AUL Implemented	Capitol Waste Recycling (Railroad Street)
3-0003775	WHARF RAILROAD ST	RAO	A3	Permanent AUL Implemented	Solar Farm (Railroad Street)

Figure 3–42. OHM Release or Disposal Sites with an Activity Use Limitation

In either case, to further assess the potential for encountering OHM, Phase I Environmental Site Assessments (ESAs) should be performed to identify Recognized Environmental Conditions (RECs) associated with properties along or adjacent to the rail ROW to the extent feasible pursuant to ASTM 1527-05 in accordance with 40 CFR Part 312. The scope of such Phase I ESAs would entail the following:

- Searching federal and state files and databases concerning contamination and environmental risk;
- Reviewing MassDEP files, as necessary, to yield additional information concerning ownership, site usage, prior storage and disposal of OHM on or adjacent to the area;
- Reviewing local records and files to supplement the federal and state-level searches; and
- Reviewing other documents related to the site (e.g., prior ESA).

Restore or Improve Access to and Use of Natural Resources

Currently the shoreline is not open to public access. Both alternatives seek to restore and improve access to natural resources and provide access to waterfront space for public use. In as much as the shoreline would be re-opened to public use under both alternatives, the Shared Use Path Only Alternative would provide a comparatively more pleasant sensory experience of these restored or improved natural resources, eliminating the auditory, visual, and olfactory interference otherwise associated with vehicle operations along a bypass road.

As shown in Table 3–17 and Figure 3–43, Alternative 1 would offer more accessible open spaces and access points, as well as greater ease of access between the new facility and other public right-of-way compared to the Bypass Road with Shared Use Path Alternative. In Alternative 2, path users would need to cross the Bypass Road to reach other segments of the public right-of-way, thereby increasing potential exposure for those crossing the paths of oncoming vehicles.

The most prominent difference would be at Curtis Street, where Alternative 1 would allow users moving between points south (e.g., Mary Ellen Welch Greenway Extension) and the proposed waterfront path to pass beneath the bridge. Within the confines of the existing bridge, Alternative 2 would require pedestrians and cyclists to cross Route 1A at-grade in an area with high volumes of heavy vehicles in order to accommodate the Bypass Road.

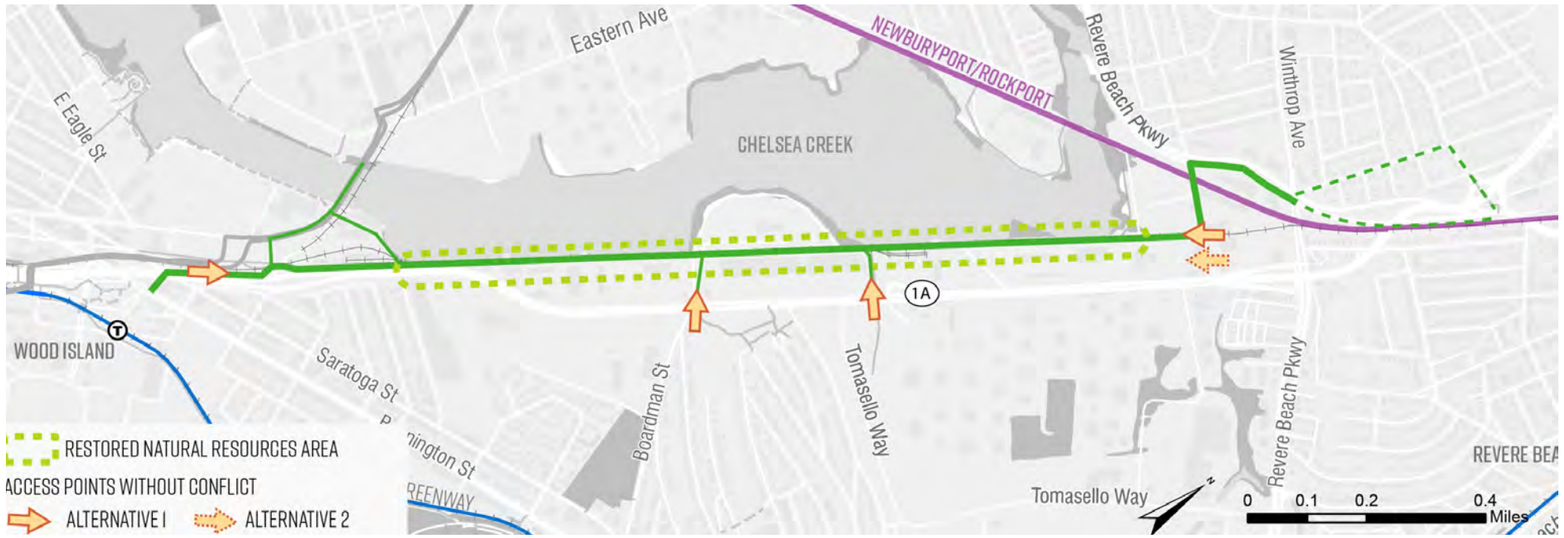


Figure 3–43.Access Points Without Conflict for Alternative 1 and 2

Table 3–17. Comparison of Access to and Use of Natural Resources

ACCESS METRIC	*BASELINE*	*ALTERNATIVE 1 SHARED USE PATH*	*ALTERNATIVE 2 BYPASS ROAD & SHARED USE PATH*
New Accessible Open Spaces (Acres)	–	8.85	5.45
Access Points to Open Spaces	–	4 without vehicular conflicts	1 without vehicular conflicts
Ease of Access	No access for public	Easy	Medium

3.4.4. Equity

Truck Impact on Noise & Air Quality

The proposed Bypass Road in Alternative 2 represents a key difference between the two alternatives. Many of the key tradeoffs can be distilled to the improved freight access and connectivity offered by the Bypass Road in Alternative 2 against the more extensive and less constrained shared use path design with lower noise and air quality impacts for path users (from the lack of trucks) in Alternative 1.

One of the key benefits offered by Alternative 1 is the Shared Use Path's distance from Route 1A's noise and pollution. This lateral distance between these two facilities is 400 feet in some locations. In Alternative 2, this distance would be much closer – on the order of 10 to 30 feet from the Bypass Road, and in some cases less – throughout much of the proposed corridor. However, by shifting some truck traffic to the Bypass Road, Alternative 2 would reduce the noise and air quality impacts from Route 1A to residences and other sensitive receptors near Route 1A, including two schools near the southern end of the corridor.

As shown above in the truck volume projections for the Bypass Road, the morning peak hour truck volume is projected to be roughly 109 trucks per hour, and the evening peak hour truck volume is projected to be roughly 103 trucks per hour. Assuming a "worst case" peak hour truck volume of 120 equates to a truck passing approximately every 30 seconds. A summary of typical noise levels found that **a diesel truck passing at a distance of 150 feet is perceived as four times as loud as a passenger car traveling at 65 mph measured from a distance of only 25 feet.**[1] While truck speeds along the Bypass Road were estimated to average 15 miles per hour, there is the potential for increased noise levels during acceleration along the corridor due to stops and starts.

To mitigate noise impacts to shared path users, the design proposes to elevate the Shared Use Path over the proposed Bypass Road where possible. There would also be opportunities to use sound-dampening materials where possible.

Shared use path users would likely also be impacted by truck emissions. Despite the low peak hour volumes, truck emissions – especially during acceleration – would be noticeable in Alternative 2, as compared to the lack of an adjacent Bypass Road in Alternative 1.

