



## 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***

## **SERVICE EQUITY AND ENVIRONMENTAL ANALYSES FOR STATE FISCAL YEAR 2022 MBTA SERVICE CHANGES**

OCTOBER 15, 2020

### **Proposed Motion**

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

### **Project Identification**

#### **Unified Planning Work Program (UPWP) Classification**

Not listed in Federal Fiscal Year (FFY) 2021 UPWP

**Project Number** 11427

#### **Client**

Massachusetts Bay Transportation Authority (MBTA)

*Client Supervisor: Melissa Dullea*

#### **Project Supervisors**

*Principal: Paul Christner*

*Manager: Steven Andrews*

#### **Funding Source**

Future MBTA Contract

### **Schedule and Budget**

**Schedule:** Five months from notice to proceed

**Budget:** \$66,500

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

The MBTA has experienced a significant decline in ridership as a result of the COVID-19 pandemic, and is currently projecting a budget deficit of \$308 million to \$577 million in state fiscal year (SFY) 2022. In light of the projected deficit, the MBTA must plan for significant service reductions effective July 1, 2021. These service changes are expected to exceed the MBTA's major service change threshold, which the MBTA defines at the modal level and at the route level. At the modal level, a major service change is defined as "a change in Revenue Vehicle Hours (RVH) per week of at least 10% by mode." At the route level, a major service change is defined as "a change in route length of at least 25% or three miles, or for routes with at least 80 RVH per week, a change in RVH per week of at least 25%."

As a recipient of federal funds through the Federal Transit Administration (FTA), the MBTA is required to comply with Title VI of the Civil Rights Act of 1964 (49 CFR 21). The FTA provides guidance to its subrecipients for carrying out Title VI obligations in Circular 4702.1B. This circular includes a requirement for large transit providers to conduct a Title VI service equity analysis to evaluate, prior to implementing any major service change, whether the planned change would have a discriminatory impact on the basis of race, color, or national origin. Although low-income populations are not a protected class under Title VI, the FTA also requires transit providers to determine whether low-income populations would bear a disproportionate burden (or if non-low-income populations would receive a disproportionate benefit) from a proposed major service change. Traditionally, the Central Transportation Planning Staff (CTPS) of the Boston Region MPO has conducted all required service equity analyses for the MBTA.

Massachusetts General Law, Part I, Title XXII, Chapter 161A, Section 5 describes the limitations, conditions, obligations and duties of the MBTA. Part (d) of this section requires the MBTA, prior to a decrease in service of 10 percent or more, to

- 1) hold one or more public meetings about the proposed changes;
- 2) have the MBTA Advisory Board review the proposed changes; and
- 3) complete an environmental notification form (ENF) that includes an evaluation of the potential environmental impacts.

The MBTA has requested that CTPS conduct an environmental analysis to support the ENF.

## Objectives

The objectives of this work are to support the MBTA in conducting the required Title VI service equity analysis and environmental analysis for planned SFY 2022 service changes.

## Work Description

The work required to accomplish the project's objectives will be carried out in the four tasks described below:

### **Task 1 Conduct Service Equity Analysis for the SFY 2022 Service Changes**

CTPS will conduct a service equity analysis for the planned SFY 2022 service changes, anticipated to be approved by the MBTA Fiscal Management and Control Board in December 2020, and implemented July 1, 2021. Typically, the analysis compares existing service to service after the proposed changes have been implemented. However, the MBTA has implemented a number of interim service changes in response to changing ridership levels related to the COVID-19 pandemic. CTPS will work with the MBTA and FTA to determine the particular data and methodology to be used for quantifying the impacts of the service changes.

Should FTA approve the use of census data for the equity analysis, CTPS will use its Modified Transit Opportunity Index (MTOI). The MTOI metric comprises three components (access opportunity, trip opportunity, and temporal comparability) that combine to measure the degree of transit service provided to a population. MTOI is used by defining the impacts of a potential service change as the overall increase or decrease in the MTOI metric for each population within the service area. This methodology improves on the procedures provided by FTA by, 1) identifying a more comprehensive set of the population impacted by a service change; 2) quantifying impacts in relation to the magnitude of the change in service; and 3) accounting for reasonable alternative transit options that mitigate the overall impact of the service change. CTPS will use General Transit Feed Specification (also known as GTFS) files provided by the MBTA's Service Planning Department as inputs for the analysis.

CTPS will apply the MBTA's Disparate Impact and Disproportionate Burden Policy to the quantified impacts of the service changes to evaluate whether they may result in disparate impacts on minority populations and/or disproportionate burdens on low-income populations.

#### ***Products of Task 1***

Results of the service equity analysis

### **Task 2 Document Results of Service Equity Analysis**

CTPS will provide the MBTA's Service Planning Department and MassDOT's Office of Diversity and Civil Rights with documentation of the service equity analysis in a technical memorandum, along with technical support for publishing and presenting the results.

