

Executive Summary

Comments on this Environmental Assessment (EA) and Section 4(f) Evaluation may be submitted in writing to:

Katherine S. Fichter
MassDOT Office of Transportation Planning
10 Park Plaza, Room 4150
Boston, MA 02116

Comments must be received by **November 18, 2011**. Comment letters may also be submitted by fax to Katherine Fichter at (617) 973-8035, TTY (617) 973-7306, or by email to katherine.fichter@state.ma.us.

A public hearing will be held to discuss the EA and provide opportunity for members of the public and other stakeholders to provide comments. The meeting will be held on:

October 20, 2011 at 6:30 PM
Somerville High School – Auditorium
81 Highland Avenue, Somerville, MA 02143

If you need this document in alternative languages or formats, please contact Regan Checchio at (617) 357-5772, or by email to rcheccchio@reginavilla.com.

About the Project

The Green Line Extension project is an initiative of the Massachusetts Department of Transportation (MassDOT) and the Massachusetts Bay Transportation Authority (MBTA) to improve corridor mobility, boost transit ridership, improve air quality, ensure equitable distribution of transit services, and support opportunities for smart growth initiatives and sustainable development in the project study area of Cambridge, Somerville, and Medford. The project is required by the State Implementation Plan (SIP) and fulfills a longstanding commitment of the Central Artery/Tunnel project to increase public transit. The Green Line Extension is expected to open for service in June 2019 and would cost \$971 million, plus finance charges, in 2011 dollars to construct. “Year-of-Expenditure” (YOE) capital costs for the Proposed Action would be approximately \$1.1 billion, plus finance charges, in YOE dollars. The Green Line Extension project requires review under the National Environmental Policy Act (NEPA) in order to use Federal funding. The Federal Transit Administration (FTA) has agreed to serve as the lead federal agency for the project for the NEPA review.

The Green Line Extension project would provide light rail transit beyond Cambridge's Lechmere Station, which is currently the only Green Line station north of the Charles River. The Proposed Action would serve the region's most densely populated communities that today are surrounded by, but are not directly served by, fixed-guideway transit. The residential densities are approximately 18,870 people per square mile in Somerville, 15,760 in Cambridge, and 6,850 in Medford.¹ Somerville is recognized as one of the most densely populated municipalities in the United States. In addition, approximately 60 percent of the residents of Cambridge, Somerville, and Medford live in state-defined environmental justice areas, which take up approximately 42.8 percent of the cities' combined area.²

Although MBTA commuter rail lines pass through the project study area, there are no rail transit stops within these communities. The project study area is currently served by bus transit only, and U.S. Census data (2000) indicates that approximately 26 percent of project study area households do not own a vehicle, which suggests a market for a higher level of transit service than exists today. Existing transit service within the project study area is currently offered by 15 MBTA bus routes with access to points within the project study area as well as to Boston, Arlington, Woburn, and Winchester. However, existing bus routes operate within the congested urban street network where intense automobile traffic hinders bus service and causes inefficient and unreliable transit service in the project study area.

The Green Line Extension project is needed to improve corridor mobility and livability, particularly in transit-dependent and environmental justice populations. The Green Line Extension project enjoys community support throughout the corridor, where residents and businesses want better and expanded transportation access.

The Green Line Extension project offers benefits to the area, in that the Proposed Action would:

- ▶ Focus regional transportation investment in established environmental justice populations, connecting currently underserved residents to jobs and services in Boston and Cambridge and strengthening business and residential districts in the corridor.
- ▶ Improve transit travel times within the project study area by 13 to 17 minutes (compared to the No-Build Alternative) from the relocated Lechmere Station to Union Square or College Avenue, respectively.
- ▶ Offer a one-seat ride from the project study area into downtown Boston, eliminating the need for commuters to make the bus/rail transfer to the Green Line at the relocated Lechmere Station or to the MBTA Orange and Red Lines at other stations.

¹ United States Census Bureau, *Census 2000*. Available at <http://www.census.gov>.

² Environmental justice areas are defined by thresholds for income, minority populations, foreign-born populations, and English language proficiency. Therefore, most environmental justice areas contain a mix of environmental justice and non-environmental justice residents.

- Generate daily ridership at the project's seven stations of approximately 49,000 boardings and alightings by 2030, with approximately 92 percent of the new ridership is projected to take place in the project's opening year. The Green Line as a whole would also see an increase of 25,970 boardings, and the entire MBTA system would see an increase of 7,500 new daily linked transit trips as a result of the extended Green Line service.
- Substantially improve mobility and service quality for transit-dependent riders, with improved access (*i.e.*, service, travel time savings) to jobs or schools and health care facilities and provide universal access, meeting Americans with Disabilities Act (ADA) standards at all stations.
- Be fully grade separated and principally constructed within existing MBTA rail rights-of-way, which would enable light rail to serve pedestrian-oriented centers with minimal disruption to the surrounding community and with minimal property or neighborhood impacts.
- Maintain existing railroad operations while employing mitigation measures to reduce noise and vibration impacts, resulting in residential and retail areas that would experience reduced existing noise levels.
- Reduce daily vehicle miles traveled (VMT) by 25,728, as compared to the No-Build Alternative, improving regional air quality and providing zero-emission transportation capacity for anticipated growth.

The Proposed Action

The Proposed Action, as shown on Figure ES-1 and evaluated in this Environmental Assessment (EA), includes:

- Extending Green Line service 3.4 miles north to Medford (the Medford Branch) within the existing MBTA Lowell Line commuter rail right-of-way, from a relocated Lechmere Station to College Avenue Station with intermediate stations at Washington Street, Lowell Street, Gilman Square, and Ball Square; and
- Extending Green Line service 0.9 miles west to Union Square (the Union Square Branch) in Somerville, within the existing MBTA Fitchburg Line commuter rail right-of-way, from the relocated Lechmere Station to a new station near Union Square.

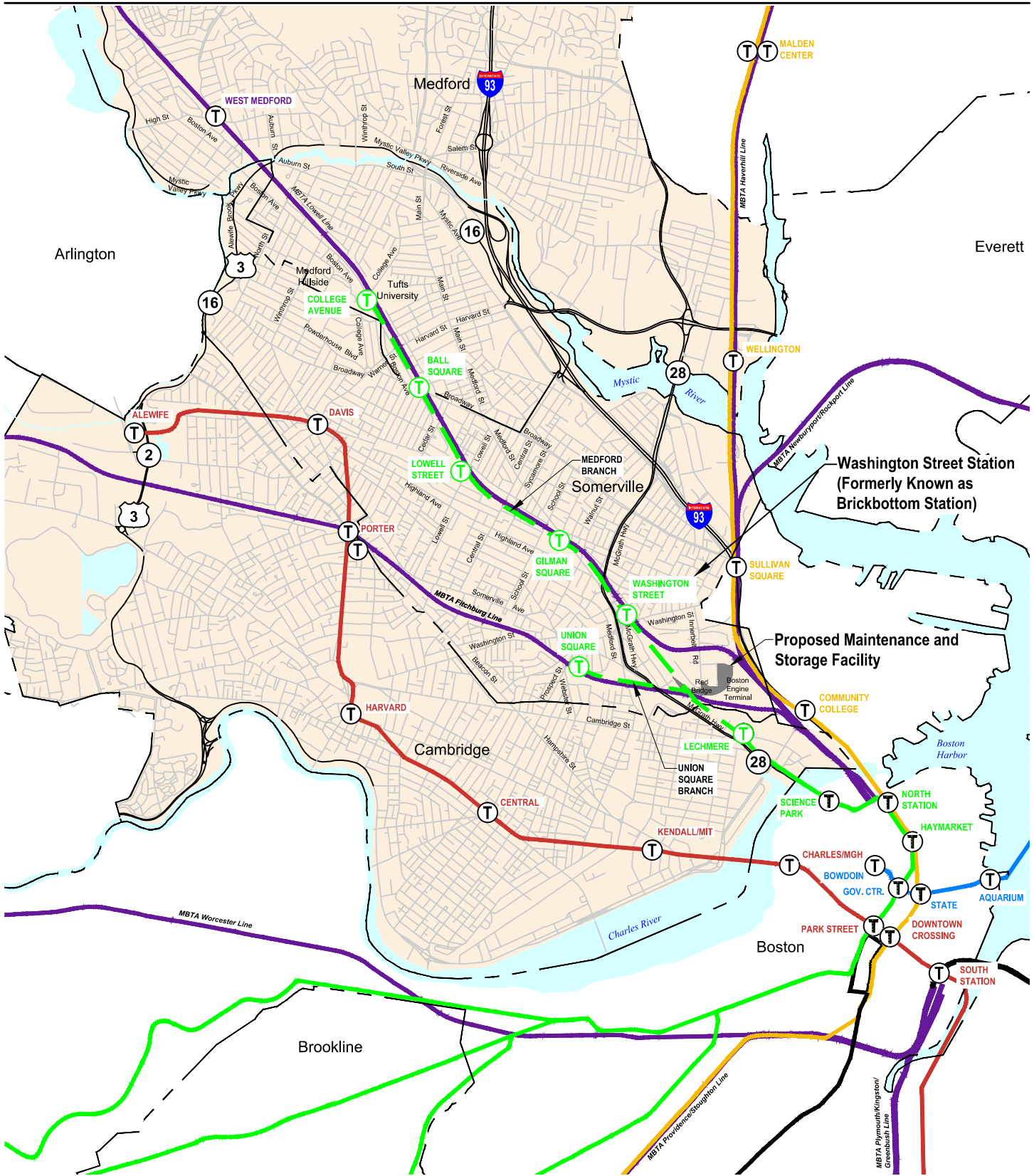
A detailed analysis of potential alternative alignments, station sites, and environmental impacts was performed and documented in a Draft Environmental Impact Report/ Environmental Assessment (DEIR/EA) in October 2009. As a result of this analysis, the Proposed Action was selected for its ability to: meet all of the project goals; provide the best balance of cost, ridership, and environmental impacts; be operationally practical; and generate a high number of new systemwide transit trips.