Due to the project's implementation timeline, electric trucks may be more prevalent by the time the proposed facility opens. These vehicles would likely be quieter and would have significantly fewer emissions than combustion-fueled heavy vehicles.

1 https://www.sandiegocounty.gov/dplu/docs/081024/TM5499-NOISE-T.pdf

Public Health

Key public health benefits of both Alternative 1 and 2 would stem from the Shared Use Path's ability to facilitate physical activity, which would contribute to positive health outcomes for path users, as well the access it would provide to new designed green spaces along the study corridor. With the abundance of commercial and other impervious land uses throughout the corridor, the introduction of these green spaces would help mitigate the impacts of sea-level rise and create publicly accessible open spaces for communities that currently have few.

The study corridor is home to a number of Environmental Justice populations. Essentially every neighborhood in the broader study area satisfies the minority criterion, with minority and low-income communities near Bell Circle and along the southern segment of the corridor, and minority and Limited English Proficiency communities near Day Square. Currently, these EJ communities lack access to Shared Use Path (SUPs), Separated Bike Lanes (SBLs), and neighborways that connect to other neighborhoods. For access points leading to existing bike and pedestrian path, these are middle-high to high stress pedestrian crossings (Figure 3–44). As depicted in Figure 3–45 and Figure 3–46, both Alternative 1 and Alternative 2 would add SUP along the study corridor providing connections between EJ communities in Revere, East Boston, and Chelsea, and improve access to SUP and green spaces. Alternative 1 would create a greater amount of accessible green spaces and more low-stress access points.

Alternative 1 would create 5.49 acres of designed green spaces while Alternative 2 would create 3.5 acres of designed green spaces, with green space along Chelsea Creek narrower or removed at certain points to accommodate a Bypass Road within the limited width of rail parcels, a notable trade-off between the alternatives.

For access points, Alternative 1 would have significant improvement for EJ communities on south end of the corridor, with both crossings at Curtis Street and Addison Street improved to low to middle-low stress crossings. Alternative 2 would add crossing points along the Bypass Road, while all the newly added crossings are low stress for pedestrians, Alternative 1 would have fewer potential conflict between pedestrian/bikes from EJ communities with trucks.

In addition to varying amounts of total green space and access point stress levels, access to the Shared Use Path and green space in both alternatives could be complicated by steep grades within the existing rail ROW and conflicts between path users and Bypass Road vehicles. To overcome steep grades, care must be taken to ensure access points remain accessible,

especially for those with limited mobility. This is important to consider in the access point in Alternative 1 at Curtis Street, where the path utilizes the existing bridge underpass. Traveling to Curtis Street from the underpass requires a considerable incline. Additionally, in both alternatives, the grades on both approaches to the MBTA Commuter Rail crossing / Railroad Street bridge must also be considered, especially relative to the vertical clearance needed for passenger trains below. To overcome steep grades and improve the safety and comfort of path users, both alternatives include raising the Shared Use Path and Bypass Road to cross Boardman Street at-grade.

While raising the path to create at grade intersections improves accessibility, it also introduces additional conflict points between path users and vehicular traffic, which could limit perceived and actual safety and reduce the comfort of the path for the surrounding community. In addition to the intersection of Boardman Street, in Alternative 2, path users would be required to cross over the Bypass Road at Addison Street and navigate a newly signalized intersection at Curtis Street.

3.4.5. Feasibility

Capital Cost

Using the concept-level design plans and cross-sections developed within this study, a team of civil and structural engineers generated order-of-magnitude capital cost estimates for each of the two alternatives and their sub-options (Table 3–18). A summary of the capital cost estimation process, its considerations, and specific items included is outlined below. For further information, please see Appendix COSTS.

- Shared use path was quantified at a high level and replicated across the four variations, with some minor modifications; path would include pedestrian-scale lighting every 50 feet and trees every 10 feet (e.g., one-sided, or alternating sides every 20 feet)
- Security cameras and blue safety lighting were quantified in specific areas away from the main streets adjacent to Chelsea Creek
- A soil contamination and disposal allowance ($1,500,000) was applied to reflect the uncertainty of conditions along a railbed adjacent to legacy and ongoing industrial uses
- Design contingencies were applied for police detail (10 percent), utilities

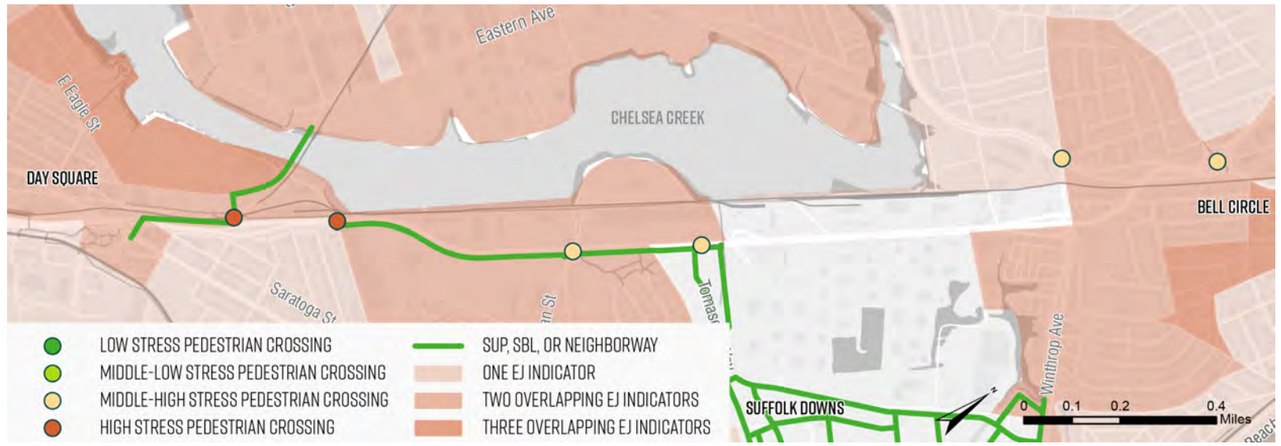


Figure 3–44.Shared Use Paths, Separated Bike Lanes and Community Access for Baseline

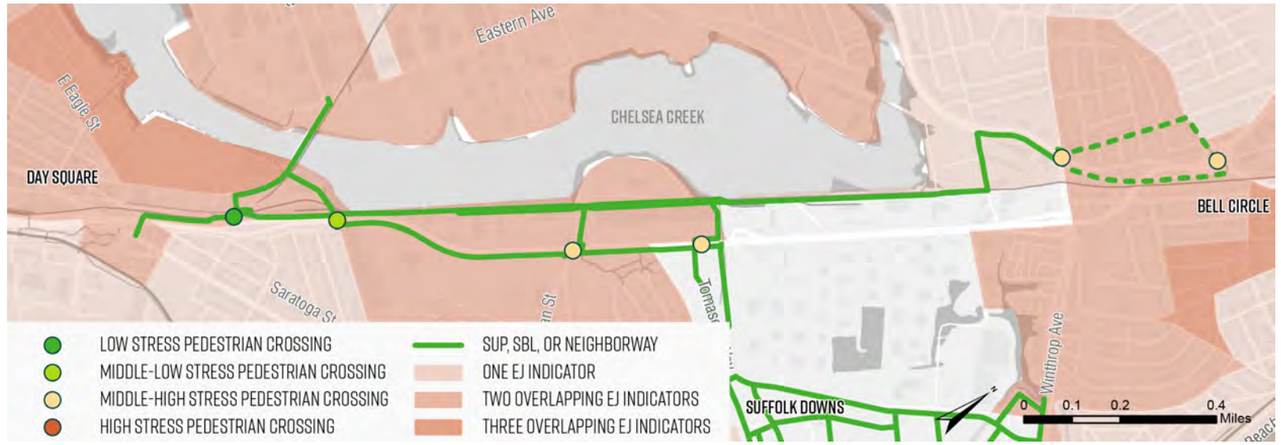


Figure 3–45.Shared Use Paths, Separated Bike Lanes and Community Access for Alternative 1