***Products of Task 2***

Technical memorandum documenting the service equity analysis for the SFY 2022 service changes

**Task 3 Conduct Environmental Analysis for the SFY 2022 Service Changes**

The environmental analysis will consist of forecasting changes in vehicular and transit emissions of ozone precursors (Volatile Organic Compounds and Oxides of Nitrogen), Carbon Monoxide, and Carbon Dioxide as a proxy for greenhouse gases that might result from the changes to MBTA service. The study area will include the MBTA service area that covers 175 communities in eastern Massachusetts. The analysis will compare the September 2020 level of transit service and ridership to the proposed SFY 2022 proposed level of service and estimated ridership. The analysis will focus on an average weekday by time period. The analysis will use data provided by the MBTA on the percentage reductions in service for each route, line, and mode at the daily or time period level.

***SFY 2020 Base Line Emissions***

The automotive emissions will be estimated using the latest MOVES emission model factors linked to estimates of vehicle-miles-traveled (VMT) and congested speeds derived from several recent sources of travel data on roadway use, such as INRIX, Streetlight, and the CTPS travel demand model for an average weekday in the MBTA service area (scaled to reflect the impact of the COVID-19 pandemic). MOVES is the Environmental Protection Agency's (EPA) Motor Vehicle Emission Simulator, an emission modeling system that estimates mobile source emissions for criteria air pollutants and greenhouse gases.

CTPS will estimate the transit vehicle emissions using guidance from FTA and the EPA by mode. CTPS will produce an inventory of emissions for SFY 2020 using fuel use and transit VMT information from the MBTA for the MBTA service area on an average weekday in the fall of 2020.

***SFY 2022 Proposed Service Plan***

The automotive emissions will pivot off of the SFY 2020 estimates, which will be adjusted to account for changes in automobile use, VMT, and congested speeds due to the changes in service levels associated with the proposed service plan. Staff will apply elasticities to SFY 2020 ridership to determine possible shifts in modal use and consider changes to telecommuting that may result from changes to the transit system. These shifts will be analyzed geographically to better understand where the service changes are impacting VMT and congested speeds, which will result in changes to the automotive emissions.

The transit emissions for the proposed service plan will pivot off of the SFY 2020 estimates, which will be adjusted using the most detailed service plan information available on each mode, route, and frequency.

***Products of Task 3***

Forecasts of emission changes resulting from the proposed SFY 2022 service plan for all nonpoint source transportation modes by geography

**Task 4 Document Results of Environmental Analysis**

CTPS will provide the MBTA's Environmental Affairs Department with documentation of the environmental analysis in a technical memorandum.

***Product of Task 4***

Technical memorandum documenting the environmental analysis

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.

A complaint form and additional information can be obtained by contacting the MPO or at [http://www.bostonmpo.org/mpo\\_non\\_discrimination](http://www.bostonmpo.org/mpo_non_discrimination). To request this information in a different language or in an accessible format, please contact

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**

**Service Equity and Environmental Analyses for State Fiscal Year 2022 MBTA Service Changes**

Task	Month				
	1	2	3	4	5
1. Conduct Service Equity Analysis for the SFY 2022 Service Changes					
2. Document Results of Service Equity Analysis					A
3. Conduct Environmental Analysis for the SFY 2022 Service Changes					
4. Document Results of Environmental Analysis					B

Products/Milestones

A: Technical memorandum no. 1

B: Technical memorandum no. 2

**Exhibit 2**  
**ESTIMATED COST**  
**Service Equity and Environmental Analyses for State Fiscal Year 2022 MBTA Service Changes**

<b>Direct Salary and Overhead</b>	<b>\$66,500</b>
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Task	Person-Weeks						Direct Salary	Overhead (106%)	Total Cost
	M-1	P-5	P-4	P-3	P-2	Total			
1. Conduct Service Equity Analysis for the SFY 2022 Service Changes	2.6	3.6	0.0	0.0	2.2	8.4	\$12,916	\$13,691	\$26,608
2. Document Results of Service Equity Analysis	1.4	1.0	0.0	0.0	1.0	3.4	\$5,045	\$5,347	\$10,392
3. Conduct Environmental Analysis for the SFY 2022 Service Changes	0.9	2.0	0.0	1.2	4.0	8.1	\$11,873	\$12,586	\$24,459
4. Document Results of Environmental Analysis	0.1	0.8	0.4	0.0	0.1	1.4	\$2,447	\$2,594	\$5,041
Total	5.0	7.4	0.4	1.2	7.3	21.3	\$32,281	\$34,218	\$66,500

<b>Other Direct Costs</b>	<b>\$0</b>
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<b>TOTAL COST</b>	<b>\$66,500</b>
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**Funding**  
 Future MBTA Contract