Since the issuance of the DEIR/EA, a number of items have been updated as the conceptual engineering has advanced and additional analysis has been performed. Items that have been revised include:

- **Noise and Vibration** –Additional noise and vibration analyses were conducted and specific mitigation measures identified. The additional noise and vibration analysis was prepared in accordance with FTA guidelines and is presented in Sections 6.7, *Noise*, and 6.8, *Vibration*, and in Appendix F, *Noise and Vibration Technical Report*, of this EA. Additionally, tracks in the vicinity of the Brickbottom Artists building have been relocated farther from the northeast building façade in order to minimize noise impacts in this vicinity.
- **Stations** – Working with the public, local municipalities, and project stakeholders, the proposed station locations and designs were further refined. As described in Section 4.4.4, *Stations*, of this EA, the refinements to station designs include:
 - Modifications at the relocated Lechmere Station including refinements to the station layout, busway and roadway improvements, and pedestrian access improvements;
 - Relocation of Washington Street Station (formerly Brickbottom Station) to a location closer to Washington Street for better neighborhood access and to minimize property acquisitions; and
 - Refining the conceptual designs at the stations to provide pickup/drop-off locations, as well as emergency egress.
- **Maintenance Facility** – Additional alternatives were further evaluated for the proposed maintenance and storage facility required to support the Green Line Extension project. To address and resolve public concerns that were raised following the selection of the Yard 8 site, MassDOT quantitatively analyzed two additional potential sites for the facility – Option L and Mirror H. The Option L site was selected as the preferred location for the maintenance and storage facility in late 2009, was further studied in early 2010, and is described in Section 4.4.5, *Maintenance and Storage Facility*, of this EA.
- **Ridership** – The statewide transportation model, maintained by the Boston Region Metropolitan Planning Organization’s Central Transportation Planning Staff (CTPS), was updated with 2009 systemwide passenger survey results and a revised list of programmed future regional projects.

Plotted: 5/5/2011 4:23 PM

\\mabosdata\projects\10303.00\graphics\FIGURES\EA_Graphics\10303000_EA_Proposed_Action.dwg



Green Line Extension Project

Figure ES-1
Proposed Action

- Legend**
- MBTA Green Line
 - MBTA Orange Line
 - MBTA Red Line
 - MBTA Blue Line
 - MBTA Silver Line
 - MBTA Commuter Rail Line
 - Green Line Proposed Action
 - T Proposed Station
 - Proposed Maintenance Facility



- **Historic/Archeological Resources** – Correspondence with the Massachusetts Historical Commission (MHC) began in 2008. Section 106 of the National Historic Preservation Act³ (NHPA) and Section 4(f) of the U.S. Department of Transportation Act of 1966⁴ consultation sessions were held in December 2010 with the MHC and the local historical commissions to discuss any Section 106 properties and Section 4(f) properties that would be affected by the project. Based on the meetings, additional historic resources were identified and analyzed. A consultation session was offered to interested Tribal Nations to discuss potential archeologically sensitive resources. Additional information on the Section 106 process is provided in Section 2.6.3, *Section 106 Consultation Sessions*; Section 5.15, *Cultural Resources*; and Section 6.13, *Cultural Resources*, of this EA. Additional information on the Section 4(f) process is provided in Section 6.11, *Parks and Recreation Areas*, and Chapter 8, *Section 4(f) Evaluation*, of this EA.

The engineering and environmental analyses have been revised, where appropriate, to reflect the changes described above. The environmental impacts of the Proposed Action have been fully evaluated and are described in detail in this EA.

About the NEPA Process

The Green Line Extension project requires review under the NEPA in order to use Federal funding. The Council on Environmental Quality (CEQ) Regulations for Implementing NEPA ensure that information on the social and environmental impacts of any Federally funded action is available to public officials and citizens before decisions are made and before actions are taken.⁵

NEPA regulations direct Federal agencies to integrate into their planning and decision-making the natural and social sciences, environmental amenities and values, and the design arts along with the necessary engineering and economic considerations.⁶ The objective is to balance infrastructure development, economic prosperity, health and environmental protection, community and neighborhood preservation, and quality of life. Based on the current assessment of project impacts, a Finding of No Significant Impact (FONSI) is anticipated for the Green Line Extension project. However, a Public Hearing will be held and comments on this EA will be addressed and considered prior to a final decision.

In addition to environmental review under NEPA, the project also required preparation and review of an October 2009 DEIR and a June 2010 Final Environmental Impact Report (FEIR) under the Massachusetts Environmental Policy Act (MEPA). Following

³ Section 106 of The National Historic Preservation Act of 1966, as amended through 2006.

⁴ Section 4(f) of the United States Department of Transportation Act of 1966 (Amended March 12, 2008 in 73 FR 13395; implemented at 23 U.S.C. 138 and recodified at 49 United States Code, Subtitle I, Section 303(c). Available at: <http://www.gpo.gov/fdsys/pkg/FR-2008-03-12/pdf/E8-4596.pdf>

⁵ Executive Office of the President, Council on Environmental Quality, *Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act* (40 CFR Parts 1500 - 1508).

⁶ United States Department of Transportation, Federal Transit Administration and Federal Highway Administration, *Environmental Impact and Related Procedures* (23 CFR Part 771). Available at: <http://www.fta.dot.gov/>

public review of the FEIR, the Secretary of the Executive Office of Energy and Environmental Affairs (EEA) issued a final Certificate on July 30, 2010 stating that the Green Line Extension project adequately and properly complies with MEPA and its implementing regulations, and can proceed with state and local permitting.⁷

Public Involvement

The Green Line Extension project has received considerable public input throughout the planning process. Hundreds of comment letters on project documents and community participation in public hearings and workshops reflect a substantial interest in the future of the corridor from elected officials and municipal representatives; city, state, and regional agencies; environmental, bicycle, and pedestrian advocacy groups; neighborhood groups; groups that represent the disabled; businesses; residents; and the general public.

To plan and develop the Green Line Extension project in coordination with this wide range of interests, MassDOT established a public involvement process that included an Advisory Group, open public meetings, station workshops, and coordination with the staff and elected officials of Cambridge, Somerville, and Medford, as well as other stakeholders and neighborhood interest groups within the project study area. The project team has also provided documents summarizing project meetings, activities, and information on a regular basis. The team reached out to environmental justice and disabled populations within the community to ensure their participation in the NEPA process. In addition to numerous public meetings, a public hearing was held after publication of the DEIR/EA, and a public meeting was held after the FEIR was released. A Design Working Group has been established to participate in advancing the conceptual engineering elements. Most recently, a Public Involvement Plan (PIP) has been developed for use during the design and construction phases of the project.

MassDOT has maintained an interactive project website, www.mass.gov/greenlineextension. Along with a brief overview of the project's history and current phase, the website provides access to various reference materials, including documents from previous phases of the project as well as the most up-to-date project materials. Interested individuals are able to sign up to be part of the project mailing list. Individuals are also able to post comments about the project publicly, as well as use the website to ask questions of MassDOT and the project team.

Regular coordination with the officials of Cambridge, Somerville, and Medford has occurred throughout the project. In addition to the outreach at a local level, there was also a large amount of coordination with the various state and Federal agencies to discuss potential project impacts and other project details. Agency coordination

⁷ Commonwealth of Massachusetts, Executive Office of Energy and Environmental Affairs. *Green Line Extension - Certificate of the Secretary of Energy and Environmental Affairs on the Final Environmental Impact Report*, July 30, 2010. Available at: www.mass.gov/greenlineextension

included, but was not limited to, the FTA, the MBTA, MassDOT, Massachusetts Department of Environmental Protection (MassDEP), the Massachusetts Department of Conservation and Recreation (DCR), the Metropolitan Area Planning Council (MAPC), the MHC, and CTPS. Additional information on public involvement is included in Chapter 2, *Public Involvement and Agency Coordination*, of this EA.

What Alternatives did MassDOT/FTA Evaluate?

Six “Build” Alternatives, a No-Build Alternative, and a Baseline Alternative were evaluated in the DEIR/EA, published in October 2009. The Baseline Alternative was evaluated to identify the best option for meeting the transportation needs of the project study area with smaller capital investments than were estimated for the Build Alternatives. The Baseline Alternative evaluated in this EA includes enhanced bus service within the project study area, including expanding the existing MBTA Route 80 service between Lechmere Station and the proposed Build Alternatives’ College Avenue Station site, and providing a new shuttle bus service between Lechmere Station and Union Square. The six Build Alternatives that were evaluated in the DEIR/EA, summarized in Table ES-1, were based on two alternative termini for the Medford Branch and two alternative alignment locations for the Union Square Branch.