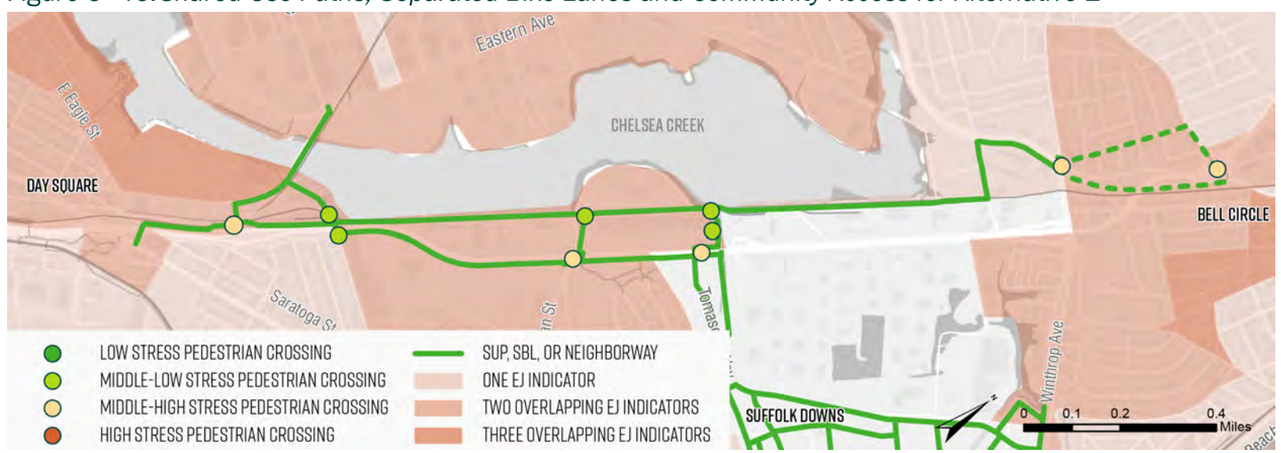


Figure 3–46.Shared Use Paths, Separated Bike Lanes and Community Access for Alternative 2

(20 percent), design (40 percent), and construction (40 percent) based on percentages from previous projects

- For the majority of items, unit prices were obtained from MassDOT Highway Division's Construction Project Estimator's Weighted Bid Prices tool
- Unit prices for bridge and cantilever sections were provided by structural engineers based on previous projects
  - Railroad Street bridge over the active MBTA Newburyport / Rockport Commuter Rail tracks estimated at $1,000,000 (250 feet long by 20 feet wide)

Table 3–18. Estimated Capital Cost by Alternative and Option ($2022)

MAINLINE ALTERNATIVE	*ALTERNATIVE 1 SHARED USE PATH*	*ALTERNATIVE 1 SHARED USE PATH*	*ALTERNATIVE 2 BYPASS ROAD & PATH*	*ALTERNATIVE 2 BYPASS ROAD & PATH*
BELL CIRCLE APPROACH	*A (HARRIS ST)*	B (REVERE BEACH PKWY)	*A (HARRIS ST)*	B (REVERE BEACH PKWY)
Shared Use Path	11,903,100	11,948,540	11,768,310	11,803,820
Traffic Controls	270,000	270,000	600,000	600,000
Cantilever Walkway along Creek	--	--	10,137,600	10,137,600
Bypass Road	--	--	6,500,000	6,500,000
Seawall Sections	19,947,000	19,947,000	19,947,000	19,947,000
Railroad St Bridge	1,000,000	1,000,000	1,000,000	1,000,000
CONSTRUCTION SUBTOTAL	**33,120,100**	**33,165,540**	**49,952,910**	**49,988,420**
10% Police Detail	3,312,010	3,316,554	4,995,291	4,998,842
20% Utilities	6,624,020	6,633,108	9,990,582	9,997,684
40% Design Contingency	13,248,040	13,266,216	19,981,164	19,995,368
40% Construction Contingency	13,248,040	13,266,216	19,981,164	19,995,368
Soil Disposal Allowance	1,500,000	1,500,000	1,500,000	1,500,000
TOTAL CAPITAL COST	**71,052,210**	**71,147,634**	**106,401,111**	**106,475,682**

Two intriguing results were found in comparing the alternatives and options amongst each other. The primary driver of the cost increase between Alternative 1 and Alternative 2 is not the material costs associated with developing the Bypass Road itself, but rather the need to cantilever the proposed Shared Use Path over Chelsea Creek (Figure 3–6) along a 4,200 foot segment of limited right-of-way between Addison and Boardman Streets ($10.138 M).

Barring any unforeseen discoveries of hazardous materials or contamination in one area that are not present in the other, the proposed Shared Use Path would be long enough such that the change in capital investment needed to create a two-way separated bike lane along the northbound direction of Revere Beach Parkway (Option B), as opposed to developing a mixed-traffic conduit along Harris Street via new sharrows, curb extensions, and access control (Option A), would be insignificant (i.e., less than a one percent variation in construction costs related to the Shared Use Path).

Permitting

Creating new public access and implementing flood protection along the shoreline could require some fill in regulated areas associated with Chelsea Creek. Absent the acquisition of private parcels lying immediately east of the state-owned rail corridor, which could potentially allow for flood protection elements that better tie-in with the top of the shoreline slope for both alternatives, the seawall sections would encroach onto the rocky slope. As a result, it is anticipated that either alternative would require the permits or other approvals listed in Table 3–19.

Relative to Chapter 91, the Shared Use Path component included in each alternative would be consistent with the regulatory purpose (provide public waterfront access) and could be considered a net benefit. However, within Alternative 2, the Bypass Road component would be considered a non-water dependent use and result in the entire project being classified as a non-water dependent use. In order to advance a non-water dependent use, the project proponent would be required to demonstrate that the project provides greater benefit than detriment to the public's rights in tidelands.

Since Alternative 1 would generate a net benefit without imposing a comparative cost (i.e., restore public access to the waterfront without converting a portion of Chapter 91 areas into a limited access roadway - a non-water dependent use), it would be relatively easier to successfully advance through the current coastal regulatory environment.

Furthermore, although such a (non-zero) potential to encounter OHM and solid waste would exist for either alternative, the likelihood of encountering OHM and solid waste en route to implementing Alternative 2 would be greater than in Alternative 1. This is due to the more extensive (comparatively wider area disturbed in general)

and intensive (greater depths of excavation in some areas to incorporate drainage and other fixtures) physical work that would be required to functionally support the proposed Bypass Road. This is particularly true where ground disturbances would occur within, through or near land parcels where AULs have already been defined (e.g., area just south of Addison Street near 150 McClellan Highway, private parcels south of Boardman Street at 290, 310 and 370 McClellan Highway).

