



## BOSTON REGION METROPOLITAN PLANNING ORGANIZATION

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Stephanie Pollack, MassDOT Secretary and CEO and MPO Chair  
Karl H. Quackenbush, Executive Director, MPO Staff

### *WORK PROGRAM*

## SERVICE EQUITY ANALYSIS SUPPORT TO THE MBTA

APRIL 12, 2018

### Proposed Motion

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

### Project Identification

Not listed in federal fiscal year (FFY) 2018 Unified Planning Work Program (UPWP)

Project Number 14358

#### Client

Massachusetts Bay Transportation Authority (MBTA)

*Client Supervisor:* Melissa Dullea

#### Project Supervisors

*Principal:* Katie Pincus

*Manager:* Steven Andrews

#### Funding Source

MBTA Contract

### Schedule and Budget

**Schedule:** 28 months from notice to proceed

**Budget:** \$115,000

Schedule and budget details are shown in Exhibits 1 and 2, respectively. This budget was developed using a billing overhead rate of 105.66 percent as approved by the Boston Region MPO for state fiscal year (SFY) 2018. On each consecutive July 1, beginning with July 1, 2018, the overhead rate will be adjusted to reflect the SFY rate approved by the MPO.

### 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, as a recipient of federal funds through the Federal Transit Administration (FTA), 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 their 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. Currently, the MBTA is undertaking a systemwide bus service planning process, which is expected to include a set of changes that exceed the MBTA's major service change threshold, therefore requiring a service equity analysis. Furthermore, the MBTA envisions the need for additional service equity analyses for service changes that might occur outside of the bus service plan.

## Objective

The objective of this work is to support the MBTA in conducting the required Title VI service equity analyses for major service changes. The MBTA defines a major service change 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%." The specific service equity analyses to be conducted have yet to be determined, but will include the MBTA's set of proposed service changes for developing its bus service plan, the Better Bus Project, and as many as two other major service changes that occur during the time period and within the budget constraint specified by this work scope.

## Work Description

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

## Task 1 Provide General Service Equity Analysis Support

During the period specified by this work scope, CTPS will conduct as many as two service equity analyses for major service changes that occur outside of the MBTA Better Bus Project.

### *Subtask 1.1 Conduct Service Equity Analyses*

CTPS will conduct service equity analyses for as many as two major service changes. The specific scope and time frame for conducting each of these analyses will be determined once the MBTA provides the required information about the proposed service changes, and will depend upon CTPS's availability at that time. Service equity analyses require different levels of effort depending on the type and magnitude of service change. For example, we estimate that analysis of a major service change to a single route would cost as much as \$20,000; and analysis of a major service change that spreads across a significant portion of the MBTA network would cost as much as \$30,000. These estimates do not include the cost of conducting any field counts or surveys.

CTPS will conduct each service equity analysis using methods for quantifying the impacts of the service change that extend beyond the procedures provided by FTA in Circular 4702.1B. CTPS will work with the MBTA to determine the particular methodology that will be used for quantifying the impacts of the service changes based on the timing of the request to conduct the analysis. With the support of the MBTA and its Office of Diversity and Civil Rights (ODCR) under a separate contract, CTPS is currently building a tool for conducting service equity analyses using its Modified Transit Opportunity Index (MTOI). The MTOI metric is comprised of three components (access opportunity, trip opportunity, and temporal comparability) that combine to measure the degree of transit service provided to a population. MTOI is utilized 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 upon 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. Should the work under the aforementioned contract be completed before the request to conduct the analyses, CTPS will use its fully developed MTOI procedure. Otherwise, CTPS will work with the MBTA to develop and apply an alternate methodology that would utilize aspects of the access opportunity and trip opportunity components of MTOI, which account for the geographic proximity to transit services and the number of transit trips provided. CTPS will use General Transit Feed Specification (GTFS) files provided by the MBTA's Service Planning Department as inputs for the analyses.

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

*Subtask 1.2 Document Results of Service Equity Analyses*

CTPS will provide the MBTA's Service Planning Department and ODCR with the results of each service equity analysis in a technical memorandum, along with technical support for publishing and presenting the results.

*Products of Task 1*

Technical memoranda documenting service equity analyses for each major service change that occurs outside of the MBTA Better Bus Project

**Task 2 Conduct Service Equity Analyses for the MBTA Better Bus Project**

The MBTA is undertaking a three-tiered approach to developing its next bus service plan, the Better Bus Project. Each tier will provide broad recommendations for improving MBTA bus service at a different cost level. Staff from the MBTA's Service Planning Department project that the MBTA's Fiscal and Management Control Board (FMCB) will vote to implement one of the three tiers in December 2018.

Once the FMCB has selected a tier, MBTA Service Planning staff will produce a first draft of its Better Bus Project. CTPS will work with staff from MBTA Service Planning and MassDOT's Office of Diversity and Civil Rights to conduct a service equity analysis for the first draft. The Better Bus Project is expected to cycle through a sequence of revisions based on feedback from the FMCB and members of the public, until a final plan is voted on and approved by the FMCB. In addition to the equity analysis for the initial draft, CTPS will conduct service equity analyses for as many as three revisions of the Better Bus Project, as directed by the MBTA.

*Subtask 2.1 Conduct Service Equity Analyses*

Once the MBTA provides the required information about the service changes resulting from the Better Bus Project, CTPS will conduct an equity analysis for the aggregate service changes included in the plan.

As with the other equity analyses specified in this scope, CTPS will use its fully developed MTOI procedure if the tool is completed in time to be used for the required analysis. Otherwise, CTPS will apply the methodology described in Task 1 that would utilize aspects of the access opportunity and trip opportunity components of MTOI. CTPS will conduct additional service equity analyses for as many as three subsequent revisions to the service plan, as directed by the MBTA. The level of effort required for conducting each additional service equity analysis, and therefore the number of analyses that CTPS can complete within

this work scope and budget, depends upon the number and magnitude of changes presented in each revision.

*Subtask 2.2 Document Results of Service Equity Analyses*

CTPS will provide MBTA Service Planning and ODCR with results of the service equity analyses, along with technical support for publishing and presenting the results. CTPS will prepare a technical memorandum documenting the final equity analysis results.

*Product of Task 2*

Technical memorandum documenting the final service equity analysis for the MBTA's Better Bus Project

**Exhibit 1**  
**ESTIMATED SCHEDULE**  
**Service Equity Analysis Support to the MBTA**

Task	Quarter								
	1	2	3	4	5	6	7	8	9
1. Provide General Service Equity Analysis Support									
2. Conduct Service Equity Analyses for the Better Bus Project									

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**Exhibit 2**  
**ESTIMATED COST**  
**Service Equity Analysis Support to the MBTA**

<b>Direct Salary and Overhead</b>	<b>\$115,000</b>
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Task	Person-Weeks				Direct Salary	Overhead (105.66%)	Total Cost
	M-1	P-5	P-4	Total			
1. Provide General Service Equity Analysis Support	3.0	3.0	9.4	15.4	\$24,312	\$25,688	\$50,000
2. Conduct Service Equity Analyses for the Better Bus Project	3.9	4.0	12.0	19.9	\$31,605	\$33,394	\$64,999
Total	6.9	7.0	21.4	35.3	\$55,917	\$59,082	\$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**  
 MBTA Contract