Table ES-1 Comparison of DEIR/EA Build Alternatives

Alternative	Medford Branch Terminus Alternatives	Union Square Branch Alignment Locations	Daily Boardings (2030) ¹	Capital Cost (\$M) ²
1	College Ave	Commuter Rail Right-of-Way	7,500	\$804.8
2	Mystic Valley Parkway/ Route 16	Commuter Rail Right-of-Way	8,900 ³	\$959.3
3	College Ave	In-street	7,700	\$829.8
4	Mystic Valley Parkway/ Route 16	In-street	8,700	\$984.3
5	Mystic Valley Parkway/ Route 16	N/A	10,500	\$870.0
6	N/A	Commuter Rail Right-of-Way	3,900	\$370.6

¹ Additional systemwide daily boardings, as compared to the No-Build Alternative.

² 2008 dollars.

³ These results included 300 parking spaces at Mystic Valley Parkway/Route 16 Station. With no parking at this station, the ridership would be 8,600 new systemwide boardings daily, and the capital cost would be \$951.8 million.

This EA provides further evaluation of the DEIR/EA’s Locally Preferred Alternative (LPA), Alternative 1, and additional information on alternatives evaluated is included in Chapter 4, *Alternatives*, of this EA.

Project Description

The Proposed Action would provide service to College Avenue in Medford and Union Square in Somerville using a two-branch operation, both primarily within existing commuter rail rights-of-way. The primary infrastructure improvements include relocating existing commuter rail lines; constructing approximately 4.3 miles of new light rail track and ancillary systems, four multi-span viaducts, seven new stations, a vehicle maintenance and storage facility; and reconstructing 11 bridge structures to support the extended service. An additional 24 Green Line cars would be needed to accommodate the proposed headways (time between each train) and projected ridership for the project. Based on current MBTA subway fares, fares for the Green Line Medford Branch and Union Square Branch would be \$1.70 for one-way adult trips using a Charlie Card. Further description of the operating plan for each branch is included in the following sections.

Medford Branch

The 3.4-mile long Medford Branch would operate from a relocated Lechmere Station to College Avenue in Medford within the MBTA Lowell Line commuter rail right-of-way. This branch would begin at relocated Lechmere Station and head northwest, meeting the MBTA Lowell Line just south of Washington Street in Somerville. From Washington Street, the alignment would run parallel to the MBTA Lowell Line to Medford, terminating at College Avenue in Medford.

Estimated travel time between College Avenue Station and the relocated Lechmere Station for the proposed Green Line Medford Branch is 9.5 minutes. Green Line service for the Medford Branch would operate on headways equal to that of the existing Green Line D branch service: 5 minutes in the morning and evening peak periods and 10 minutes during off-peak periods.

The Medford Branch would be constructed within the existing MBTA Lowell Line right-of-way, owned by the MBTA. The existing commuter rail tracks would be shifted approximately 13 feet toward the east side of the right-of-way. The new light rail track and overhead contact system (OCS) (electric power supply) would be added within the western half of the right-of-way. Most of the right-of-way is located below the surrounding land surface, reducing environmental impacts such as increases in noise levels and changes to the visual environment. Retaining walls would be used where necessary to eliminate the need to acquire adjacent property.

Although the Medford Branch would be constructed within the existing MBTA right-of-way, 10 existing roadway and rail bridges would need to be reconstructed to accommodate the new light rail tracks. These include:

- Somerville:
 - Former Red Bridge (rail)
 - Washington Street (rail)
 - Walnut Street (roadway)
 - Medford Street (roadway)
 - School Street (roadway)
 - Lowell Street (roadway)
 - Cedar Street (roadway)
 - Broadway (roadway)
- Medford:
 - Harvard Street (rail)
 - College Avenue (roadway)
- The Lechmere Viaduct over Monsignor O'Brien Highway/Route 28 in Cambridge would be replaced by a new light rail viaduct paralleling the highway on its north side and incorporating the relocated Lechmere Station.

Union Square Branch

The 0.9-mile long Union Square Branch would also originate at the relocated Lechmere Station and head northwest to Red Bridge, then follow the MBTA Fitchburg Line commuter rail right-of-way to the Union Square area. The Union Square Branch would be constructed within the existing MBTA Fitchburg Line right-of-way. The existing commuter rail tracks would be shifted approximately 10 to 14 feet toward the south side of the right-of-way. The new light rail track and OCS would be added within the northern half of the right-of-way. Most of the right-of-way is located below the surrounding land surface, reducing environmental impacts such as increases in noise levels and changes to the visual environment. Retaining walls would be used where necessary to eliminate the need to acquire adjacent property. The Union Square Branch would require reconstructing the Medford Street rail bridge in Somerville. Two new viaducts would be needed at Red Bridge Junction to serve the Union Square Branch.

Estimated travel time between Union Square and relocated Lechmere Station for the proposed Green Line Union Square Branch is 4.5 minutes. Green Line service for the Union Square Branch would operate on headways equal to that of the existing Green Line E branch service: 6 minutes in the morning peak period, 5 minutes in the evening peak period, and between 9 and 10 minutes during off-peak periods.

Construction

Construction staging and sequencing strategies are critical to achieving the balance of an efficient construction project while minimizing the impacts to vehicular traffic, pedestrian traffic, on-street parking, public access, and emergency access in local communities. The

surrounding project area presents several construction challenges including narrow roadways, urban traffic volumes, and a variety of commercial, industrial, and residential land uses that require continuous access, and offer limited space for construction zones and lay down areas within or near the rail corridor. Existing rail service must be maintained during construction. The preliminary analysis of construction staging and sequencing shows that it is feasible to construct the project while maintaining railroad operations, access to abutters, and traffic and pedestrian paths. A comprehensive construction staging and sequencing plan would be developed and included in the final construction contract documents and communicated to the public.

The use of the existing MBTA commuter rail right-of-way for the proposed Green Line tracks greatly reduces the complexity of construction as well as construction impacts. The existing right-of-way ranges from 55 to 110 feet in width. In places where space is limited by steep slopes, retaining walls have been proposed to maximize usable space in the railroad rights-of-way. Figures ES-2 and ES-3 show cross-sections of the existing and proposed rights-of-way, respectively, along the Medford Branch.

Figure ES-2 Existing Section along Medford Branch Looking North

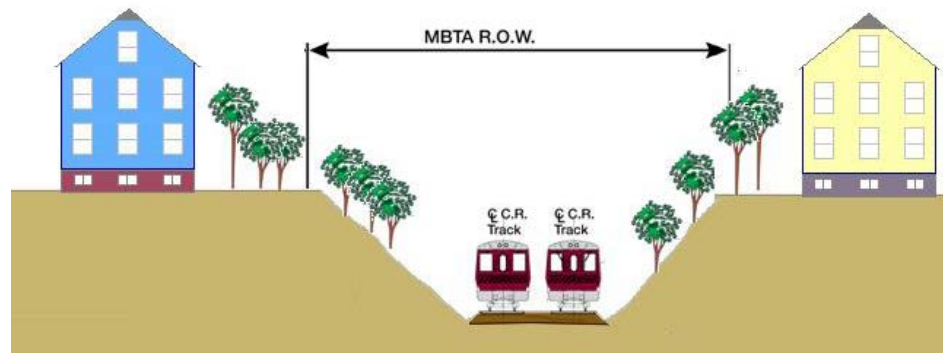
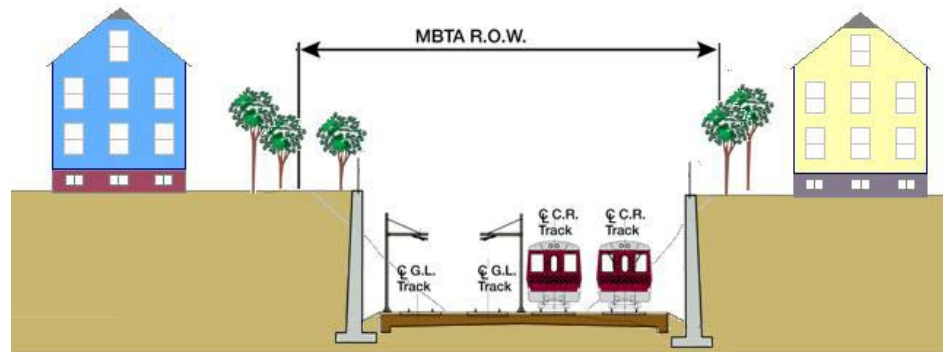


Figure ES-3 Proposed Section along Medford Branch Looking North



Bridge reconstruction would be staged whenever possible to maintain traffic and access to businesses over the bridges during construction. Construction staging would be required for roadway traffic as well as rail traffic beneath the bridge. In some cases staged construction is not feasible and the bridge would have to be closed during construction. The project would limit bridge closures such that no two consecutive bridges would be closed at the same time. Detour plans would be developed in coordination with MassDOT and the affected cities.