At the state level, since this project would involve changes to wetland areas and would also take place adjacent to Low-Income areas, a formal filing under the Massachusetts Environmental Policy Act (MEPA) would be necessary. It is anticipated that this project would require an Environmental Notification Form under MEPA, but not require an Environmental Impact Report. Funding or other action by FHWA or another federal agency would require compliance with the National Environmental Policy Act (NEPA). Given the nature of the work required to implement either alternative, an Environmental Assessment would likely be the most appropriate level of analysis in the event NEPA is triggered. In the event that oil and/or hazardous materials are found along the study corridor, then the project would be subject to oversight from the U.S. Environmental Protection Agency as required under the 1976 Resource Conservation and Recovery Act.

Table 3–19. Anticipated Environmental Permits or Approvals Required

AGENCY WITH JURISDICTION	*PERMIT OR DECISION NEEDED*
MA Executive Office of Energy and Environmental Affairs	Massachusetts Environmental Policy Act (MEPA) Review
MA Office of Coastal Zone Management	Coastal Zone Consistency Concurrence*
MA Department of Environmental Protection	Section 401 Water Quality Certification Chapter 91 Waterways Program (Tidelands) License
Boston Conservation Commission	Massachusetts Wetlands Protection Act Order of Conditions
Federal Agency Granting Funds (Or Otherwise Acting on Behalf of the Project)	National Environmental Policy Act (NEPA) Review
U.S. Army Corps of Engineers	Clean Water Act Section 404 Permit Rivers and Harbors Action Section 10 Permit
U.S. Environmental Protection Agency	National Pollutant Discharge Elimination System (NPDES) Stormwater General Construction Permit

** CZM Coastal Zone Consistency Concurrence and NEPA would be required only if there are federal funds or other actions involved in the project.*

+ USACE River and Harbors Action Section 10 Permit would be required for any structures or work within tidal waters up to Mean High water (MHW).

Future design phases would determine proximity of project limits to MHW.

4. KEY FINDINGS AND NEXT STEPS

This chapter summarizes the key findings and conclusions from the Route 1A Corridor Study. This includes a review of the technical evaluation of Alternative 1, Shared Use Path Only and Alternative 2, Bypass Road with Shared Use Path relative to the study goals, objectives, and evaluation criteria. This chapter discusses some of the most important benefits and impacts of the alternatives relative to the No-Build condition, as well key differences between the alternatives. This report concludes with a discussion of potential next steps that could define and advance a project in the Route 1A study corridor.

4.1. SUMMARY OF ALTERNATIVES AND KEY FINDINGS

This section discusses overall performance of the study alternatives relative to the No-Build condition, and the key differences between the alternatives. A comparative evaluation matrix showing how well Alternatives 1 and 2 address the study's goals and objectives is shown in Table 4–1. The following is a summary of the key features and differentiating factors of the alternatives that will help decision-makers determine a preferred approach for advancing improvements in the study corridor.

- **Safety:** Both alternatives would provide safety improvements relative to the No-Build condition.
  - **Crash Modification Factors.** Both Alternative 1 (Shared Use Path Only) and Alternative 2 (Bypass Road with Shared Use Path) would entail safety improvements at the Curtis Street and Addison Street intersections to address existing safety issues.
  - **Pedestrian and Bicycle Conflicts.** Both alternatives would provide a Shared Use Path with new pedestrian and bicycle access opportunities that have low vehicular conflicts. However, compared to the Shared Use Path Only Alternative, the Bypass Road with Shared Use Path Alternative would introduce potential path user conflicts with Bypass Road vehicles at major access points (e.g., Jughandle near Tomasello Drive, Boardman Street, and Addison Street). In Alternative 2, path users also would have an additional at-grade crossing with vehicles turning on to and off of Route 1A at Curtis Street, while Shared Use Path users would cross using an underpass in Alternative 1.
    - **Northern Options for Pedestrian and Bicycle Access.** Option A would provide on-street bicycle accommodations via Sharrows on Harris Street, a low-volume residential street, along with a limited segment of sidewalk-level bike lane on the southern approach to Revere Beach Parkway. Option B would provide a lower-conflict separated bike path along the Revere Beach Parkway ramp to Bell Circle.
- **Connectivity.** By providing a new Shared Use Path, both alternatives would provide better pedestrian and bicycle connectivity relative to the No-Build condition. By building a new vehicular Bypass Road that enables connections between Route 1A, industrial businesses, and Logan International Airport, Alternative 2 would provide better connectivity for authorized vehicles, including heavy trucks and potentially buses and other vehicles.

- **Truck Connectivity:** The analysis indicates that the Bypass Road proposed in Alternative 2 would attract nearly 1,900 truck trips per day – just under 35 percent of the total truck volume projected for 2040 on Route 1A and from the Cargo Ventures project proposal. AM and PM peak hour truck diversions to the Bypass Road are projected to be 109 (42 northbound, 67 southbound) and 103 (50 northbound, 53 southbound), respectively.
- **Traffic Congestion.** The traffic analysis found that enabling these truck diversions from Route 1A to the new Bypass Road would result in a minor reduction in delay and congestion on Route 1A in Alternative 2.
- **Pedestrian and Bicycle Access.** In both alternatives, the Shared Use Path would enable better access to recreational facilities and natural resources for residents near the study corridor. The Shared Use Path in both alternatives would also provide better non-motorized access for residents to employment opportunities and other destinations.

- **Environment and Resilience:** Both alternatives would improve the environmental and resilience performance for the railroad corridor relative to the No-Build condition.
  - **Flood Protection.** Both alternatives would provide an elevated transportation facility that would serve as a barrier to sea level rise and storm surge for two key neighborhood flood pathways to the north and south of Orient Heights.
  - **Flood Mitigation and Urban Heat Mitigation.** Alternative 1 would provide roughly 3.4 additional acres of green space, because it would not need to provide a paved vehicular Bypass Road in addition to the Shared Use Path. This green space would help mitigate urban heat impacts and would provide additional permeable surface for flood absorption and mitigation.
  - **Environmental Impact.** The Alternative 2 Bypass Road may have greater construction impacts than Alternative 1, such as more disruption of the Chelsea Creek and areas contaminated with hazardous materials.
  - **Access to Natural Resources.** Both alternatives would provide much better access to the Chelsea Creek than the No-Build condition. However, Alternative 1 would provide more waterfront open space and natural resources than Alternative 2.
- **Equity:** By enhancing access to natural resources and recreational facilities, both alternatives would provide equity benefits for residents of the Environmental Justice surrounding the study corridor relative to No-Build conditions.
  - **Truck Impacts on Noise & Air Quality for East Boston Residents.** By enabling the diversion of an estimated 35 percent of trucks from Route 1A to the Bypass Road, Alternative 2 would displace a significant proportion of heavy vehicle-generated noise and air pollution farther from the East Boston residential neighborhoods that are closest to Route 1A.
  - **Truck Impacts on Noise & Air Quality for Shared Use Path Users.** By keeping all trucks on Route 1A rather than on an adjacent Bypass Road, Alternative 1 would keep truck-related noise and air pollution away from the Shared Use Path and the park spaces along Chelsea Creek.
  - **Public Health Benefits:** Alternative 1 would provide more park space and green space along the Shared Use Path, and greater recreational opportunities. The Shared Use Path Only Alternative would also provide a more comfortable, lower-stress experience for non-motorized users, particularly pedestrians, by offering separate pathways for bicyclists and pedestrians from just north of Addison Street (230 McClellan Highway) to just south of the Jughandle (480 McClellan Highway).
- **Feasibility and Implementation:** The No-Build, status quo scenario represents the most "feasible" option, with the fewest challenges. Both alternatives would entail significant capital cost, as well as project impacts that would require significant permitting in this environmentally sensitive waterfront corridor.
  - **Capital Cost.** Both alternatives have significant capital costs for rehabilitating the railroad corridor, raising the profile for flood control, and building the infrastructure associated with the proposed alternative. Alternative 2 is roughly 50 percent more expensive, due to the cost associated with building the Bypass Road in addition to the Shared Use Path, as well as building the cantilevered segment of the Shared Use Path.
  - **Environmental Permitting.** Both alternatives would entail significant permitting related to potential environmental impacts, especially for construction in filled tidelands under Chapter 91 regulations. In addition, portions of the study corridor are within the Chelsea Creek Designated Port Area (DPA); both alternatives would entail new uses in a DPA, whose regulations place restrictions on construction of non-water-dependent uses.

