



## BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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Stephanie Pollack, MassDOT Secretary and CEO and MPO Chair  
Tegin L. Teich, Executive Director, MPO Staff

### *WORK PROGRAM*

## SILVER LINE EXTENSION ALTERNATIVES ANALYSIS

AUGUST 6, 2020

### Proposed Motion

The Boston Region Metropolitan Planning Organization (MPO) votes to approve this work program.

### Project Identification

Unified Planning Work Program (UPWP) Classification

Agency and Other Client Transportation Planning Studies and Technical Analyses

Project Number 11495

#### Client

Massachusetts Department of Transportation (MassDOT), Office of Transportation Planning

*Client Supervisor:* Doug Johnson

#### Project Supervisors

*Principal:* Marty Milkovits

*Manager:* Bruce Kaplan

#### Funding Source

MassDOT Contract—Massachusetts Bay Transportation Authority (MBTA) Bond Funds

### Schedule and Budget

Schedule: 12 months from notice to proceed

Budget: \$115,000

Schedule and budget details are shown in Exhibits 1 and 2, respectively.

### Relationship to MPO Work

This study is supported in full with non-MPO funding. Committing MPO staff to this project will not impinge on the quality or timeliness of MPO-funded work.

## Background

Everett, a small, densely populated city located across the Mystic River from Boston, has historically been a working-class community, and home to significant industrial manufacturing. Recently, the city began a process of revitalization by attracting new, or expanding existing, industrial and business opportunities (including Encore Casino), remediating brownfields, enhancing residential quality of life, and improving waterfront access. Everett and its neighboring communities have experienced rapid population and employment changes, and further expansion is anticipated. The massive changes associated with such development present the challenge of creating a balanced and integrated multimodal transportation system that provides sufficient access to job centers and resources across Greater Boston.

In 2018, the MBTA extended Silver Line Bus Rapid Transit service from South Station in Boston to Chelsea, a community adjacent to Everett, as a way to begin addressing the needs of this part of the metropolitan region. Further extension of the Silver Line has been explored in recent MassDOT studies. In 2016, MassDOT's Everett Transit Action Plan identified the extension of the Silver Line into Everett as a part of its package of recommendations. In 2019, the Lower Mystic Regional Working Group issued recommendations for further study, and for improving transportation and mobility in the Sullivan Square area, including two differing extensions of the Silver Line from Chelsea through Everett to North Station in Boston.

Building off of the work of the Everett Transit Action Plan and the Lower Mystic Regional Working Group, the Silver Line Extension Alternatives Analysis will assess the feasibility, utility, and cost of various alignment and service frequency options of an extension of the Silver Line from Chelsea through Everett to Glendale Square, and on to Sullivan Square, North Station, Lechmere or Kendall Square. The analysis will include the development of conceptual designs for alternatives, and modeling how the alternatives would interact with other existing services, parking, and transportation demand management policies.<sup>1</sup>

MassDOT is in the process of finalizing a project team for this study. Central Transportation Planning Staff (CTPS) will be working with this team to provide technical assistance, chiefly travel demand modeling and forecasting, in this planning endeavor.

## Objective(s)

The major objectives for CTPS are as follows:

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<sup>1</sup> MassDOT, [Silver Line Alternatives Analysis RFP](#), 2020.

1. Provide modeling support to the project team to examine and evaluate proposed extensions of the Silver Line from Chelsea through Everett to North Station and Kendall Square.
2. Work with the project team to refine improvements to the scenarios and develop metrics that will be informative to the team and stakeholders.
3. Coordinate with the project team.

## Work Description

The seven tasks in this work program are described below.

### Task 1 Coordinate with Project Team

Staff will provide support to the project team. In the event of project delays beyond the control of CTPS, the timing of project deliverables will be consistent with a revised schedule developed in collaboration with the project team.

#### *Products of Task 1*

- Coordination with the project team
- Attendance at as many as 10 internal meetings
- Attendance at as many as two external meetings
- Document review

### Task 2 Perform Base-Year Model Calibration for the Study Area

This task consists of refining and enhancing the Boston Region MPO's regional travel demand model set for the current and proposed Silver Line area and Rutherford Avenue corridor. Staff will pay particular attention to replicating existing conditions for the study area's transit and roadway networks, and will compile available study-area transit and roadway counts, including those related to Logan Airport. The results of running the base-year model will be summarized in sufficient detail to provide systemwide transit and study-area-specific transit data, such as daily boardings, alightings, and access-mode shares at nearby rapid transit and commuter rail stations, and boardings on certain bus routes, particularly during the AM peak period (6:00 to 9:00 AM) and the PM peak period (3:00 to 6:00 PM). Roadway volume data approaching the defined set study area intersections will also be provided.

#### *Products of Task 2*

- A multimodal travel demand model set calibrated to the study area
- Graphic and tabular summaries of relevant roadway, nonmotorized, and transit data, including analyses of volume-to-capacity ratios and peak loads

### Task 3 Model the 2040 No-Build Scenario

Staff will develop the 2040 no-build scenario based on the most recent demographic assumptions and multimodal transportation networks in the Boston Region MPO's Long-Range Transportation Plan and consultation with the project team. The regional travel demand model set's mode choice and assignment components will be used to prepare the same categories of estimated traffic and transit volumes for this scenario that were generated in Task 2 for the base year, so that the base-year and no-build scenarios can be compared.

#### *Products of Task 3*

- 2040 no-build scenario
- Graphic and tabular summaries of relevant roadway, non-motorized, and transit data, including analyses of volume-to-capacity ratios and peak loads

### Task 4 Model Silver Line Extension Scenarios and Analyze Results

Based on input from the project team, staff will model up to six distinct Silver Line Extension scenarios and will summarize the results in the same fashion as in Task 3, so that they can be compared with each other, and the base-year and no-build scenarios. These scenarios will each use the same 2040 trip table produced by the regional travel demand model set's trip generation and trip distribution model routines in Task 3.