Construction procedures would comply with MassDEP's solid waste and air quality control regulations to control contaminated soils and protect air quality during construction.

Stations

Station locations for the project were identified through an evaluation process and working with the public and local officials. Important considerations in station siting and configuration included operations, access, and impacts to nearby properties. Stations are intended to function as neighborhood stations with no provisions for new parking, except for at the relocated Lechmere Station.

For the Medford Branch, the existing Lechmere Station would be relocated, and five new stations would be constructed at:

- Washington Street;
- Gilman Square;
- Lowell Street;
- Ball Square; and
- College Avenue.

For the Union Square Branch, a new station would be constructed along the rail corridor at Prospect Street near Union Square.

Stations were designed to meet the project's goals of improved transit access and accessibility, and to minimize impacts to the community associated with land acquisition, traffic, and loss of parking. Each station would provide designated pickup/drop-off areas, a headhouse with automated fare lines, vending machines, an information booth, and restrooms. Figures ES-4 and ES-5 show a typical station layout and elevation, respectively. All stations would incorporate sustainable design principles to the extent practical.

The design of each platform was based on projected peak hour passenger volume at each station. Station designs also took into account access to nearby bus connections. Station access and platform design were based on requirements and guidance provided by the ADA (1990) standards and the Commonwealth of Massachusetts Architectural Access Board (AAB), as well as requirements of the MBTA. Many station platforms would be located at a different elevation than the ground-level station access points. Entry to and exit from the platforms would be by elevators, escalators, and stairs.

Figure ES-4 Typical Station Layout

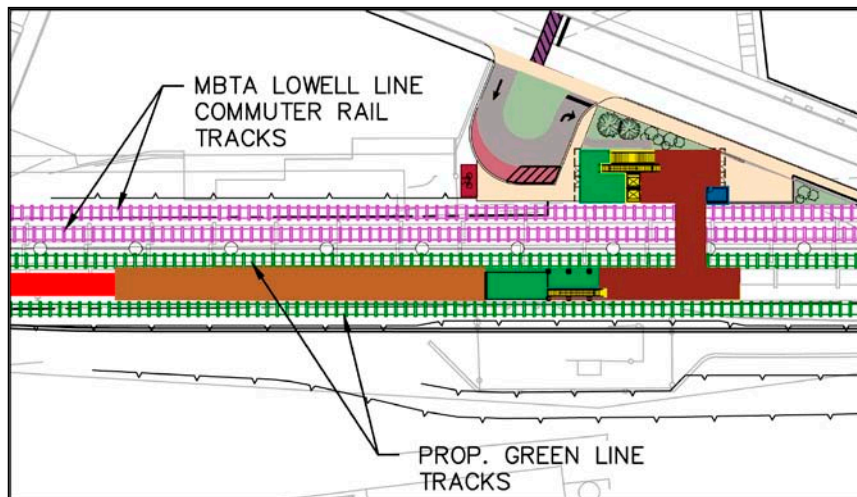
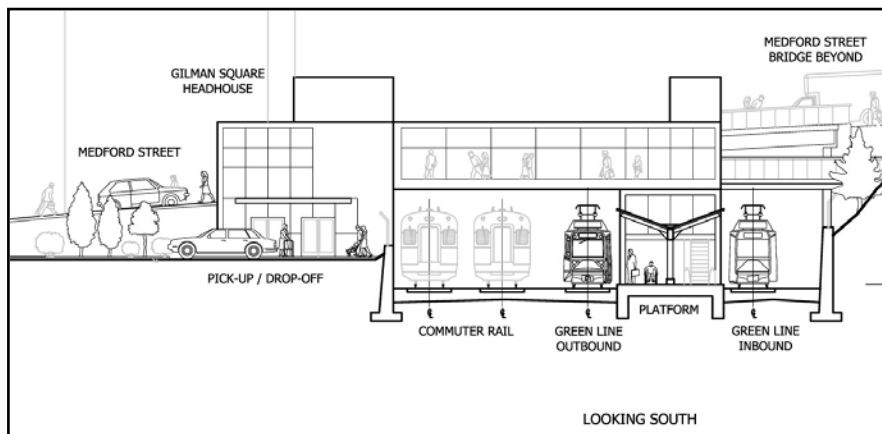


Figure ES-5 Typical Station Elevation



Maintenance and Storage Facility

There are currently no maintenance or storage facilities located on the north side of the MBTA light rail system in the proximity of the Green Line Extension project. The Proposed Action requires a new maintenance and storage facility on the north side of the Green Line system to store, inspect, maintain, and repair cars and to provide a base for the maintenance and repair of the track, power, and signal systems. An extensive and comprehensive evaluation of potential maintenance and storage facility sites was conducted. Numerous sites were considered for the new facility including the MBTA Boston Engine Terminal commuter rail maintenance facility and the site alternatives referred to in this analysis as Yard 8, Mirror H, and Option L. Since the issuance of the DEIR/EA, the Option L site has been selected as the preferred maintenance and storage facility location, since it would provide the best balance of operational and environmental benefits and impacts and would be most compatible with the long-term planning goals of local communities.

The Option L site is located immediately adjacent to and northwest of the MBTA Boston Engine Terminal, along the southern and southeastern fringe of the existing Inner Belt industrial area of Somerville. The maintenance building and associated trackwork are proposed on land adjacent to and northwest of the MBTA Boston Engine Terminal. The land is currently occupied by two businesses at 20 Third Avenue and 44-48 Third Avenue. Full acquisition of these parcels would be required. The maintenance building and east storage yard is proposed at the southern end of Inner Belt Road, just north of the MBTA Fitchburg Line, which is currently an unused parking lot for 70 Inner Belt Road and the undeveloped southern corner of 200 Inner Belt Road.

Estimated Cost

During the development of the DEIR/EA, 10 percent design concept plans for the Proposed Action and detailed capital cost estimates were developed. The capital improvements include, but are not limited to, construction of track, stations, structures, systems, drainage, utilities, and the maintenance facility. Additional costs include property acquisitions and business relocations as well as vehicle acquisition and professional services. The cost of the Proposed Action includes the cost to relocate Lechmere Station. The overall cost of the Proposed Action is currently estimated to be approximately \$971 million plus finance charges in 2011 dollars, including \$82 million for 24 additional Green Line vehicles. Annual operating and maintenance costs would be approximately \$24.5 million in 2011 dollars. The total costs for the Proposed Action were further refined to include inflation for the time period in which the project is to be implemented (2019). YOE capital costs for the Proposed Action were calculated to be approximately \$1.1 billion, plus finance charges, in YOE dollars.

Somerville Community Path

The Somerville Community Path currently travels through the Davis Square area of Somerville and connects with other elements of the regional multi-use path system in Cambridge, Belmont, and Arlington. A proposed extension of the Somerville Community Path would create a new connection of the Path from its anticipated terminus at Lowell Street in Somerville to the Inner Belt area (also in Somerville), with potential connections to East Cambridge and Boston. In general terms, the proposed route follows the edge of the MBTA Lowell Line, generally located at street level, while the existing heavy rail and proposed Green Line trains would run below grade, in a cut section.

As part of its commitment to the Somerville community, MassDOT has agreed to complete all planning, design, and engineering work - including the identification of necessary property acquisitions - for the proposed extension of the Somerville Community Path between Lowell Street and Inner Belt Road. However, the City of Somerville remains the chief proponent for the extension of the Community Path. Wherever possible, MassDOT would design the extension of the Community Path in such a way that direct connections can be made from the Community Path extension into the unpaid area of Green Line Extension stations.

The Green Line Extension project and the Somerville Community Path are separate and distinct projects, with their own project-development trajectories and timelines.

What are the Proposed Action's Benefits and Impacts?

This EA evaluates the Proposed Action's impacts – both beneficial and adverse – on natural and human resources. These impacts were compared to the effects of the No-Build Alternative, in the year 2030. The Proposed Green Line Extension project offers benefits with minimal impact to the project study area by virtue of the fact that it would be constructed within existing MBTA rail rights-of-way, which would enable light rail service to serve pedestrian-oriented centers with minimal disruption to the surrounding community and without considerable property acquisitions or neighborhood impacts. Benefits and adverse impacts of the Proposed Action include:

- ▶ **Land Use, Social and Economic Resources** – The Proposed Action is expected to decrease low intensity commercial and light industrial uses in the project study area and increase mixed-use, high-density transit-oriented development, particularly at Union Square Station and Ball Square Station. The Proposed Action would increase transit access for the local communities, which increases both the potential for local commerce and the potential for area residents to commute to jobs elsewhere. Approximately 15.2 acres of land from 40 properties is required for the Proposed Action (including four parcels totaling 10.2 acres for the proposed maintenance and storage facility). The displacement and relocation of four active businesses would be required; however, no residences would be displaced. Property acquisitions would reduce annual property tax revenue by \$7,099 in Cambridge, \$17,945 in Medford, and \$420,188 in Somerville. A total of 204 jobs would be displaced or relocated, the majority of which (194 jobs) are currently held in Somerville. All property acquisitions and relocations will be conducted in compliance with the Uniform Relocation Act.⁸ Additional information is included in Section 6.2, *Land Use*, and Section 6.3, *Socioeconomic Impacts*, of this EA.
- ▶ **Environmental Justice** – There would be no disproportionate impacts to environmental justice populations from the Proposed Action. The Proposed Action would increase transit access to jobs, colleges, and health care for environmental justice and disability populations. Access for environmental justice populations would improve approximately 3.7 to 4.8 percent for employment opportunities, approximately 9.3 percent to colleges, and approximately 1.5 percent to hospitals. Access for disability populations would improve approximately 6 to 7 percent for employment opportunities, approximately 15.5 percent to colleges, and approximately 2.5 percent to hospital beds. Regional transportation investment funds would be focused on established environmental justice populations, connecting residents to jobs and services in Boston and Cambridge and strengthening business and residential districts in the project study area. Additional information is included in Section 6.4, *Environmental Justice*, of this EA.
- ▶ **Traffic** – The Proposed Action would not have an adverse impact on traffic operations in the project study area. The Proposed Action would provide roadway and signal modifications at 12 intersections to prevent adverse traffic impacts from the project. The Proposed Action would provide pedestrian improvements at 29 locations to improve pedestrian flow and safety. Future connections from bicycle routes directly to the proposed stations would be possible. Bicycle parking would be provided to accommodate and encourage commuting by bicycle. Fewer than 12 parking spaces would be permanently impacted on Boston Avenue near Winthrop Street. Temporary lane closures, traffic detours, and displacement of on-street parking in some locations could occur during construction. Additional information is included in Section 6.5, *Traffic and Transportation Systems*, of this EA.

⁸ United States Department of Transportation. 49 CFR Part 24, *Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970*, as amended. Public Law 91-646, January 2, 1971. Available at: <http://www.fhwa.dot.gov/realestate/ua/uraguide3805.pdf>

- ▶ **Air Quality** – The Proposed Action would provide important air quality benefits and would fulfill a longstanding commitment to incorporate transit projects as an integral element of the Central Artery/Tunnel project. The Proposed Action would reduce daily VMT by 25,728, improving air quality and providing zero-emission transportation capacity for anticipated growth. The proposed Green Line Extension project complies with the Clean Air Act Amendments (CAAA). Additional information is included in Section 6.6, *Air Quality*, of this EA.
- ▶ **Noise** – Although the Proposed Action would introduce a new noise source into the project study area, proposed noise barriers, potential sound insulation, and rail lubrication would be effective in mitigating potential noise increases. Without mitigation, 152 noise-sensitive receptors would be exposed to noise increases including 108 moderate impacts and 40 severe impacts at single-family and multi-family residential buildings, moderate impact at Tufts University Science and Technology Center and Outside the Line Artist’s Studio (a teaching facility), moderate impact at Trum Playground, severe impact at the Walnut Street Center (a non-profit support center for adults with developmental disabilities) near Union Square and ground-borne noise impact at Tufts Bacon Hall and Tufts Curtis Hall. For locations along the existing commuter rail lines, the future noise levels are expected to be substantially lower than the existing noise levels due to the noise barriers. Temporary noise impacts could result from construction activities. Additional information is included in Section 6.7, *Noise*, of this EA.
- ▶ **Vibration** – The proposed vibration mitigation for the proposed Green Line Extension project would keep vibration levels at or below existing levels for commuter trains and reduce vibration from Green Line trains below the FTA’s impact criteria. Proposed mitigation includes ballast mats, resiliently supported ties or resilient rail fasteners on the proposed Green Line tracks and the relocated commuter rail tracks, and relocation or use of specially engineered trackwork. Without mitigation, 88 vibration-sensitive receptors would be exposed to vibration impact including 83 single-family or multi-family residential properties and the Science and Technology Center, Bacon Hall, Bray Labs, and Curtis Hall at Tufts University, and Outside the Line Artist Studio. Additional information is included in Section 6.8, *Vibration*, of this EA.
- ▶ **Stormwater** – The Proposed Action would result in an overall decrease of 1.2 acres of impervious area as compared to the No-Build Alternative. This reduction is accomplished mainly by removing existing structures and impervious parking areas and replacing them with areas of new track and ballast for the construction of the maintenance and storage facility. Following construction of the facility, approximately 40 percent (3.4 acres) of the impervious area would be roof tops, which are expected to generate clean runoff except for airborne deposits. Stormwater Best Management Practices (BMPs) would be used during construction to minimize impacts from construction activities. Additional information is included in Section 6.9, *Stormwater*, of this EA.

- **Fish, Wildlife and Plants** – The Proposed Action would not have an adverse effect on fish, wildlife, or plants. There are no Federal or state-listed endangered or threatened species present within the project study corridor. Additional information is included in Section 6.10, *Fish, Wildlife, and Plants*, of this EA.
- **Wetlands** – There are no Federal- or state-regulated wetlands within the project study corridor.
- **Parks and Recreation Areas** – The Proposed Action would not directly impact any publicly owned parks or recreation areas along the corridor. Additional information is included in Section 6.11, *Parks and Recreation Areas*.
- **Visual** – The Proposed Action would have a minor effect on the local visual environment within the majority of the corridor. The proposed trackwork would be largely within the depressed rights-of-way, below the normal visible landscape. The stations would be along and within the right-of-way to the greatest extent possible, minimizing the overall visual impact. The new stations would be visible from their street access points and from nearby bridges.

The local community would experience temporary visual impacts during construction. The Proposed Action would require acquiring property, demolishing buildings, constructing new Green Line track and stations, and relocating the commuter rail track within the existing right-of-way.

Consultation with the MHC and the Somerville Historic Preservation Commission will ensure the design of a noise barrier behind the National Register-listed Susan Russell House and the design of the Gilman Square Station and Lowell Street Station are context sensitive. The loss of wooded areas along the rights-of-way would be a visual change, but landscaping and noise barriers would reduce the overall visual effect of vegetation losses. Additional information is included in Section 6.12, *Visual Environment*, of this EA.

- **Cultural Resources/Section 106 of the National Historic Preservation Act** – The Proposed Action would have an adverse effect on seven historic resources listed or eligible for listing on the National Register of Historic Places:
 - National Register-eligible Lechmere Viaduct in Boston and Cambridge (for acquisition and demolition of the steel elevated portion);
 - National Register-listed Charles River Basin Historic District (for acquisition and demolition of a portion of the Lechmere Viaduct, a contributing structure to the District);
 - National Register-eligible Lechmere Station in Cambridge (for abandonment and demolition);
 - National Register-eligible Somerville Automobile Company in Medford and Somerville (for acquisition and demolition);
 - National Register-listed Susan Russell House in Somerville (for potential visual impacts resulting from noise barriers);

- National Register-eligible Gilman Square Historic District in Somerville (for potential visual impacts due to the proposed Gilman Square Station); and
- National Register-eligible Powder House/Winter Hill Historic District in Somerville (for potential visual impacts due to the proposed Lowell Street Station).

A Memorandum of Agreement (MOA) (provided in Appendix G, *Memorandum of Agreement*) has been developed that specifies the measures that would be implemented to mitigate the adverse effects. Mitigation measures, including archival photographic documentation and historical interpretation, are discussed in the MOA and also in Chapter 7, *Project and Mitigation Commitments*, of this EA.

Noise barriers would indirectly impact the visual environment of the National Register-eligible Tufts University Curtis Hall, but would not change its historic architectural character. Track vibration isolation (such as ballast mats, floating slabs, and special trackwork and fasteners) would effectively mitigate potential vibration impact at the National Register-eligible Tufts University Bray Laboratory property, leaving no residual effect from vibration.

Two areas of archeological sensitivity were previously identified within the project Area of Potential Effect (APE). The project construction would not affect one area, and subsequent investigations found that there is extensive fill and/or previously disturbed belowground soil contexts at the second location. Therefore, it is unlikely that intact archeological resources would be discovered during construction. However, should any unidentified archaeological resources be discovered during construction, MassDOT would ensure that appropriate notification and preservation procedures are followed, as stipulated in the MOA (Appendix G, *Memorandum of Agreement*). Additional information is included in Section 6.13, *Cultural Resources*, of this EA.

- **Hazardous Materials** – Phase I Environmental Site Assessments conducted for the properties required for acquisition identified 28 Recognized Environmental Concerns (RECs) that would be addressed during construction. The Proposed Action would remediate these sites within the project boundaries that contain contaminated soils. Each REC and associated impact to the project will be assessed at the completion of Phase II subsurface investigations currently being conducted in order to better estimate disposal costs and potential regulatory obligations. Hazardous materials management protocols during construction would include special handling, dust control, and management and disposal of contaminated soil and groundwater in order to prevent construction delays and to provide adequate protection to workers and any nearby sensitive receptors. Additional information is included in Section 6.14, *Hazardous Materials and Solid Waste*, of this EA.
- **Indirect and Cumulative Impacts** – The Proposed Action would not have adverse indirect and cumulative impacts. The extension of rail service through the project study area provides opportunities for the cities to modify their zoning and create infill development. The Proposed Action would support a number of major redevelopment projects that are currently planned and underway near the proposed

station sites. The Green Line Extension project would focus growth into patterns and places that would increase the number of viable travel options available to corridor residents and employees, including transit, walking, and bicycling. While these development projects could help boost the regional economy and the study area neighborhoods, local public policy to preserve affordability for moderate-income residents and small businesses should be implemented to mitigate transit-related increases in land values, which could result in neighborhood gentrification. Additional information is included in Section 6.15, *Indirect and Cumulative Effects*, of this EA.