Table 4–1. Summary Evaluation and Key Findings

STUDY GOAL	TYPE OF ANALYSIS	#1 – SHARED USE PATH ONLY	#2 – BYPASS ROAD WITH PATH	KEY FINDING(S)
Safety	Crash Modification Factors	Somewhat Better	Somewhat Better	Both alternatives would improve multimodal safety at Curtis Street and Addison Street. For Shared Use Path users, Alt. 1 would eliminate potential interactions present in Alt. 2 (at-grade crossings, trucks).
Safety	Pedestrian Comfort *	Better than Base	Somewhat Better	Shared Use Path in Alt. 1 would cross beneath Curtis Street; provide a pedestrian – bicycle only corridor with more open space; and enable separation for those walking and biking in select areas.
Safety	Bicyclist Comfort *	Better than Base	Somewhat Better	Both alternatives would provide a continuous Shared Use Path. Alt. 1 would allow a wider biking facility, greater comfort (more distance from vehicles), and separation from the ped path in some segments.
Connectivity	Intersection Operations	Comparable to Base	Somewhat Better	Assuming nearly 35 percent of projected truck traffic (1,870 daily trips) is diverted off the mainline, the Alt. 2 Bypass Road would offer minor traffic congestion & delay reduction benefits for Route 1A drivers.
Connectivity	Truck Volumes (Routing & Travel Time Savings)	Comparable to Base	Somewhat Better	Bypass Road would offer reliability benefits for trucks traveling to and from Logan Airport. Travel times would be shorter during peak periods (SB AM, NB PM), but otherwise comparable to 1A.
Connectivity	Employment Access	Somewhat Better	Somewhat Better	Both alternatives would provide better connections for pedestrians and bicyclists to jobs in Revere, Chelsea, Everett, and Lynn. Access to land uses around Bell Circle and near Day Square would improve.
Connectivity	Non-Motorized Access *	Better than Base	Better than Base	Both alternatives would offer new public access to the shoreline of Chelsea Creek, with a waterfront Shared Use Path serving as a new signature link within the regional trail network.
Environment, Resilience	Flood Mitigation / Heat Island	Better than Base	Somewhat Better	With 3.4 more acres of green space than Alt. 2, Alt. 1 would offer greater urban heat mitigation benefits. Permeable path pavement could be used in either alternative to maximize stormwater infiltration.
Environment, Resilience	Flood Protection	Somewhat Better	Somewhat Better	Both alternatives provide protection from 2070 100-year floods, including sea level rise, via shoreline seawalls that maintain a 16-foot elevation and include an extra two-foot lip.
Environment, Resilience	Environmental Impact	Comparable to Base	Somewhat Worse	Alt. 1 would introduce less encroachment into wetland areas. With a history of adjacent industrial uses, the need to perform more extensive (wider) or intensive (deeper) work along the corridor in order to support Alt. 2's Bypass Road would introduce a greater potential for the release of hazardous materials.
Environment, Resilience	Restore or Improve Access to and Use of Natural Resources	Better than Base	Somewhat Better	Both alternatives would improve natural resources and provide access to waterfront spaces for public use. Alt. 1 would create more green space and reduce vehicle conflicts.
Equity	Truck Impacts on Noise & Air Quality – Residents	Comparable to Base	Somewhat Better	The Alt. 2 Bypass Road would lower truck volumes along Route 1A south of Tomasello Drive, reducing truck-related noise in west Orient Heights and at two nearby sensitive receptors.
Equity	Truck Impacts on Noise & Air Quality – Path Users	Somewhat Better	Somewhat Worse	As a result of greater separation, including from trucks using the Bypass Road, as well as among walking and biking (where possible), the Alt. 1 Shared Use Path would offer a quieter, cleaner user experience.
Equity	Public Health (Benefits for Corridor EJ Communities)	Better than Base	Somewhat Better	Both alternatives would improve neighborhood connections for EJ communities. Alt. 1 would preserve more open space and better enhance access to Chelsea Creek via a lower stress facility.
Feasibility	Estimated Cost	Somewhat Worse	Worse	Capital cost of Alt. 2 would be approximately 50 percent higher ($35.5 M) driven by the high-cost cantilevered segment of the Shared Use Path (Boardman to Addison Street), and the Bypass Road.
Feasibility	Permitting / General Feasibility	Somewhat Worse	Worse	Both alternatives would vastly improve public access, recreation, and open space uses at the waterfront while also requiring authorization to perform work within regulated areas. Given the inclusion of a non-water dependent use (i.e., proposed Bypass Road) in areas that are assumed to remain in the Chelsea Creek DPA, Alt. 2 may encounter greater challenges in permitting under Chapter 91.

** At Bell Circle, Option B (Revere Beach Parkway) would provide Shared Use Path users with direct access to east side amenities while Option A (Harris Street) would afford better access for residents to the west.*

4.2. NEXT STEPS

While MassDOT is not pursing a project at this time, the Route 1A Corridor Study represents an important early step in the project implementation process. If other parties or agencies choose to move forward with any elements of this study, the project development process follows these general stages.

1. Planning and Project Definition
2. Project Development and Design
3. Capital Planning and Project Funding
4. Project Construction

These phases of the project development process are not always clear-cut, are not necessarily sequential, and can overlap. The following is a brief discussion of the project implementation process, with a focus on key elements of the project definition and project development phases that are specific to the Route 1A Corridor Study and implementation of an infrastructure improvement project in the MassDOT – MBTA railroad corridor.

4.2.1. Planning and Project Definition

The Route 1A Corridor Study is a long-term planning study that is intended to help to define a potential project in the railroad corridor along the Chelsea Creek. As such, it is a critical early step that is necessary to turn a concept into a completed transportation project.

The first phase of a transportation project is intended to build upon an identified transportation need, goal, or concept, and begin to translate that general concept into a more clearly defined project. The planning process for a transportation project generally addresses the following major issues:

- Project purpose
- Geographic scope of the project and study area for planning
- Existing and anticipated future conditions in the study area
- Central issues and opportunities that the project needs to address
- Development of potential alternative solutions to the project purpose, issues, and opportunities, with high-level concept design to enable assessment of the alternatives
- Alternatives analysis of the potential solutions to evaluate the benefits, costs, and impacts of the various alternative solutions
- The planning process may entail the selection of a preferred alternative based on the alternatives analysis, or that decision may be finalized in the environmental permitting phase of project development, when there is more information about the alternatives

The Route 1A Study substantially advances the project definition and conceptual planning for this project by defining the project purpose and need; its geographic scope; potential alternative solutions for addressing the purpose and need; and the project's high-level benefits, impacts, and costs.