#### *Products of Task 4*

- Silver Line Extension scenarios
- Graphic and tabular summaries of relevant roadway, non-motorized, and transit data, including analyses of volume-to-capacity ratios and peak loads

### Task 5 Perform Air Quality Analyses

CTPS will work in coordination with the project team on air quality analyses. The air quality analyses, building on the model outputs of Tasks 3 and 4, will estimate mobile emissions from cars, trucks, and transit vehicles of carbon monoxide, carbon dioxide, nitrogen oxides, volatile organic compounds, and particulate matter.

#### *Product of Task 5*

Tabular summaries of emissions

### Task 6 Perform Environmental Justice Analyses

CTPS will conduct environmental justice analyses for the proposed Silver Line Extension scenarios. After identifying communities of concern, specified performance measures (accessibility to health care, higher education, and jobs; mobility and congestion; and environmental impacts) will be used as indicators of benefits and burdens for environmental justice and non-environmental justice communities.

*Product of Task 6*

Tabular summaries of the results of the environmental justice analyses

**Task 7 Document Methodology and Results**

CTPS staff will produce a memorandum that will summarize the methodology and findings of the project. Staff will also assist the project team with products connected to the modeling results.

*Product of Task 7*

Brief memorandum documenting the project's methodology and results

The Boston Region Metropolitan Planning Organization (MPO) operates its programs, services, and activities in compliance with federal nondiscrimination laws including Title VI of the Civil Rights Act of 1964 (Title VI), the Civil Rights Restoration Act of 1987, and related statutes and regulations. Title VI prohibits discrimination in federally assisted programs and requires that no person in the United States of America shall, on the grounds of race, color, or national origin (including limited English proficiency), be excluded from participation in, denied the benefits of, or be otherwise subjected to discrimination under any program or activity that receives federal assistance. Related federal nondiscrimination laws administered by the Federal Highway Administration, Federal Transit Administration, or both, prohibit discrimination on the basis of age, sex, and disability. The Boston Region MPO considers these protected populations in its Title VI Programs, consistent with federal interpretation and administration. In addition, the Boston Region MPO provides meaningful access to its programs, services, and activities to individuals with limited English proficiency, in compliance with U.S. Department of Transportation policy and guidance on federal Executive Order 13166.

The Boston Region MPO also complies with the Massachusetts Public Accommodation Law, M.G.L. c 272 sections 92a, 98, 98a, which prohibits making any distinction, discrimination, or restriction in admission to, or treatment in a place of public accommodation based on race, color, religious creed, national origin, sex, sexual orientation, disability, or ancestry. Likewise, the Boston Region MPO complies with the Governor's Executive Order 526, section 4, which requires that all programs, activities, and services provided, performed, licensed, chartered, funded, regulated, or contracted for by the state shall be conducted without unlawful discrimination based on race, color, age, gender, ethnicity, sexual orientation, gender identity or expression, religion, creed, ancestry, national origin, disability, veteran's status (including Vietnam-era veterans), or background.

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Title VI Specialist  
Boston Region MPO  
10 Park Plaza, Suite 2150  
Boston, MA 02116  
[civilrights@ctps.org](mailto:civilrights@ctps.org)  
857.702.3700 (voice)  
617.570.9193 (TTY)

**Exhibit 1**  
**ESTIMATED SCHEDULE**  
**Silver Line Extension Alternatives Analyses**

Task	Month											
	1	2	3	4	5	6	7	8	9	10	11	12
1. Coordinate with Project Team	[Task duration bar from Month 1 to 12]											
2. Perform Base-Year Model Calibration for the Study Area	[Task duration bar from Month 2 to 4]											
3. Model the 2040 No-Build Scenario	[Task duration bar from Month 3 to 6]											
4. Model Silver Line Extension Scenarios and Analyze Results						[Task duration bar from Month 6 to 11]						
5. Perform Air Quality Analyses											[Task duration bar from Month 11 to 12]	
6. Perform Environmental Justice Analyses											[Task duration bar from Month 11 to 12]	
7. Document Methodology and Results									[Task duration bar from Month 9 to 12]			

**Exhibit 2**  
**ESTIMATED COST**  
**Silver Line Extension Alternatives Analyses**

<b>Direct Salary and Overhead</b>	<b>\$115,000</b>
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Task	Person-Weeks				Direct Salary	Overhead (106%)	Total Cost
	M-1	P-5	P-2	Total			
1. Coordinate with Project Team	1.0	2.0	0.0	3.0	\$5,833	\$6,183	\$12,015
2. Perform Base-Year Model Calibration for the Study Area	0.2	4.0	0.0	4.2	\$8,318	\$8,817	\$17,135
3. Model the 2040 No-Build Scenario	0.2	2.0	0.0	2.2	\$4,345	\$4,606	\$8,951
4. Model Silver Line Extension Scenarios and Analyze Results	0.2	12.0	0.0	12.2	\$24,210	\$25,663	\$49,873
5. Perform Air Quality Analyses	0.2	0.7	0.0	0.9	\$1,766	\$1,872	\$3,638
6. Perform Environmental Justice Analyses	1.0	0.4	2.0	3.4	\$4,885	\$5,178	\$10,063
7. Document Methodology and Results	1.0	2.3	0.0	3.3	\$6,468	\$6,856	\$13,325
Total	3.8	23.4	2.0	29.2	\$55,825	\$59,175	\$115,000

<b>Other Direct Costs</b>	<b>\$0</b>
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<b>TOTAL COST</b>	<b>\$115,000</b>
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**Funding**  
 MassDOT MBTA Bonds