- **Section 4(f) Resources** – The Proposed Action would not directly impact or result in a constructive use of publicly owned park, recreation area or wildlife and waterfowl refuge, protected by Section 4(f) of the U.S. Department of Transportation Act of 1966.⁹ Additional information is included in Chapter 8, *Section 4(f) Evaluation*, of this EA. The Proposed Action would require the use of four National Register-eligible historic properties through the alteration of land currently used for transportation purposes or permanent acquisition of additional land for transportation purposes. Avoidance alternatives were evaluated and there are no feasible and prudent alternatives to avoid the use of property from the following historic resources:
 - The Lechmere Viaduct in Boston and Cambridge (due to partial demolition of property);
 - The Lechmere Station in Cambridge (due to abandonment and demolition of property);
 - The Somerville Automobile Company in Medford and Somerville near the proposed Ball Square Station (due to acquisition and demolition of property); and
 - The Reid and Murdock Company Warehouse, located within the National Register-eligible Gilman Square Historic District, in Somerville (partial acquisition and demolition of adjacent parking area and a railroad loading dock in the rear [south] elevation).¹⁰

⁹ Section 4(f) of the United States Department of Transportation Act of 1966 (Amended March 12, 2008 in 73 FR 13395; implemented at 23 U.S.C. 138 and recodified at 49 United States Code, Subtitle I, Section 303(c). Available at: <http://www.gpo.gov/fdsys/pkg/FR-2008-03-12/pdf/E8-4596.pdf>

¹⁰ The Proposed Action requires partial acquisition of non-contributing elements of the National Register-eligible Reid and Murdock Company Warehouse property and blockage of access to a 3-bay garage, which was determined as a no adverse effect under Section 106 of the NHPA; however, a portion of the property would be acquired resulting in a Section 4(f) use.

MassDOT's Project and Mitigation Commitments

Potential permanent impacts resulting from constructing the Proposed Action would be mitigated to the extent practicable, as described in Chapter 7, *Project and Mitigation Commitments*, of this EA and summarized in Table ES-2.

Temporary, short-term impacts from construction activities would be mitigated to the extent practicable. Appropriate construction mitigation measures would be incorporated into the contract documents and specifications governing the activities of contractors and subcontractors constructing elements of the Proposed Action. On-site resident engineers and inspectors would monitor all construction activities to ensure that mitigation measures are properly implemented. This monitoring will include maintaining a "Tracking Sheet" that will be included with project status reports. The construction mitigation measures are summarized in Table ES-3.

MassDOT and the MBTA are committed to continuing a robust public involvement process during the construction of the Green Line Extension project. The process would a) inform the public of construction plans, b) provide regular updates on construction, traffic detours, impacts, and mitigation measures, and c) solve problems that arise during construction. MassDOT and the MBTA would achieve these goals in part by requiring the Green Line Extension project construction contractor to commit to a spectrum of outreach activities and efforts to mitigate the impacts of construction. MassDOT and the MBTA would hold the construction contractor to these obligations. Working together, agency and contractor staff members would be dedicated to implementing these communication and problem-solving strategies. Key elements of the construction outreach plan are provided in Table ES-3.

Table ES-2 Project and Mitigation Commitments

Human and Environmental Resources	Mitigation Measure	Implementation Schedule	Implementation Responsibility
Traffic and Transportation Systems	Provide roadway and signal modifications at 12 specific intersections in order to prevent adverse traffic impacts from the project (See Section 7.3.3 and Figure 5.6-1, of this EA):	Within 12 months after revenue service	MBTA D/B Contractor ¹
	<ul style="list-style-type: none"> ➤ Boston Avenue at Winthrop Street ➤ Boston Avenue at College Avenue ➤ Washington Street at McGrath Highway ➤ Prospect Street at Somerville Avenue ➤ Washington Street at Somerville Avenue/Webster Street ➤ Washington Street at Tufts Street ➤ Medford Street at Pearl Street ➤ Broadway at Boston Avenue/Rogers Avenue ➤ Monsignor O'Brien Highway at Third Street ➤ Monsignor O'Brien Highway at Water Street ➤ Monsignor O'Brien Highway at North First Street/East Street/Cambridge ➤ Cambridge Street at First Street 		
	Provide pedestrian improvements at 29 specific locations to improve pedestrian flow and safety (See Section 7.3.3, Table 7.3-1, and Figure 5.6-1, of this EA):	Within 12 months before revenue service	MBTA D/B Contractor ¹
	<ul style="list-style-type: none"> ➤ Boston Avenue at North Street ➤ Boston Avenue at Winthrop Street ➤ Boston Avenue between Winthrop Street and College Avenue (mid-block) ➤ Boston Avenue at Harvard Street ➤ Powder House Rotary ➤ Boston Avenue at Broadway ➤ College Avenue between Boston Street and Frederick Avenue (mid-block) ➤ College Avenue at George Street ➤ Main Street at George Street ➤ Main Street at Mystic Valley Parkway Ramps ➤ Main Street at Harvard Street ➤ Main Street at Mystic Avenue ➤ Medford Street at Broadway ➤ Medford Street at Lowell Street ➤ Medford Street at Central Street ➤ Medford Street at School Street ➤ Medford Street at Pearl Street ➤ Medford Street at Walnut Street ➤ Medford Street at Highland Avenue ➤ Highland Avenue at Lowell Street ➤ Highland Avenue at Central Street ➤ Washington Street at McGrath Highway ➤ Washington Street at Tufts Street ➤ Washington Street at Inner Belt Road 		

Table ES-2 Project and Mitigation Commitments (Continued)

Human and Environmental Resources	Mitigation Measure	Implementation Schedule	Implementation Responsibility		
Traffic and Transportation Systems (continued)	<ul style="list-style-type: none"> ➤ Medford Street at Somerville Avenue /McGrath Highway ➤ Washington Street at Somerville Avenue/Prospect Street ➤ Washington Street at Somerville Avenue/Webster Street ➤ Washington Street at Kirkland Street ➤ Prospect Street at Webster Street 	Within 12 months after revenue service	MBTA D/B Contractor ¹		
	Optimize traffic signal timing and phasing to maximize the efficiency of signalized intersections in the Proposed Action.			Within 12 months before revenue service	MBTA D/B Contractor ¹
	Work with cities to develop station-area parking enforcement plans.			Within 12 months before revenue service	MBTA
	Work with the MBTA to evaluate opportunities to improve connections between the new stations and existing bus connections.			During design and construction	MBTA D/B Contractor ¹
	Work with cities and applicable emergency personnel during design of intersection mitigation measures, including the development of construction management and detour plans.			During design and construction	MBTA PM/CM Team ²
Noise	<p>Mitigate noise impacts by providing noise barriers or sound insulation. Provide mitigation for moderate noise impact where existing day-night sound levels (Ldn) are above 65 dBA. Provide mitigation for impacts with no significant outdoor land use if interior noise levels are above 45 dBA from project sources or single-event maximum noise levels (Lmax) above 65 dBA. Provide 17 noise barriers totaling approximately 12,700 feet in length at the following locations (See Section 7.3.4, Tables 7.3-6 and 7.3-7, and Figures 6.7-1 to 6.7-6, of this EA.):</p> <ul style="list-style-type: none"> ➤ N1 - Glass Factory Condominiums and Hampton Inn (1,400 feet) ➤ N2 - Brickbottom (northeast façade) (1,350 feet) ➤ N3 - Brickbottom (south façade) (1,400 feet) ➤ N4 - Alston Street (300 feet) ➤ N5 - Between Cross Street and McGrath Highway (Avon Place) (500 feet) ➤ N6 - Between McGrath Highway and Walnut Street (Gilman Street) (750 feet) ➤ N7 - Between School Street and Sycamore Street (Richdale Avenue) (850 feet) ➤ N8 - Sycamore Street near Richdale Avenue (200 feet) ➤ N9 - Vernon Street (750 feet) ➤ N10 - Nashua Street/Henderson Street/Hinckley Street (1,000 feet) ➤ N11 - Trum Playground (100 feet) ➤ N12 - Cedar Street and Wilson Avenue (400 feet) ➤ N13 - Between Cedar Street and Broadway (Broadway) (800 feet) 	Early phases of construction, where appropriate	MBTA D/B Contractor ¹		

Table ES-2 Project and Mitigation Commitments (Continued)