However, there is still not a clearly defined project for the railroad corridor. There is still work required to engage corridor stakeholders and community residents, build consensus on a project approach, and advance the findings of the Route 1A Corridor Study to define a preferred project.

Key Considerations Moving Forward

The following are **key considerations** that have come out of this study process; these may require additional review in any future steps:

- **Truck Diversions on Local Streets.** Community residents and stakeholders have expressed concerns about existing truck diversions from Route 1A onto local streets such as Bennington Street and Saratoga Street. Additional analysis should include examination of additional data resources to better understand this issue and its potential bearing on a future project definition for the railroad corridor.
- **Induced Traffic Demand.** Another concern that has been raised is the potential for the Alternative 2 Bypass Road to generate additional traffic on Route 1A through the concept of "induced demand." Induced demand is the effect that increased roadway capacity can have on overall traffic volume and demand: by creating additional roadway capacity, an infrastructure project can "induce" new traffic demand by allowing more traffic onto the facility without exceeding the previous level of congestion. This traffic may have diverted from other facilities, other travel modes, or other times of travel; in the longer term, it could result from changes to development patterns.
- **Chapter 91 and Designated Port Area Compliance.** Any infrastructure improvements in the railroad corridor would be subject to Chapter 91 licensing; any segments within the Chelsea Creek DPA (as described in Chapter 1 of this report) would need to comply with DPA restrictions. Industrial businesses have raised concerns about potential conflicts and security concerns between users of a Shared Use Path and water-dependent fuel

off-loading at the fuel piers just north of the Jughandle intersection. Issues have also been raised about potential traffic congestion at the Jughandle intersection resulting from truck connections to the Alternative 2 Bypass Road. Additionally, Chapter 91 regulations call for maintaining public access to public waterways. Many of these issues would need to be resolved through the early project development process and Chapter 91 licensing, as discussed further in the Environmental Permitting section below.

- **Railroad Corridor Ownership and Property Issues.** MassDOT and the MBTA own the inactive railroad corridor from the northern end of the Martin A. Coughlin Bypass Road to its junction with the Newburyport/Rockport Commuter Rail Line. However, there are several challenges to developing the corridor as an infrastructure project. MassDOT and the MBTA own the corridor separately, as a series of individual parcels; implementing a project would require identifying a project proponent and resolving any necessary property transfers or mergers. As noted previously in the report, the width of the corridor varies greatly, and there are many areas of the corridor where abutters have encroached onto MassDOT or MBTA railroad parcels. These issues would require consideration of a range of property issues, including property reclamation from encroachment; design and construction phasing measures to manage width constraints; and potential temporary construction easements.

In addition to considering these issues, any next steps resulting from the Route 1A Corridor Study should be advanced in the context of other planning efforts and development projects near the study corridor. These were described in Chapter 1; the following is a discussion of specific issues and interactions between these initiatives and the Route 1A Corridor Study findings.

- **PLAN: East Boston.** The Boston Planning and Development Agency's (BPDA) PLAN: East Boston process has been underway for the past several years. The BPDA has released draft recommendations related to East Boston's streets and squares, as well as for neighborhood residential areas. Primary issues and findings that are relevant to both studies include the following:
  - **Local transportation connections.** There are key areas of interface between the scope and findings of the two studies, in particular near the southern end of the Route 1A study corridor. The Route 1A Corridor Study has coordinated with PLAN: East Boston on concepts for Day Square, Chelsea Street, Saratoga Street, and Swift Street. The Route 1A Corridor Study alternatives are intended to be generally consistent with the recommendations of PLAN: East Boston. Nevertheless, any project proposals resulting from the Route 1A Corridor Study should entail ongoing coordination related to interface with the local street network, and any recommendations of PLAN: East Boston or other initiatives.
  - **Chelsea Creek waterfront.** An evaluation of "Waterfront and Evolving Industrial Areas" is an important element of PLAN: East Boston. This includes the Chelsea Creek waterfront, which is integrally connected to the Route 1A Corridor Study project definition. PLAN: East Boston's recommendations for the Waterfront and Evolving Industrial Areas are pending; it is expected that these will be informed by the East Boston Municipal Harbor Plan, Chelsea Creek DPA Boundary Review, and Climate Ready Boston.
- **Suffolk Downs Redevelopment.** The Suffolk Downs Redevelopment project and its mitigation program have been discussed throughout this report, and they will have significant interaction with any project that may move forward in the Route 1A corridor. As previously noted, the Route 1A Corridor Study has a planning horizon of 2040, and assumes that the Suffolk Downs Redevelopment and its mitigation program have been implemented as part of its future No-Build baseline condition. In addition, the Route 1A Corridor Study retains most of the Suffolk Downs mitigation projects in the form that they are proposed in the Suffolk Downs permitting and environmental review documents. However, there are some areas of overlap between the Route 1A Corridor Study alternatives and the proposed Suffolk Downs Redevelopment mitigation proposals, which MassDOT's Highway Division and the Suffolk Downs Redevelopment project proponent should continue to coordinate on:
  - **Curtis Street Safety Improvements.** The Suffolk Downs Redevelopment mitigation program includes a high-level concept for safety improvements that would separate the two Route 1A southbound through-lanes from the exiting traffic to Curtis Street and the Saratoga Street exit ramp. The Route 1A Corridor Study includes two alternatives for this location that would make similar vehicular safety improvements, as well as additional pedestrian and bicycle access and safety improvements. The Suffolk Downs Redevelopment mitigation project should consider the Route 1A Corridor Study alternatives in its design process.

- **Route 1A/Tomasello Drive and Route 1A/Jughandle Intersections.** The Suffolk Downs Redevelopment mitigation program would replace the existing Tomasello Way and its unsignalized intersection at Route 1A with a new roadway, Tomasello Drive, that connects to Route 1A at a fully-signalized intersection. This intersection would be only about 200 feet from the existing Route 1A/Jughandle intersection, which provides a signalized connection from Route 1A southbound to the fuel tanks on the eastern side of Route 1A. This is very close spacing for signalized intersections, especially on a higher-speed facility like Route 1A. There is also an existing "Public Waterfront Access" pedestrian connection from Route 1A to the Chelsea Creek in this area, and this would also be a major public access point for a potential future Shared Use Path along the Chelsea Creek. Therefore, this area will require careful design to ensure that the traffic operations at the two closely-spaced intersections are properly coordinated, and that there is a safe and appealing pedestrian – bicycle connection from the Orient Heights neighborhood and Suffolk Downs Redevelopment to the Chelsea Creek waterfront.
- **Revere Beach Parkway/Winthrop Avenue/Harris Street Intersection.** The Route 1A Corridor Study alternatives include options for a major Shared Use Path connection through this intersection. The Suffolk Downs Redevelopment mitigation program entails redesign and reconstruction of this intersection, and this project is currently in the design phase. It would be desirable if the design for this location did not preclude future provision of a Shared Use Path connection through the intersection.

- **Cargo Ventures.** As discussed in Chapter 1, the Route 1A Corridor Study was initiated in response to the proposal by Cargo Ventures (a major industrial property owner in the study corridor) to purchase easements on the MassDOT/MBTA-owned railroad corridor to build a Bypass Road with Shared Use Path. The Route 1A Corridor Study evaluated the benefits, impacts, and costs of a similar proposal (Alternative 2) relative to a Shared Use Path Only configuration (Alternative 1) and to the No-Build condition. Future activity related to developing a project based on the Route 1A Corridor Study should be undertaken with an understanding of Cargo Ventures' latest investment plans, and the interaction of the study alternatives with the potential redevelopment of the Cargo Ventures properties. Topics should also include the interactions among a potential Bypass Road, Shared Use Path, and properties at the southern end of the study corridor, including the former Massachusetts Water Resources Authority pumping station at 605 Chelsea Street, CubeSmart Self Storage, and the freight operations in that area that currently use the MassDOT/MBTA-owned parcels.

4.2.2. Project Development and Design

Once a project has been clearly defined through planning, and a consensus on the project approach has been achieved through civic and stakeholder engagement, the project proponent can move forward into the project development and design phase.

This begins with the preliminary design and environmental review/permitting phase of project development. This phase of the project entails:

- Advancing the project design to a level that enables full assessment of its impacts
- Clearly outlining all environmental and social impacts that are expected to result from a proposed project
- Undertaking a public review of those impacts relative to the anticipated project benefits
- Developing strategies for minimizing and/or mitigating those impacts
- Obtaining the necessary approvals to move forward with the project from the responsible federal, state, and local regulatory agencies

Given the waterfront location of the project corridor, the significant permitting regime associated with the Chapter 91 Massachusetts Public Waterfront Act, and potential environmental sensitivity, the environmental review and permitting for the project will be especially critical. The following are some of the key elements and phases of the environmental review and permitting phase.

Federal Environmental Review

The central element of the federal environmental review process is the National Environmental Policy Act (NEPA). NEPA review and approval is required for any policy, program, or project that entails a federal action. For transportation projects, such federal actions generally entail the use of federal funding or the granting of a federal permit. The NEPA environmental review is conducted by a "lead federal agency" that is determined to have the most relevant jurisdiction of the policy, program, or project. For a Shared Use Path and/or Bypass Road project that would be expected to arise from the Route 1A Corridor Study, it is anticipated that the Federal

Highway Administration (FHWA) would most likely be the lead federal agency. There are three levels of NEPA review:

- Categorical Exclusion (CATEX). A federal action may be categorically excluded from a more detailed NEPA review if that type of action has been determined to have no significant effect on the human environment. Each federal agency has NEPA procedures that define actions that categorically excluded.
- Environmental Assessment (EA). If a federal action does not meet the standards for a CATEX, then the action may have the potential to cause significant environmental effects. This requires a review of the potential impacts of the federal action on a very broad range of environmental and social factors, including air quality, noise and vibration, water resources (water quality, wetlands, flooding hazards, floodplains, and ecological systems), wildlife and endangered species, waste and hazardous materials, recreational and open space resources, land uses, cultural and historical resources, aesthetics and visual impacts, socio-economic and Environmental Justice, public health and safety, transportation systems, and energy resources. If the lead federal agency determines that the federal action will not have significant social and environmental impacts, then it will issue a Finding of No Significant Impact (FONSI). If the EA indicates that the environmental impacts of a proposed federal action would be significant, an Environmental Impact Study would be required.
- Environmental Impact Statement (EIS). An EIS is required if it is determined that a proposed federal action has the potential to significantly affect the human and/or natural environment. The EIS for a transportation project would generally cover similar issues to what is covered in an EA, but the regulatory requirements for an EIS are more detailed and rigorous. In addition, there are generally higher standards for mitigation and monitoring of impacts. The EIS process concludes with the lead federal agency issuing a Record of Decision (ROD), which states the agency's decision, describes the alternatives evaluated, and states the requirements for mitigation and monitoring.
- Other federal permits. A range of other federal agency review and would likely be required for a project resulting from the Route 1A Corridor Study, including but not limited to the following:
  - Section 106 historical approval (Massachusetts Historical Commission)
  - Section 404 Clean Water Act permit (U.S. Army Corps of Engineers)
  - National Pollutant Discharge Elimination System (NPDES) permit (U.S. Environmental Protection Agency)

State and Local Environmental Review

A project in the Route 1A corridor would also require state and local environmental review. The environmental review regime for the Commonwealth of Massachusetts is governed primarily by the Executive Office of Energy and Environmental Affairs (EEA), and it comprises several review and permitting processes led by EEA component agencies.

- Massachusetts Environmental Policy Act (MEPA). MEPA is administered by the Massachusetts Executive Office of Energy and Environmental Affairs (EEA). The requirements for MEPA are governed by the MEPA statute (Massachusetts General Laws, Chapter 30, Sections 61 – 62I), which establishes "impact thresholds" for the level of environmental review required for a given project. The MEPA process entails the following principal filings, depending upon the degree of impact.
  - Environmental Notification Form (ENF). An ENF provides general information about a project, along with an assessment of the project relative to established MEPA thresholds for impacts to land, wildlife, wetlands, waterways, tidelands, water quality, wastewater, transportation systems, energy, air quality, solid waste, hazardous waste, historical and archaeological resources, and Areas of Critical Environmental Concern (ACECs). The ENF is subject to public and public agency review and consultation. For a project in the study corridor, an ENF may be required due to requirements for dredging in the Chelsea Creek, disposal of dredged material, creation of a new non-water-dependent use, or construction/reconstruction of a pile-supported structure in flowed tidelands or other waterways.
  - Environmental Impact Report (EIR). If it is determined that the project exceeds any of the MEPA thresholds, a mandatory EIR is required. Irrespective of which thresholds are exceeded, the EIR must evaluate the full range of social and environmental impacts governed by MEPA. Depending on the scale of the project and the level of impact, a Single EIR (SEIR) may be required, or a Draft EIR (DEIR) and Final EIR (DEIR). Based on the public and agency review and comments provided on the project, the Secretary of EEA will issue a Determination on the EIR as to whether

or not the EIR is adequate, and what mitigation measures are required. If the EIR is determined to be inadequate, a supplemental EIR may be required to address those inadequacies.

These MEPA review filings and impact assessments share many similarities with NEPA review, and projects frequently file "joint documents" that cover review requirements for both NEPA and MEPA.

As previously discussed, a project in the railroad corridor would require a Chapter 91 Waterways License from the Massachusetts Department of Environmental Protection (MassDEP). The Chapter 91 Waterways Program is intended to protect and promote public use of the Commonwealth's tidelands and waterways, which are protected as a public trust. The program is designed to preserve public access to Commonwealth tidelands, use of public facilities along the waterfront, and public enjoyment along the water's edge, while protecting tidelands and waterways for water-dependent uses, such as commercial fishing, shipping, marinas, and other water-related activities.

As previously discussed, portions of the railroad corridor and potential project area remain within the Chelsea Creek Designated Port Area (DPA). DPA restrictions are intended to preserve maritime infrastructure, often built at significant public cost, for continued water-dependent use and to prevent the conversion of these areas to non-water-dependent uses that do make use of the maritime infrastructure investments. Some water-dependent uses in DPAs may be inconsistent with full public access, so public access may be restricted in such cases.

Whether permits can be obtained for either Alternative 1 or Alternative 2 depends upon:

- The defined purpose and need for the proposed project,
- The location and nature of the water-dependent uses in the DPA,
- Whether there are conflicts between the proposed project and the water-dependent uses, and
- Whether there are practical alternatives to avoid or mitigate any conflicts.