Human and Environmental Resources	Mitigation Measure	Implementation Schedule	Implementation Responsibility
Noise (continued)	<ul style="list-style-type: none"> ➤ N14 - Newbern Avenue/Morton Avenue/Granville Avenue (1,200 feet) ➤ N15 - Burget Avenue (850 feet) ➤ N16 - Horace Street (250 feet) ➤ N17 - Walnut Street Center (600 feet) 	Early phases of construction, where appropriate	MBTA D/B Contractor ¹
	<p>Provide sound insulation improvements at the following locations (See Section 7.3.4 and Figures 6.7-1 to 6.7-6, of this EA.):</p> <ul style="list-style-type: none"> ➤ Pearl Street Apartment building ➤ Powderhouse Condominiums ➤ Outside the Lines Studio building ➤ Tufts University Science and Technology Center 	Early phases of construction, where appropriate	MBTA D/B Contractor ¹
	<p>Monitor noise after service starts (with the proposed mitigation in place) to evaluate whether the actual noise levels correspond with the modeled values and take appropriate corrective actions if the actual values are found to be higher than the projections.</p>	Within 12 months after revenue service	MBTA PM/CM Team ²
Vibration	<p>Mitigate vibration impacts by providing a total of 21,500 track-feet of track vibration isolation in the form of ballast mats, resiliently supported ties or resilient rail fasteners at the following 19 locations (See Section 7.3.5, Table 7.3-9 and Figures 6.7-1 and 6.8-1 to 6.8-5, of this EA.):</p> <ul style="list-style-type: none"> ➤ V1 - Glass Factory Condominiums ➤ V2 - Brickbottom Artists Building (northeast façade) ➤ V3 - Brickbottom Artists Building (south façade) ➤ V4 - Alston Street (south of Cross Street) ➤ V5 - Tufts Street/Avon Place/Auburn Avenue (south of Cross Street to McGrath Highway) ➤ V6 - Gilman Street (McGrath Highway to Walnut Street) ➤ V7 - Medford Street (north of Walnut Street) ➤ V8 - Pearl Street Apartments ➤ V9 - Richdale Avenue (School Street to Sycamore Street) ➤ V10 - Lowell Street/Nashua Street/Hinckley Street/Berwick Street (Lowell Street to Charles E Ryan Road) ➤ V11 - Murdock Street (south of Cedar Street) ➤ V12 - Cedar Street (north of Cedar Street) ➤ V13 - Newbern Avenue/Morton Avenue/Granville Avenue/Winchester Place/Wareham Street (Broadway to Warren Street) ➤ V14 - Tufts Science and Technology Center ➤ V15 - Tufts Bacon Hall ➤ V16 - Outside the Lines Artist Studio ➤ V17 - Tufts Bray Laboratory ➤ V18 - Tufts Curtis Hall ➤ V19 - Horace Street 	Within 12 months before revenue service	MBTA D/B Contractor ¹

Table ES-2 Project and Mitigation Commitments (Continued)

Human and Environmental Resources	Mitigation Measure	Implementation Schedule	Implementation Responsibility
Vibration (continued)	Relocate specially engineered trackwork to further minimize or mitigate potential vibration impacts at the following crossover and turnout locations (See Section 7.3.5, Table 7.3-10 and Figures 6.7-1 and 6.8-1 to 6.8-5, of this EA):	PE Design Phase	MBTA PM/CM Team ²
	<ul style="list-style-type: none"> ➤ A - Brickbottom Artists Building South Façade Green Line Turnout (Union Square Outbound Mainline to Union Square Outbound Yard Lead) ➤ B - Brickbottom Artists Building South Façade Green Line Turnout (Union Square Inbound Mainline to Union Square Inbound Yard Lead) ➤ C - Brickbottom Artists Building South Façade Two Commuter Turnouts (Fitchburg Mainline to BET Drill Track and to Spur Line) ➤ D - Granville Avenue / Winchester Place Commuter Interlocking (two double crossovers) ➤ E - College Avenue Green Line Number 8 Double Diamond Crossover 		
	Monitor vibration after service starts (with proposed mitigation in place) to evaluate whether the actual vibration levels correspond with the modeled values and take appropriate corrective actions if the actual values are found to be higher than the projections	Within 12 months after revenue service	MBTA PM/CM Team ²
Hazardous Materials	Consult with MassDEP during design and construction to ensure planning and implementation of demolition and management of contaminated soils is consistent with applicable MassDEP regulations and recommendations.	During design and construction	MBTA Environmental Team ³
Socioeconomics	In accordance with Uniform Act procedures, work with property owners to provide fair market value of acquisition and job relocations.	Prior to beginning of construction	MassDOT/ MBTA Real Estate Team ⁴
Land Use	Work with the community in the area of the future Mystic Valley/Route 16 to consider land use and station design elements.	Prior to beginning of construction	MassDOT/ MAPC
	Complete the final design for the proposed Somerville Community Path between Lowell Street and the Inner Belt area. Work with City of Somerville to identify opportunities for state and Federal funding for construction of Community Path.	Within 12 months before revenue service	MBTA PM/CM Team ²
Water Quality/ Stormwater	Update the Operation and Maintenance plan in the Stormwater Pollution Prevention Plan (SWPPP) to include a detailed outline of inspection and cleaning schedules for stormwater management practices, including detention areas and deep sump catch basins.	Within 12 months before revenue service	MBTA D/B Contractor ¹
	Implement all aspects of the SWPPP including recommendations in annual updates based on new or improved procedures or changes to operations.	Within 12 months after revenue service	MBTA D/B Contractor ¹
Visual Environment	Provide vegetation on and/or above retaining walls to minimize visual changes.	During design and construction	MBTA D/B Contractor ¹
	Work with affected communities on design of noise barriers and vegetated walls.	PE Design Phase	MBTA PM/CM Team ²

Table ES-2 Project and Mitigation Commitments (Continued)

Human and Environmental Resources	Mitigation Measure	Implementation Schedule	Implementation Responsibility
Cultural Resources and Section 4(f) Resources	Perform archival photographic and written documentation of historic structures to be removed or altered (Lechmere Station/Lechmere Viaduct, Somerville Automobile Company Building)	Prior to beginning of construction	MBTA D/B Contractor ¹
	Following MBTA design protocol review, develop interpretative displays of Lechmere Station/Lechmere Viaduct and the Somerville Automobile Company Building, in consultation with the FTA, the MHC and relevant historical commissions.	During design and construction	MBTA D/B Contractor ¹
	Submit design plans and construction specifications for project elements that affect above-ground historic properties for review by MHC, local historical commissions, and the Design Working Group.	Prior to beginning of construction	MBTA PM/CM Team ²
	Construct noise barrier adjacent to historic Susan Russell House with context-sensitive materials and colors.	During design and construction	MBTA D/B Contractor ¹
Public Involvement	Continue civic engagement opportunities during the design process. Provide transparent public information and outreach process through construction.	Duration of project	MassDOT/ MBTA
	Engage interested parties through the Design Working Group.	Duration of project	MassDOT/ MBTA
	Conduct land use workshops with affected communities to further identify community needs and issues near the proposed station areas.	Completed in May/June 2010	MassDOT
Design	As design advances, facilitate future transit/transportation projects such as light rail expansion or connections to existing infrastructure to the extent possible.	Prior to beginning of construction	MBTA D/B Contractor ¹
	Implement "green" design elements (recycled or recyclable materials or incorporate vegetation) in design of proposed retaining walls, stations and maintenance and storage facility.	During design and construction	MBTA D/B Contractor ¹
	During design, refine project designs to further minimize temporary and permanent impacts on local neighborhoods and property owners.	Prior to beginning of construction	MBTA D/B Contractor ¹
	Design all stations in compliance with ADA standards, Massachusetts AAB standards; MBTA's settlement agreement with the Boston Center for Independent Living (BCIL) and applicable National Fire Protection Association standards.	Prior to beginning of construction	MBTA D/B Contractor ¹

1 MBTA D/B Contractor = Contractor selected and coordinated by the MBTA to handle Design and Build phase of the project
 2 MBTA PM/CM Team = Team selected by the MBTA to handle Program Management, Contract Management and oversight of Preliminary Engineering.
 3 MBTA Environmental Team = MBTA Environmental Department Staff
 4 MBTA Real Estate Team = MBTA Real Estate Department Staff and asset manager Transit Realty Associates (TRA)
 TBD = To be determined during final design
 N/A = Cost not applicable for this item

Table ES-3 Summary of Construction Period Mitigation Commitments to be Implemented by MBTA D/B Contractor during Construction

Environmental Categories	Mitigation	Implementation Schedule	Implementation Responsibility
General	<ul style="list-style-type: none"> ➤ Prior to construction, prepare a detailed plan to address various construction period impacts to various environmental resources (vehicular traffic, pedestrian and bicycle, on-street parking, public access, emergency access to local businesses and residences, dust, noise, odor, rodents, construction-related nuisance conditions) through coordination with cities and appropriate emergency personnel. 	Prior to construction	MBTA PM/CM Team ¹
Traffic and Transportation Systems	<ul style="list-style-type: none"> ➤ Establish temporary detours to minimize traffic disruptions due to construction. ➤ Stage bridge construction to ensure that adjacent bridges are not closed simultaneously. ➤ Work with cities and applicable emergency personnel to ensure that appropriate safety measures are incorporated throughout construction. 	During construction	MBTA D/B Contractor ²
Air Quality	<ul style="list-style-type: none"> ➤ Apply water to dry soil to prevent dust production. ➤ Use water for compaction in the fill areas and as a dust retardant in both the soil cut areas and haul roads. ➤ Follow existing MassDEP's Solid Waste and Air Quality Control regulations and MBTA retrofit procedures for construction equipment to reduce emissions. ➤ Comply with MassDEP's idling regulations. Post idling restriction signage on project construction sites. 	During construction	MBTA D/B Contractor ²
Noise	<ul style="list-style-type: none"> ➤ Prepare a Noise Control Plan in conjunction with the contractor's specific equipment and methods of construction. ➤ Use specially quieted equipment with enclosed engines and/or high-performance mufflers. ➤ Perform construction equipment noise certification testing. ➤ Avoid nighttime construction in residential neighborhoods. ➤ Require ambient-adjusting or manually adjusted backup alarms set to 5 dBA over background levels. ➤ Keep truck idling to a minimum. ➤ Set acoustic shield requirement for jackhammers, chainsaws, and pavement breakers. ➤ Develop methods for projecting construction noise levels. ➤ Develop methods for responding to community complaints. ➤ Establish a protocol for reporting noise monitoring results, noise reduction measures used, and responses to the community. 	During construction	MBTA D/B Contractor ²