Other State and Local Permits. Other state and local environmental permits would likely be required for a project resulting from the Route 1A Corridor Study, including but not limited to the following:

- Stormwater Management Standards Compliance Review (MassDEP)
- Massachusetts Contingency Plan Review/Preliminary Determination (MassDEP)
- Notification Prior to Construction or Demolition (MassDEP)
- Section 401 Water Quality Certificate (MassDEP)
- Order of Conditions under the MA Wetlands Protection Act and local wetlands bylaws (Conservation Commission for all municipalities affected by the project)
- Building permits (Massachusetts Department of Public Safety, municipal governments)

4.2.3. Capital Planning and Project Funding

Funding for the project would need to be secured, preferably in parallel with permitting activities. Not only do federal, local, and state planning processes need to be followed for permitting approvals, but additional processes are required to be navigated for the project to receive public funding. It is likely that both state and federal funding sources would be required in order to implement a project of this scale. A number of different funding and grant sources at each level could offer potential funding. Typically, federal sources fund 80 percent of transportation infrastructure capital costs, while the remaining 20 percent is funded by state or local contributions.

Federal Funding Programs

A number of programs and grants could comprise the 80 percent federal contribution for the project. The recently passed Infrastructure Investment and Jobs Act (IIJA) offers new possibilities as well as bolsters existing programs administers by the Federal Highway Administration (FHWA). Interestingly, locally administered processes are the key to receipt of federal funding. If the project is to be funded through FHWA formula funds or Congestion Mitigation and Air Quality (CMAQ) funds, coordination with the Boston Region Metropolitan Planning Organization (MPO) would be required for the obligation of funds. The project, and its attendant federal funding, would need to be programmed into the MPO's Transportation Improvement Program (TIP) and Long-Range Transportation Plan (LRTP) following adoption by the MPO.

Existing Federal Programs

- The FHWA has significantly increased its apportionments to states under the IIJA. Massachusetts is expected to receive $5.3 billion over five years in **FHWA formula funding**, representing an increase of 48.4 percent from the state's previous allocation under the Fixing America's Surface Transportation (FAST) Act. A component program of this formula funding is the Surface Transportation Block Grant Program (**STBG**), formerly known as STP, which provides flexible funding that may be used by local entities for projects to preserve and improve conditions on and the performance of any federal-aid highway, bridge, or tunnel, as well as for projects on any public road (except local roads and rural minor collectors), pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals. Fifty percent of a state's STBG funds are to be distributed to areas based on population (sub-allocated), with the remainder to be used in any area of the state. The project is a promising candidate given its presence in the state's most populous city and urban area.
- **CMAQ Program Funds** are available to projects that have the potential of improving air quality or reducing carbon emissions. Additional analysis would need to be performed to demonstrate the project's eligibility.

New Federal Programs in the Infrastructure Investment and Jobs Act (IIJA)

- **Carbon Reduction Program (CRP).** This new federal program has $6.42 billion available over the next five years or an average annual apportionment of $1.28 billion. Eligible projects under this new program must contain a transportation alternative (as defined under the Moving Ahead for Progress under the 21st Century Act (MAP-21)), including, but not limited to, the construction, planning, and design of on-road and off-road trail facilities for pedestrians, bicyclists, and other nonmotorized forms of transportation; and efforts to reduce the environmental and community impacts of freight movement, among others. The project would be potentially eligible in several realms under this program.
- **Safe Streets and Roads for All (SS4A).** SS4A is a discretionary program with $5 billion in appropriated funds available over the next 5 years in grant form for initiatives to prevent roadway deaths and serious injuries. In fiscal year 2022 (FY22), up to $1 billion was made available. Eligible activities include the development of an SS4A Action Plan and the implementation of actions identified in such a plan, including the transformation of a roadway corridor on a High-Injury Network into a Complete Street with safety improvements to control speed, separate users, and improve visibility, along with other measures that improve safety for all users; the installation of pedestrian safety enhancements and closing network gaps with sidewalks, supporting the development of bikeway networks, and others. The project's numerous safety improvements, as well as the creation of the Shared Use Path, would make the project eligible.
- **Reconnecting Communities Pilot (RCP).** RCP is a discretionary federal grant program, funded with $1 billion to be allocated over the next 5 years, is dedicated to reconnecting communities that were previously cut off from economic opportunities by transportation infrastructure. Funding supports planning grants and capital construction grants, as well as technical assistance, to restore community connectivity through the removal, retrofit, mitigation, or replacement of eligible transportation infrastructure facilities. The program annually makes $150 million available for capital projects and an additional $50 million available for planning grants.
- **Promoting Resilient Operations for Transformative, Efficient, and Cost-Saving Transportation (PROTECT).** The PROTECT Program, intended to help make surface transportation more resilient, includes formula funds distributed to states and competitive grants. This project may be eligible for PROTECT funding to cover costs related to resilience improvements and at risk-coast activities since qualifying actions include planning, resilience improvements, community resilience and evacuation route activities, and at-risk coastal infrastructure activities.

State Funding and Capital Planning Processes

As with federal funding, there are many potential state funding sources and programs that provide funding for improvements in the study corridor. The MassDOT Capital Investment Plan (CIP), a five-year rolling capital plan that the Commonwealth's transportation investment priorities, establishes the policies and priorities that guide state transportation funding. The CIP organizes its funding strategy into three main categories: Reliability, Modernization, and Expansion.

For the types of improvements envisioned in the Route 1A Corridor Study, there are three different MassDOT Highway Division funding categories in the CIP that would be most likely to provide support:

- Modernization – Roadway Reconstruction
- Modernization – Carbon Reduction
- Expansion – Bicycle and Pedestrian

In order for a project to receive state monies, it would have to be identified in the MassDOT Highway CIP and adopted. Figure 4–1 explains the CIP adoption process and illustrates how enmeshed the identification of sources of funding is within the process.

Presently, MassDOT's 2023-2027 CIP includes $22.8 million for the expansion of bicycle and pedestrian infrastructure; this includes $4.56 million in state funds. Since capital improvements to Route 1A in Boston are already identified in the 2023-2027 CIP under the Reliability program, this project would be potentially eligible to receive further additional future funding in the Modernization – Roadway Reconstruction category.

December	January	February	March	April	May	June
Review Programs / Sizes	**Refine CIP Programs / Sizes / Scoring**	**Project Prioritization**	**Align CIP / STIP / funding**	**Choose projects/ draft CIP**	**CIP Public Comment Period**	**MassDOT Board Review / Final CIP Approved**
Review and update existing CIP programs / identify new programs Preliminary financial guidance (federal & state) developed	CIP programs/ sizes finalized; score new projects. Develop estimates of capital sources & federal formula targets distributed	Project readiness evaluated; capital sources refined; projects prioritized and draft project selection underway	Fiscal constraint analysis and CIP programs / sizes finalized; project lists developed MPOs release development scenarios / preferred projects selected	Final QA/QC on sources & uses and fiscal constraint analysis conducted MPOs release draft TIPs for 21-day public comment; draft CIP document finalized	Draft CIP finalized and submitted to MassDOT Board for consideration; public comment period commences Draft STIP released for public comment. ANF publishes Commonwealth's capital plan	Equity Analysis of CIP investments completed; final CIP reviewed and approved by MassDOT Board STIP is endorsed after public comment period and submitted to federal and state partners

Figure 4–1. Overview of Massachusetts Capital Improvement Plan Process