Table ES-3 Summary of Construction Period Mitigation Commitments to be Implemented by MBTA D/B Contractor during Construction (Continued)

Environmental Categories	Mitigation	Implementation Schedule	Implementation Responsibility
Noise (continued)	➤ Use shields, shrouds, or intake and exhaust mufflers to control construction noise level	During construction	MBTA D/B Contractor ²
	➤ Apply noise deadening materials to chutes or storage bins.	During construction	MBTA D/B Contractor ²
	➤ Install temporary noise barriers.	During construction	MBTA D/B Contractor ²
	➤ Apply acoustic enclosures.	During construction	MBTA D/B Contractor ²
	➤ Implement specialized back-up alarms.	During construction	MBTA D/B Contractor ²
	➤ Limit the size of generators and the duration of their use.	During construction	MBTA D/B Contractor ²
	➤ Develop truck routes that minimize exposure to noise-sensitive sites.	During construction	MBTA D/B Contractor ²
	➤ Develop other detailed engineering noise control measures, as appropriate.	During construction	MBTA D/B Contractor ²
	➤ Route construction equipment and vehicles through areas that would cause the least disturbance to nearby receptors where possible.	During construction	MBTA D/B Contractor ²
	➤ Fit any air-powered equipment with pneumatic exhaust silencers.	Prior to construction	MBTA D/B Contractor ²
	➤ Locate stationary construction equipment as far as possible from noise-sensitive sites.	During construction	MBTA D/B Contractor ²
	➤ Construct noise barriers, such as temporary walls or piles of excavated material, between noisy activities and noise-sensitive receivers.	Prior to construction	MBTA D/B Contractor ²
➤ Monitor noise after service starts (with the proposed mitigation in place) to evaluate whether the actual noise levels correspond with the modeled values and take appropriate corrective actions if the actual values are found to be higher than the projections.	Within 12 months after revenue service	MBTA PM/CM Team ¹	
Vibration	➤ Configure truck routes that minimize exposure to vibration sensitive receptors and maintain smooth roadway surfaces.	During construction	MBTA D/B Contractor ²
	➤ Avoid nighttime construction in residential neighborhoods.	During construction	MBTA D/B Contractor ²
	➤ Use alternative construction methods to minimize the use of impact and vibratory equipment (e.g., pile drivers and compactors).	During construction	MBTA D/B Contractor ²
	➤ Monitor vibration after service starts (with the proposed mitigation in place) to evaluate whether the actual vibration levels correspond with the modeled values and take appropriate corrective actions if the actual values are found to be higher than the projections.	Within 12 months after revenue service	MBTA PM/CM Team ¹
Water Quality/ Stormwater	➤ Install detention and infiltration systems to infiltrate peak runoff and to prevent any increase in peak flows to municipal stormwater drainage systems and to remove total suspended solids (TSS) from stormwater runoff prior to discharge.	During construction	MBTA D/B Contractor ²
	➤ Install hydrodynamic particle separators to treat pavement runoff.	During construction	MBTA D/B Contractor ²

Table ES-3 Summary of Construction Period Mitigation Commitments to be Implemented by MBTA D/B Contractor during Construction (Continued)

Environmental Categories	Mitigation	Implementation Schedule	Implementation Responsibility
Water Quality/ Stormwater (continued)	➤ Reinforce slopes using a hydroseed mix with a resin base, native vegetation, or other approved methods.	During construction	MBTA D/B Contractor ²
	➤ Use Low Impact Development practices, where feasible, to maintain natural hydrology (e.g., raingardens to treat disconnected roof drainage and/or parking runoff).	During construction	MBTA D/B Contractor ²
	➤ Develop and implement a SWPPP in accordance with NPDES and MassDEP standards.	Prior to construction	MBTA Design Team ³
	➤ Stabilize any highly erosive soils with erosion control blankets and other stabilization methods, as necessary.	During construction	MBTA D/B Contractor ²
	➤ Use dewatering controls, if necessary.	During construction	MBTA D/B Contractor ²
	➤ Install a gravel entrance at construction sites to prevent sediment from being tracked onto roadways and potentially discharged to surface waters.	During construction	MBTA D/B Contractor ²
	➤ Maintain construction equipment to prevent oil and fuel leaks and install catch basin protection as needed.	During construction	MBTA D/B Contractor ²
Hazardous Materials	➤ Consult with MassDEP to ensure planning and implementation of demolition and management of contaminated soils is consistent with applicable MassDEP regulations and recommendations.	During design and construction	MBTA Environmental Team with D/B Contractor ^{2, 4}
	➤ Follow all protocols to adequately characterize, stockpile and dispose of materials encountered during construction.	During design and construction	MBTA D/B Contractor ²
Outreach	➤ Establishing a project construction office.	During construction	MBTA D/B Contractor ²
	➤ Establishing a Green Line Extension project Ombudsman position who would field all construction-period comments and complaints, coordinate with the cities, and respond to public concerns.	During construction	MBTA D/B Contractor ²
	➤ Establish a Construction Working Group to advise MassDOT and the MBTA.	During construction	MBTA D/B Contractor ²
	➤ Establish a project email address and 24-hour phone hotline for public concerns.	During construction	MBTA
	➤ Provide frequent website updates of construction activities at www.mass.gov/greenlineextension	During construction	MassDOT/MBTA
	➤ Host neighborhood construction kick-off meetings.	During construction	MBTA D/B Contractor ²
	➤ Produce quarterly construction updates.	During construction	MBTA D/B Contractor ²
	➤ Develop a business outreach plan to assist local businesses during construction.	During construction	MBTA D/B Contractor ²

¹ MBTA PM/CM Team = Team selected by the MBTA to handle Program Management, Construction Management and oversight of Preliminary Engineering.

² MBTA D/B Contractor = Contractor selected and coordinated by the MBTA to handle Design and Build phase of the project

³ MBTA Design Team = MBTA management team that oversees design and construction projects.

⁴ MBTA Environmental Team = MBTA Environmental Department Staff

What Permits and Approvals are Required?

The Proposed Action would require permits and approvals from several local, state, and Federal agencies, as listed in Table ES-4.

Table ES-4 Possible Permits or Approvals

Agency	Approval or Permit
U.S. Environmental Protection Agency Region I	<ul style="list-style-type: none"> ➤ Compliance with NPDES National Construction General Permit for stormwater discharges during construction ➤ Compliance with NPDES Small Municipal Separate Storm Sewer System (MS4) General Permit
Massachusetts Department of Conservation and Recreation (DCR)	<ul style="list-style-type: none"> ➤ Coordination/approval for crosswalk marking improvements and signal coordination in proximity to DCR property
Massachusetts Water Resources Authority (MWRA)	<ul style="list-style-type: none"> ➤ Direct Connect Permit for sewer connections ➤ Compliance with MWRA NPDES permit for stormwater discharges through the Combined Sewer Overflow (CSO) system (Somerville CSO areas only) ➤ Section 61 Finding ➤ 8(m) Permit
Massachusetts Historical Commission (MHC)	<ul style="list-style-type: none"> ➤ Review project for impacts to historic and archeological properties and approval for compliance with Massachusetts General Law (M.G.L.) Chapter 9, Sections 26-27C ➤ Memorandum of Agreement (with the FTA, MassDOT, and MBTA) ➤ Section 61 Finding
City of Medford	<ul style="list-style-type: none"> ➤ Approval of temporary closings/detours associated with bridge reconstruction ➤ Building/sewer permits as needed for station construction ➤ Approval for intersection and signal modifications, as appropriate ➤ Stormwater permit, as needed ➤ Street opening permits, as needed
City of Somerville	<ul style="list-style-type: none"> ➤ Approval of temporary closings/detours associated with bridge reconstruction ➤ Building/sewer permits as needed for station construction and maintenance facility ➤ Approval for intersection and signal modifications, as appropriate ➤ Stormwater permit, as needed ➤ Street opening permits, as needed
City of Cambridge	<ul style="list-style-type: none"> ➤ Building/sewer permits as needed for station construction ➤ Approval for intersection and signal modifications, as appropriate ➤ Stormwater permit, as needed ➤ Street opening permits, as needed